ANNAMACHARYA UNIVERSITY

EXCELLENCE IN EDUCATION; SERVICE TO SOCIETY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

RAJAMPET, Annamayya District, A.P – 516126, INDIA.

RESEARCH & DEVELOPMENT CELL

Department wise Paper Presented / Published in Proceedings of the Conference – 2024-25

Departments	CE	EEE	MECH	ECE	CSE	AI &DS	AIML	H & S	MBA	MCA	Total
No.of Papers Published in Conference	4	32	0	50	18	20	0	2	1	0	**127**

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

CONSOLIDATED REPORT OF R&D ACTIVITIES

List of Conference Papers published by the faculty during- 2024-25

Department of Civil Engineering

S.No	Name of the Author(s)	Department of the Author(s)	Title of the paper	Name of the Journal	Name of the organiser	Place of the organiser	Page Numbers (Ex: 102-110)	Day of publication	Month of publication	Year of publication	National	International	ISSN / ISBN	ICI / UGC Care	Scopus	SCI	Web of Science (SCIE / ESCI)	Other	Journal link (DOI)	Link to the notification in UGC enlistment of the Journal	Link to the notification in Scopus enlistment of the Journal	Link to the notification in WoS enlistment of the Journal
1	A Suresh Kumar, A Balavivekanandhan, Mohammed Saleh Al Ansari, P N V Syamala Rao M, D Gouse Peera, S Muthuperumal	Civil Engineering	Innovations in Media C: Federated Learning and BiLSTM Integration for Image and Video Analysis	IEEE	Electrical, Electronics, Information and Communication Technologies (ICEEICT), IEEE	Trichirappalli, India	1 to 7	24–26	July	2024		International	YES	ISBN: 979-8-3503-6908-3		YES	-	-	-	https://ieeexplore.ieee.org/document/10718408	-	-
2	SiripiReddy Venkateswarlu Reddy, O. Hemakesavulu, CH. Hussaian Basha, M. Mujahid Irfan, Daruru Sarika, Dudekula Gouse Peera	Civil Engineering	An Enhanced Repetitive Control Framework for Adaptive Neuro-Fuzzy Learning Grid-Connected Inverter with Current Control and Frequency Adaptability	IEEE	Trends in Electrical, Electronics, Computer Engineering Conference (TEECON), IEEE	Bangalore, India	240–244	07–08	November	2024		International	YES	ISBN: 979-8-3315-0571-4		YES	-	-	-	https://ieeexplore.ieee.org/document/10939415	-	-
3	S D Prabu Ragavendiran, NR Gowthami, Gayathri C, D. Ramya, D. Padmapriya, S.V. Suji Aparna	Civil Engineering	A Novel Dual Temporal Channel Convolutional Network with Exponential Distribution Optimizer for Satellite Image Classification with Google Earth Engine	IEEE	Ubiquitous Computing and Intelligent Information Systems (ICUIS), IEEE	Gobichettipalayam, India		12–13	December	2024			YES	ISBN: 979-8-3315-2963-5		YES	-	-	-	https://ieeexplore.ieee.org/abstract/document/10866210	-	-
4	Fahimuddin Shaik, Shaik Karimullah, Kumbala Pradeep Reddy, N R Gowthami	Civil Engineering	Optimizing Image Quality and Information Content with NSCT - PCNN Fusion for Medical and Remote Sensing Image	IEEE	Intelligent Systems and Machine Learning Conference (ISML), IEEE	Hyderabad, India	504–508	04–052024	May	2024			YES	ISBN: 979-8-3503-4387-8		YES	-	-	-	https://ieeexplore.ieee.org/document/11007432	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

List of Conferences Published by the faculty during- 2024-25

Department of EEE

S.No	Name of the Author(s)	Dept. of Authors	Title of the paper	Name of the Journal	Vol.	Issue	Page Numbers (Ex: 102-110)	Date of publication	Month of publication	Year of publication	National	International	ISSN / ISBN	ICI / UGC Care	Scopus	SCI	Web of Science (SCIE / ESCI)	Other	Journal link (DOI)
1	Vanidha Suresh, T. Logasundari, V. Shanmukha Sravani, Muqthiar Ali, Suresh Srinivasan	EEE	IOT Based Automated Indoor Hydroponic Farming System	E3S Web of Conference	547	...	1-8	9	Jul.	2024	...	International	2267-1242	...	Scopus	...	...	...	https://doi.org/10.1051/e3sconf/202454702002
2	Devakirubakaran S, Karpaga Priya R, Dhananjaya Babu K, Koganti Srilakshmi, Deepak M	EEE	Mitigating Partial Shading Effects in Photovoltaic System using Intelligent Current Compensation Method	E3S Web of Conference	547	...	1-8	9	Jul.	2024	...	International	2267-1242	...	Scopus	...	...	...	https://doi.org/10.1051/e3sconf/202454702001
3	S. Vasiha Anjum, S. Mallikarjunaiah, G. Balakrishna, Aruna Bonasi and Ramesh Matham	EEE	Efficient power system operation through fuzzy and PSO algorithm for power loss reductions and voltage profile	E3S Web of Conference	547	...	...	9	Jul.	2024	...	International	2267-1242	...	Scopus	...	...	...	https://doi.org/10.1051/e3sconf/202454701011
4	B.V. Sai Thrinath, B. Lakshmi Prasanna, John Powl S, N. Sreeramula Reddy, Nagalingachary K and P. Ponmurugan	EEE	Real time monitoring and analysis of string faults in solar plants using IoT	E3S Web of Conference	547	...	...	9	Jul.	2024	...	International	2267-1242	...	Scopus	...	...	...	https://doi.org/10.1051/e3sconf/202454701011
5	S. Vasiha Anjum, V. Suryanarayanareddy, Mall ela Leela Mounika, Nellore Yamini and M. Sai Sandeep	EEE	Enhancing Power Quality in Integrated PV Systems and DFIG Systems through MPPT and Fuzzy Logic Controller for Grid Systems	E3S Web of Conference	547	...	...	9	Jul.	2024	...	International	2267-1242	...	Scopus	...	...	...	https://doi.org/10.1051/e3sconf/202454701011
6	S. Farook; B.V. Sai Thrinath; K Nagalingachary.; V Bhargavi Boyinasetty; S. Jayakumar; Boothapati Anil Kumar	EEE	Advanced Power Quality in Hybrid PV-Wind Systems with TSK Fuzzy Control	IEEE Xplore	...	...	1-5	22	Aug.	2024	...	International	979-8-3503-8269-3	...	Scopus	...	...	...	https://doi.org/10.1109/ICITEICS61368.2024.10625248.
7	Ch. Naga Sai Kalyan, Pasala Gopi, Priyanka Joshi, T. Hima Bindu, Mohit Bajaj	EEE	Fruit Fly Algorithm Optimised De gree of Freedom Controller for the Dynamical Stability of the Renewable Energy Penetrated Multi Area Power Sy stem	E3S Web of Conference	...	...	1-7	6	Sep.	2024	...	International	2267-1242	...	Scopus	...	...	...	https://doi.org/10.1051/e3sconf/202456401001

S.No	Name of the Author(s)	Dept. of Authors	Title of the paper	Name of the Journal	Vol.	Issue	Page Numbers (Ex: 102-110)	Date of publication	Month of publication	Year of publication	National	International	ISSN / ISBN	ICI / UGC Care	Scopus	SCI	Web of Science (SCIE / ESCI)	Other	Journal link (DOI)
8	Ch. Naga Sai Kalyan, Pasala Gopi, Govind Singh Jethi, Priyanka Joshi, T. Hima Bindu, Mohit Bajaj	EEE	Water Cycle Algorithm Tuned Cascade Controller for the Frequency Control of a Nonlinear Hydrothermal Power System with PEV Integration	E3S Web of Conference	...	...	1-6	6	Sep.	2024	...	International	2267-1242	...	Scopus	...	...	...	https://doi.org/10.1051/e3sconf/202456406002
9	K. Shalini; K. Harinath Reddy; Kondalarao Punati; Kavin K. S.; P. Veena; K. Pushpalatha	EEE	An Efficient Shortest Path Optimized Algorithm For Vehicle Adhoc Networks System	IEEE Xplore	...	...	1423-1427	16	Sep.	2024	...	International	979-8-3503-7281-6	...	Scopus	...	...	...	https://doi.org/10.1109/ICCPCT61902.2024.10673088
10	M. Bala Siva Prasad, P. Bala Chennaiah	EEE	Power Management and Control for PV Integrated Microgrid with Battery Energy Storage System	IEEE Xplore	...	...	1-6	2	Oct	2024	...	International	2996-5349	...	Scopus	...	...	...	https://doi.org/10.1109/ICESC60852.2024.10689777
11	Praveen Kumar Reddy K; Balachennaiah Pagidi	EEE	Multi Agent System Based Control for Energy Management of Hybrid Microgrid System	IEEE Xplore	...	...	...	8	Oct	2024	...	International	979-8-3503-8706-3	...	Scopus	...	...	...	https://doi.org/10.1109/ICETCI62771.2024.10704112
12	Daruru Sarika; Palepu Suresh Babu; Potladurthy Suresh Babu; Pasala Gopi; S. Venkateswarlu; P.B. Chennaiah	EEE	Facial Sentiment Analysis: Enhancing Emotion Recognition Through Advanced Convolutional Neural Network Architectures	IEEE Xplore	...	...	1-5	30	Oct.	2024	...	International	979-8-3503-7651-7	...	Scopus	...	...	...	https://doi.org/10.1109/ICICEC62498.2024.10808546
13	P. D. Moyya, K. H. Bindu, N. K. Kumar, S. V. Reddy, G. Manikanta and Rahul S. G,	EEE	Design of Transcutaneous Electrical Nerve Stimulator Machine for Chronic Low Back Pain	IEEE Xplore	...	...	7-12	14	Nov.	2024	...	International	2473-7690	...	Scopus	...	...	...	https://doi.org/10.1109/I4C62240.2024.10748423
14	S G Rahul; R Rajkumar; P Kavitha; Neelamsetti Kiran Kumar; SiripiReddy Venkateswarlu Reddy; K. Pavan Teja	EEE	An Economic IoT-driven Rural Greenhouse Control System for Optimal Plant Growth	IEEE Xplore	...	...	1-6	...	Dec.	2024	...	International	979-8-3503-5417-1	...	Scopus	...	...	...	https://doi.org/10.1109/ICONAT61936.2024.10774915
15	S. Sarada, Ganesh Challa, O. Hemakesavulu, M. Damodar Reddy, N. Ravisankara Reddy, Pagidela Yamuna	EEE	Single Phase Grid Connected Nine Level Quadruple Boost Inverter with Current Control and Active Damping Capability	IEEE Xplore	...	...	1-6	24	Dec.	2024	...	International	979-8-3503-5437-9	...	Scopus	...	...	...	https://doi.org/10.1109/ODICON62106.2024.10797554
16	Ganesh Challa, S. Sarada, D. Sarika, N. M. G. Kumar, N. Ravisankara Reddy, M. Damodar Reddy	EEE	FCS-MPC Based Grid-Tied Self-Balanced Switched Capacitor Reduced Switch Nine Level Inverter	IEEE Xplore	...	...	504-509	11	Feb.	2025	...	International	979-8-3315-0579-0	...	Scopus	...	...	...	doi: 10.1109/ICCCMLA63077.2024.10871801

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17	Meisam Mahdavi, Nahar Fehaid Alshammari, Augustine Awaafo, Francisco Jurado, Pasala Gopi	EEE	An Economic Loss Reduction Using Static VAR Compensator and Capacitor Placement in Reconfigurable and Expandable Distribution Grids With a Variable Electric Power Demand	IEEE Xplore	...	...	5585-5596	24	Feb	2025	...	International	1939-9367	...	Scopus	...	...	...	https://doi.org/10.1109/TIA.2025.3544569
18	M.Pandikumar;K.J.Jenisha; M.Baskar;Madamanchi Swathi;N.K.Rayaguru;Baskaran.S	EEE	Optimized Power Quality Enhancement in PV-Integrated UPQC Systems Using Chaotic PSO-Based MPPT Algorithm	IEEE Xplore	...	...	...	25	Feb.	2025	...	International	979-8-3503-8723-0	...	Scopus	...	...	...	https://doi.org/10.1109/AREIS62559.2024.10893654
19	Patil Mounical, R Muniraj, Gaurav Sethi, VS Anusuya Devi, Shanmuga Priyan, M. Mahesh	EEE	Management and Control of a Fuel Cell, Solar Photovoltaic, and Battery Energy Storage System Linked to a DC Nano Grid	E3S Web of Conference	...	...	1-12	12	Mar.	2025	...	International	2267-1242	...	Scopus	...	...	...	https://doi.org/10.1051/e3sconf/202561901012
20	A. Akhila; Sameera Sultana; G. Mahaboobsubahan; K. Chanthirasekaran; Medapati Sudheer Kumar Reddy	EEE	Internet of Things Based Identification of Fault in Back Channel Cable	IEEE Xplore	...	...	1-5	12	Mar.	2025	...	International	979-8-3315-4362-4	...	Scopus	...	...	...	https://doi.org/10.1109/ICSES63760.2024.10910884
21	Baya Reddy Lomada; V. Naga Bhaskar Reddy	EEE	Design and Evaluation of Bidirectional Dual-Input DC-DC Converter for Integration with Electric Vehicles	IEEE Xplore	...	...	1-5	26	Mar.	2025	...	International	979-8-3503-8866-4	...	Scopus	...	...	...	https://doi.org/10.1109/ICPEEV63032.2024.10931877.
22	Shaik Karimullah; S. Fahimuddin; R. Madhan Mohan; Muddanalali Gari Aparna; Pabbathi Geethesh; Bhumi Reddy Bhanu Teja	EEE	Optimization of Cluster Head Selection Using Bacterial Foraging Algorithm for Energy-Efficient Routing in Wireless Body Area Networks	IEEE Xplore	...	...	1-8	31	Mar.	2025	...	International	2768-0576	...	Scopus	...	...	...	https://doi.org/10.1109/ICCECE61355.2025.10940516
23	R. Roshini, S. Sendil Kumar, G. Srimathy and Shaik Mugthiar Ali	EEE	Evaluation of E-vehicle Efficiency Enhancement with Magnetic Materials	E3S Web of Conference	619				Mar.	2025		International	2267-1242	...	Scopus	...	...	...	https://doi.org/10.1051/e3sconf/202454701011
24	R. Madhan Mohan; CH. Hussain Basha; N. Deepthi; S. Venkateswarlu Reddy; M. Mujahid Irfan; O. Hemakesavulu	EEE	Prevention of Road Accidents by Using Li-Fi Technology	IEEE Xplore	...	...	1-6	1	Apr.	2025	...	International	979-8-3315-0571-4	...	Scopus	...	...	...	https://doi.org/10.1109/TEECCON64024.2024.10941302
25	S. V. Reddy, P. Gopi, C. H. Basha, M. M. Irfan, K. Shivashanker and D. Sarika	EEE	Battery Monitoring and Control System for EV using IOT Technology	IEEE Xplore	...	...	198-209	1	Apr.	2025	...	International	979-8-3315-0571-4	...	Scopus	...	...	...	https://doi.org/10.1109/TEECCON64024.2024.10939820

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26	SiripiReddy Venkateswarlu Reddy, O Hemakesavulu, CH Hussaian Basha, M Mujahid Irfan, Daruru Sarika, Dudekula Gouse Peera	EEE	An Enhanced Repetitive Control Framework for Adaptive Neuro-Fuzzy Learning Grid-Connected Inverter with Current Control and Frequency Adaptability	IEEE Xplore	...	...	240-244	1	Apr.	2025	...	International	979-8-3315-0571-4	...	Scopus	...	...	...	https://doi.org/10.1109/TEECCON64024.2024.10939415
27	Jonardan Koner; Saurabh P Joshi; Somadatta B. Karanjekar; Layth Hussein; Muhammad Saqib; Syed Rubeena Bi	EEE	Increased Technical Efficiency of Various Renewable Energy Resources in Smart Grids and Power System	IEEE Xplore	...	...	1039-1043	2	Apr.	2025	...	International	979-8-3315-1857-8	...	Scopus	...	...	...	https://doi.org/10.1109/CE2CT64011.2025.10939526.
28	P. Kalyani ; K. V. Prashanth ; R. Manivannan ; Raksha Puthran ; Shruti Jalapur ; Dhananjaya Babu K	EEE	Adaptive System for Human Scenario Forecasting in Intelligent Homes	IEEE Xplore	...	...	1076-1081	13	May	2025	...	International	979-8-3315-4158-3	...	Scopus	...	...	...	https://doi.org/10.1109/I3CEET61722.2024.10994018
29	M. S. Sujatha; Sai Pallavi Akkisetti; B. V. Sai Thrinath; Ponmurugan Panneer Selvam; Vulolla Bharath Kumar; Boothapati Anil Kumar	EEE	Implementation of Perturb & Observe, FLC and ANFIS MPPT Strategy with Buck and Boost Converters in Photovoltaic Systems	IEEE Xplore	...	...	1-5	17	Jun	2025	...	International	979-8-3315-3669-5	...	Scopus	...	...	...	https://doi.org/10.1109/ICCIES63851.2025.11033058.
30	K B Bhaskar; V Nandagopal; J Sreeranganayakulu; V Sathiyamoorthi; R Gopi; N. Sivakamasundari	EEE	Comparative Analysis of SVM, Random Forest and Reinforcement Learning for Harmonic Mitigation in Smart Homes	IEEE Xplore	...	...	604-608	24	Jun.	2024	...	International	979-8-3315-0724-4	...	Scopus	...	...	...	https://doi.org/10.1109/ICAISS61471.2025.11042016
31	B.V. Sai Thrinath; S. Farook; S. Srikanth Naik; J.V. Pavan Chand; M. Venkatesh; N. Sreeramula Reddy	EEE	Design And Implementation Of A Fuzzy Logic Based AC Line Feeder For UAV Power Systems	IEEE Xplore	...	...	1-6	27	Jun	2025	...	International	979-8-3503-9266-1	...	Scopus	...	...	...	https://doi.org/10.1109/RAEEUCCI63961.2025.11048300.
32	S. Farook; B.V. Sai Thrinath; M. Manohara; G. Tabita; M. Venkatesh; Vijaya Bhaskar K	EEE	A Fractional Controller for Load Frequency Control Tuned by Metaheuristic Algorithm	IEEE Xplore	...	...	1-6	27	Jun.	2025	...	International	979-8-3503-9266-1	...	Scopus	...	...	...	https://doi.org/10.1109/RAEEUCCI63961.2025.11048283

R & D Incharge

Head of the Department

NNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPE

CONSOLIDATED REPORT OF R&D ACTIVITIES

List of Conferene Published by the faculty during- 2024-25

ECE

S.No	Name of the Author(s)	Department of the Author(s)	Title of the paper	Name of the Conference	Volume	Issue	Page Numbers (Ex: 102-110)	Day of publication	Month of publication	Year of publication	National	International	ISSN / ISBN	ICI / UGC Care	Scopus	SCI	Web of Science (SCIE / ESCI)	Journal link (DOI)	Link to the notification in Scopus enlistment of the Journal
1	B. Rakesh Babu, Fahimuddin Shaik, Vinit Kumar Gunjan, Shaik Karimullah, K. Riyazuddin	ECE	Cardiovascular Disease Detection Through Integrated Spectral Analysis and Deep Learning	IEEE	-	-	389-394	23	May	2025	-	Yes	979-8-3503-4387-8	-	Yes	-	-	https://doi.org/10.1109/ISML60050.2024.11007361	https://doi.org/10.1109/ISML60050.2024.11007361
2	M. Guru Vimal Kumar K. Kalaivani Y. Sunanda M. Boobalan S. Ashok Kumar	ECE	Vision-Based AI Technologies for Efficient Pig Farming	IEEE	-	-	1199-1204	13	May	2025	-	Yes	979-8-3315-4158-3	-	Yes	-	-	https://doi.org/10.1109/I3CEET61722.2024.10994141	https://doi.org/10.1109/I3CEET61722.2024.10994141
3	G. Obulesu, M. Ravi Kishore, Fahimuddin Shaik, Shaik Karimullah, Ch. Nagaraju	ECE	Automatic Segmentation of Retinal Blood Vessel Using the Homomorphic Filter and Multilevel Algorithm	Springer Cognitive Science and Technology	1	–	415–424	25	March	2025		Yes	978-981-97-9261-0		Yes			https://doi.org/10.1007/978-981-97-9262-7_36	https://doi.org/10.1007/978-981-97-9262-7_36
4	G. Obulesu, M. Ravi Kishore, Shaik Karimullah, Fahimuddin Shaik, Ch. Nagaraju	ECE	Multi-modal Medical Novel Image Fusion by Using DTNP Systems	Springer Cognitive Science and Technology	1	–	425–436	25	March	2025		Yes	978-981-97-9261-0		Yes			https://doi.org/10.1007/978-981-97-9262-7_37	https://doi.org/10.1007/978-981-97-9262-7_37
5	M. Ravi Kishore, D. Suresh, G. Obulesu, Syed Javeed Basha, D. Vishnuvardhan	ECE	Detection of Skin Disease Using Convolution Neural Network	Cognitive Science and Technology	1	—	863–872	25	Mar	2025	—	Yes	978-981-97-9261-0	—	Yes	—	—	https://doi.org/10.1007/978-981-97-9262-7_74	https://doi.org/10.1007/978-981-97-9262-7_74
6	K. Shankar, Syed Javeed Basha, Vinit Kumar Gunjan, D. Vishnu Vardhan	ECE	An Efficient Soft Descrambling Procedure to Enable Soft-Source-Information-Combining for Wireless Networking	Cognitive Science and Technology	1	–	73–81	25	Mar	2025		Yes	978-981-97-9261-0		Yes			https://doi.org/10.1007/978-981-97-9262-7_7	https://doi.org/10.1007/978-981-97-9262-7_7
7	Pavan Kumar Reddy Y, Sunanda Y, Uday Kiran T, Venkata Sadvika M, Shankar K	ECE	ACO-OFDM in Underwater Optical Communication	Cognitive Science and Technology	–	–	837–849	25	Mar	2025		Yes	978-981-97-9261-0		Yes			http://dx.doi.org/10.1007/978-981-97-9262-7_72	http://dx.doi.org/10.1007/978-981-97-9262-7_72

8	S. Fahimuddin, Shaik Karimullah, Vinit Kumar Gunjan, D. Vishnu Vardhan	ECE	Colour Image Segmentation Using Random Walker Approach	Springer Cognitive Science and Technology	1	–	103–113	25	March	2025		Yes	978-981-97-9261-0		Yes			https://doi.org/10.1007/978-981-97-9262-7_10	https://doi.org/10.1007/978-981-97-9262-7_10
9	S. Fahimuddin, Shaik Karimullah, Mudassir Khan, Vinit Kumar Gunjan	ECE	An Effective Clustering-Based Color Image Segmentation via Substantial Extracted Features	Springer Cognitive Science and Technology	1		93–101	25	March	2025		Yes	978-981-97-9261-0		Yes			https://doi.org/10.1007/978-981-97-9262-7_9	https://doi.org/10.1007/978-981-97-9262-7_9
10	S. Fahimuddin, Shaik Karimullah, Vinit Kumar Gunjan, P. Hari Obulesu, D. Vishnu Vardhan	ECE	Design and Development of Fossil Image Segmentation System Using Hybrid Evolutionary Algorithms	Springer Cognitive Science and Technology	1	–	83–92	25	March	2025		Yes	978-981-97-9261-0		Yes			https://doi.org/10.1007/978-981-97-9262-7_8	https://doi.org/10.1007/978-981-97-9262-7_8
11	M. Tejaswi, S. Fahimuddin, P. Hari Obulesu, Shaik Karimullah, Syed Javeed Basha	ECE	Speckle Reduction for the SAR Images Using an Improved Truncated Variational Method—Based Array	Springer Cognitive Science and Technology	1	–	851–862	25	March	2025		Yes	978-981-97-9261-0		Yes			https://doi.org/10.1007/978-981-97-9262-7_73	https://doi.org/10.1007/978-981-97-9262-7_73
12	S. Fayaz Begum, Shaik Karimullah, Fahimuddin Shaik, Syed Javeed Basha, P. Symala Devi	ECE	UART Implementation for RFID Modules with Various FPGA Technologies	Springer Cognitive Science and Technology	1	–	403–413	25	March	2025		Yes	978-981-97-9261-0		Yes			https://doi.org/10.1007/978-981-97-9262-7_35	https://doi.org/10.1007/978-981-97-9262-7_35
13	S. Fayaz Begum, Fahimuddin Shaik, Shaik Karimullah, Syed Javeed Basha	ECE	Image Segmentation Using a Robust Fuzzy Subspace Clustering Approach	Springer Cognitive Science and Technology	–	–	437–447	25	March	2025		Yes	978-981-97-9261-0		Yes			http://dx.doi.org/10.1007/978-981-97-9262-7_38	http://dx.doi.org/10.1007/978-981-97-9262-7_38
14	Tejaswini Murrarysetty, C. Deepa, K. Babi, B. Bhargavi, E. Ajay Kumar	ECE	Precise Detection of Vitiligo Using Deep Learning Methodology	IEEE	-	-	01-Jun	20	Mar	2025	-	Yes	979-8-3503-0914-0	-	Yes	-	-	https://doi.org/10.1109/ICRISST59181.2024.10921796	https://doi.org/10.1109/ICRISST59181.2024.10921796
15	K. Riyazuddin, Apurupa Dugginenı, Asmabharin Shaik, Chakradhar Maddam, Dhananjaya Kurukundu	ECE	Revolutionizing 6G Networks: Large Intelligent Surfaces and Non Orthogonal Multiple Access	IEEE	-	-	1_5	20	Mar	2025	-	Yes	979-3-031-77074-6	-	Yes	-	-	https://doi.org/10.1109/ICRISST59181.2024.10922081	https://doi.org/10.1109/ICRISST59181.2024.10922081
16	L. Siva Yamini, C. Venkatesh, B. Venkatesh, K. Sunil, P. Surendra, N. Sai Kumar Reddy	ECE	SOBOT: Design And Development of UV Sterilization Ostensible Doctor Robot for Clinical Purposes Based on IoT	IEEE Xplore	—	—	1–5	20	Mar	2025	—	Yes	979-8-3503-0914-0	—	Yes	—	—	https://doi.org/10.1109/ICRISST59181.2024.10921946	https://doi.org/10.1109/ICRISST59181.2024.10921946

17	L. Siva Yamini, C. Venkatesh, Bhanuja Chalivendula, Guru Hari Prasad Annadanam, Anusha Kanaganipalli, Chethan Siva Mogili	ECE	A Dynamic Deep Learning Model for Detection and Stage Categorization of Diabetic Retinopathy on Retinal Images	IEEE Xplore	—	—	1–5	20	Mar	2025	—	Yes	979-8-3503-0914-0	—	Yes	—	—	https://doi.org/10.1109/ICRISST59181.2024.10921992	https://doi.org/10.1109/ICRISST59181.2024.10921992
18	C. Venkatesh, L. Siva Yamini, E. Thaniya, A. Ushanjali, K. Vishnu Vardhan, S. Zaheer Basha	ECE	An Artificial Intelligence Based Deep Learning Technique for Recognition of Multiple Brain Tumors on MRI Images	IEEE Xplore	—	—	1–9	20	Mar	2025	—	Yes	979-8-3503-0914-0	—	Yes	—	—	https://doi.org/10.1109/ICRISST59181.2024.10921807	https://doi.org/10.1109/ICRISST59181.2024.10921807
19	G.S.S.S.S.V. krishna Mohan, Mamidipaka Hema, R. Gurunadha, Aenikapati Swetha Priya, Syamala Devi P, G. Usandra Babu	ECE	FinFET Based Design and Performacne Analysis of Full Adders	INSPECT 2024 Conference	—	—	01-May	27	Feb	2025	-	Yes	979-8-3503-7952-5	-	Yes	-	-	https://doi.org/10.1109/INSPECT63485.2021.10892213	https://doi.org/10.1109/INSPECT63485.2021.108926213
20	Shaik Karimullah, Fahimuddin Shaik, Mudassir Khan, M. Ravi Kishore	ECE	Programmable Wireless World with Reconfigurable Intelligent Surfaces for High Speed and Low Noise Data Transmission	Springer Cognitive Science and Technology	2	–	665–677	26	February	2025		Yes	979-981-97-9265-8		Yes			https://doi.org/10.1007/978-981-97-9266-5_65	https://doi.org/10.1007/978-981-97-9266-5_65
21	Shaik Karimullah, Vinit Kumar Gunjan, S. Fahimuddin, Mudassir Khan	ECE	Smart Reflection Surface with Low Complexity and Maximum Sum Capacity Using MIMO System	Springer Cognitive Science and Technology	2	–	655–663	26	February	2025		Yes	979-981-97-9265-8		Yes			https://doi.org/10.1007/978-981-97-9266-5_64	https://doi.org/10.1007/978-981-97-9266-5_64
22	M. Tejaswi, S. Fahimuddin, P. Hari Obulesu, Shaik Karimullah	ECE	Minimization of the Image Surface Curvature via Image Reconstruction Using Discrete Mean and Gaussian Curvature	Springer Cognitive Science and Technology	2	–	627–636	26	February	2025		Yes	979-981-97-9265-8		Yes			https://doi.org/10.1007/978-981-97-9266-5_61	https://doi.org/10.1007/978-981-97-9266-5_61
23	Shaik Ashraf Ali, Vinit Kumar Gunjan, S. Fahimuddin, Shaik Karimullah	ECE	A Comprehensive Study on Significance of Optimization Algorithms Applied in Various Fields for Better Results	Springer Cognitive Science and Technology	2	–	679–690	26	February	2025		Yes	979-981-97-9265-8		Yes			https://doi.org/10.1007/978-981-97-9266-5_66	https://doi.org/10.1007/978-981-97-9266-5_66
24	Ch. Nagaraju, S. Fahimuddin, Vinit Kumar Gunjan, Shaik Karimullah	ECE	A Stochastic Geometry Approach to Performance Evaluation of Multiuser NOMA Wireless-Powered mMTC Networks	Proceedings of the Third International Conference on	2	–	279–287	26	February	2025		Yes	978-981-97-9265-8		Yes			https://doi.org/10.1007/978-981-97-9266-5_28	https://doi.org/10.1007/978-981-97-9266-5_28
25	B. Rakesh Babu, K. Riyazuddin, S. M. D. Fayaz Basha, Mudassir	ECE	Hyper Spectral Imagery System to Detect Endmember Sources	Cognitive Science & Technology	2	-	299-305	26	Feb	2025	-	Yes	979-981-97-9265-8	-	Yes	-	-	https://doi.org/10.1007/978-981-97-9266-5_30	https://doi.org/10.1007/978-981-97-9266-5_30

26	K. Riyazuddin, S. Bajid Vali, B. Abdul Raheem, S. M. D. Fayaz Basha	ECE	Multiband OFDM Uplink and Mixed Receiving in the Millimeter Wave	Cognitive Science & Technology	2	-	289-297	26	Feb	2025	-	Yes	979-981-97-9265-8	-	Yes	-	-	https://doi.org/10.1007/978-981-97-9266-5_29	https://doi.org/10.1007/978-981-97-9266-5_29
27	K. Riyazuddin, B. Abdul Raheem, S. Bajid Vali, Pabbati Swathi, B. Rakesh Babu, S. M. D. Fayaz Basha	ECE	Beam Phenomenon in Dual-Polarized Antennas Using MIMO	Cognitive Science & Technology	2	-	637-645	26	Feb	2025	-	Yes	979-981-97-9265-8	-	Yes	-	-	https://doi.org/10.1007/978-981-97-9266-5_62	https://doi.org/10.1007/978-981-97-9266-5_62
28	Ch. Nagaraju, Mudassir Khan, S. Fahimuddin, Shaik Karimullah	ECE	Time-Correlated Fading Channels for Minimization of Energy Consumption in Wireless Networked Control Systems	Cognitive Science & Technology	2	–	617–625	26	February	2025		Yes	979-981-97-9265-8		Yes			https://doi.org/10.1007/978-981-97-9266-5_60	https://doi.org/10.1007/978-981-97-9266-5_60
29	B. Lakshmi Devi, S. Fahimuddin, Mudassir Khan, Shaik Ashraf Ali	ECE	A Novel Contrast Enhancement Method for Color Images Using Type-II Fuzzy Set Algorithm	Springer Cognitive Science and Technology	2	–	269–277	26	Feb	2025		Yes	978-981-9266-5		Yes			https://doi.org/10.1007/978-981-97-9266-5_27	https://doi.org/10.1007/978-981-97-9266-5_27
30	Y. Sunanda, Y. Pvana Kumar Reddy, K. Shankar, C. Yaswanth Reddy, D. Sreelekha, C. Varshini Goud	ECE	Enhanced Image Dehazing Using Contrast-Based Fusion Techniques	Cognitive Science and Technology	2	–	647–654	26	Feb	2025		Yes	978-981-97-9265-8		Yes			https://doi.org/10.1007/978-981-97-9266-5_63	https://doi.org/10.1007/978-981-97-9266-5_63
31	M. Venkata Dasu, G. Lakshmi, A. Jeevitha, Y. Manasa, K. Hussain Peera, G. Jagan Mohan Reddy	ECE	Brain Tumour Segmentation in Multimodal MRI via Pixel-Level and Feature-Level Image Fusions	Business Intelligence and Data Analytics	413	—	507–520	25	Feb	2025	—	Yes	979-981-977716-7	—	Yes	—	—	https://doi.org/10.1007/978-981-97-7717-4_36	https://doi.org/10.1007/978-981-97-7717-4_36
32	N. Penchalaiah, B. Venkatesh, Y. Suresh, Lakshmi Sowjanya Koneru, Mallikharjuna Rao Nuka, J. Chinna Babu	ECE	IoT Intrusion Detection System for Vehicle and Emission Monitoring	IEEE Xplore	–	–	328–333	11	Feb	2025		Yes	979-8-3315-0579-0		Yes			https://doi.org/10.1109/ICCCMLA63077.2024.10871291	https://doi.org/10.1109/ICCCMLA63077.2024.10871291
33	J. Chinna Babu, Lakshmi Sowjanya Koneru, Adarsh Kumar, B. Venkatesh	ECE	Early Enhancements within IoT Technology Integration for Ecological, Security, and Economic Auditing in Underground Mines	IEEE Xplore	–	–	317–327	11	Feb	2025		Yes	979-8-3315-0579-0		Yes			https://doi.org/10.1109/ICCCMLA63077.2024.10871635	https://doi.org/10.1109/ICCCMLA63077.2024.10871635
34	B. Pandurangaraju, Balaraju Vijayalakshmi, S. Ashok Kumar, K. Uday Kumar Reddy, Shaik Karimullah, Fahimuddin Shaik	ECE	Optimizing Natural Language Understanding: A Comprehensive Study of Python's Top Libraries	IEEE Xplore	–	–	559–563	11	Feb	2025		Yes	979-8-3315-0580-6		Yes			https://doi.org/10.1109/ICCCMLA63077.2024.10871883	https://doi.org/10.1109/ICCCMLA63077.2024.10871883

35	C. Venkatesh, L. Siva Yamini, D. Sai Kumar, B. Nelima, P. Obulesu, S. Pavan Kumar Reddy	ECE	Development of IoT Multilingual Voice Controlled Home Automation System	Cognitive Computing and Cyber Physical Systems, LNCS, Springer	—	—	347-362	9	Feb	2025	—	Yes	978-3-031-77080-7	—	Yes	—	—	https://www.springerprofessional.de/en/development-of-iot-multilingual-voice-controlled-home-automation/50616366?searchResult=1.Development%20of%20IoT%20Multilingual%20Voice%20Controlled%20Home%20Automation%20System&searchBackButton=true	https://www.springerprofessional.de/en/development-of-iot-multilingual-voice-controlled-home-automation/50616366?searchResult=1.Development%20of%20IoT%20Multilingual%20Voice%20Controlled%20Home%20Automation%20System&searchBackButton=true
36	P. Syamala Devi, P. Sai Preetham Reddy, U. Venkata Sai Kiran, G. Sree Sasidhar, D. Sudheer	ECE	An Energy-Efficient 8-Tap FIR Filter Design in 22nm DTMOS Technology	Cognitive Computing and Cyber Physical Systems	599	—	300–310	9	Feb	2025	—	Yes	978-3-031-77080-7	—	Yes	—	—	https://doi.org/10.1007/978-3-031-77081-4_24	https://doi.org/10.1007/978-3-031-77081-4_24
37	P. Syamala Devi, A. Naga Uma Maheswari, P. Naga Hemalatha, B. Hemanth Kumar, P. Nandishwara Reddy	ECE	Performance Comparison of 4T SRAM Cell Using Different Techniques at 32nm and 22nm Nodes for Portable Electronic Devices	Cognitive Computing and Cyber Physical Systems	—	—	311–322	9	Feb	2025	—	Yes	978-3-031-77080-7	—	Yes	—	—	http://dx.doi.org/10.1007/978-3-031-77081-4_25	http://dx.doi.org/10.1007/978-3-031-77081-4_25
38	S. Fayaz Begum, A. Sreelekha, T. Saibaba, C. Supriya, M. Sreedhar Naik	ECE	High performance 10TSRAM-based decoder for 4x4 array	Cognitive Computing and Cyber Physical Systems	599	-	289-299	9	Feb	2025	-	Yes	978-3-031-77080-7	-	Yes	-	-	https://doi.org/10.1007/978-3-031-77081-4_23	https://doi.org/10.1007/978-3-031-77081-4_23
39	Venkatesh C, Sivayamini L, Reddy G.J., Lakshumma S., Hari B., Reddy M.L.L	ECE	AI-Powered Diagnostic Model for Lung and Liver Cancer Detection	Cognitive Computing and Cyber Physical	598	–	252–271	8	Feb	2025		Yes	978-3-031-77077-7		Yes			https://doi.org/10.1007/978-3-031-77078-4_21	https://doi.org/10.1007/978-3-031-77078-4_21
40	G.Thirumalaiah, K.KeerthiNaidu, M. Hanumanthu	ECE	Industrial Fault Detetion system using Iot based Arduino and Node MCU	ICOFE-2024 Proeedings	-	-	1-5	3	Jan	2025	-	Yes	-	-	Yes	-	-	https;//dx.doi.org/10.2139/ssrn.5076104	https;//dx.doi.org/10.2139/ssrn.5076104
41	B. Umakanth, Fahimuddin Shaik, Shaik Karimullah, K. Naga Shankar Reddy, Paddapullaiahgari Hariobulesu, Balaraju Vijayalakshmi	ECE	Incorporating Grey Wolf Optimization and Recurrent Neural Networks for Accurate Brain Tumor Detection	IEEE Xplore	–	–	1–5	12	Nov	2024		Yes	979-8-3503-888-0		Yes			10.1109/ACROSET62108.2024.10743695	10.1109/ACROSET62108.2024.10743695
42	G.Amjad Khan , N.Deepthi, Fahimuddin Shaik, B. Pandurangaraju, Shaik Karimullah	ECE	Integrated Deep learning methodology for early Galucoma detection and diagnosis using retinal fundus	IEEE Explore	-	-	1-4	12	Nov	2024		Yes	-		Yes			https;//doi.org/10.1109/ACROSET62108.2024.10743780	https;//doi.org/10.1109/ACROSET62108.2024.10743780

43	Narender Chintamanu, Tirumalaiah G, K. Raghuveer, Vills Pawar, Savita, Vuda Sreenivasa Rao	ECE	Enhancing Agriculture intelligence and sustainability with an intelligent irrigation system based on wireless sensor networks and fuzzy PID control	CRC Press	-	-	232-237	-	NOV	2024	-	Yes	-	-	Yes	-	-	http;//dx.doi.org/10.1201/9781003559092-40	http;//dx.doi.org/10.1201/9781003559092-40
44	S. Ashok Kumar, B. Pandurangaraju, Balaraju Vijayalakshmi, P. Phanindra Kumar Reddy, Shaik Karimullah, Fahimuddin Shaik	ECE	Integrated Methodology for Early Glaucoma Diagnosis Using Retinal Fundus Images	IEEE Xplore	–	–	1–6	4	Nov	2024		Yes	979-8-3503-7809-2		Yes			https://doi.org/10.1109/ICEECT61758.2024.10739184	https://doi.org/10.1109/ICEECT61758.2024.10739184
45	Syamala Devi P, Pallavi P, Raja Vikram P, Ramachandra T, Sathya Sai Reddy K	ECE	Design of 4-Bit Synchronous Counter Using TSPC-SVL T Flip-Flop for Power Reduction	ICAIT 2024 Conference	—	—	1–5	4	Oct	2024	—	Yes	979-8-3503-8386-7	—	Yes	—	—	https://doi.org/10.1109/ICAIT61638.2024.10690654	https://doi.org/10.1109/ICAIT61638.2024.10690654
46	R. Sivapriyan, Rashel Sarkar, Y. Pavan Kumar Reddy, S. Loganayagi, Doaa Saadi Kareem, Al-Hussain Meassar	ECE	The Framework for Training and Validation of Healthcare System using Accurate Classifier Model	IEEE Xplorer	-	-	Dec-15	9	Aug	2024	-	Yes	979-8-3503-6016-5	-	Yes	-	-	https://doi.org/10.1109/ICACITE60783.2024.10616861	https://doi.org/10.1109/ICACITE60783.2024.10616861
47	S. Fayaz Begum, Fahimuddin Shaik, Shaik Karimullah, D. Mahalakshmi, T. Lavanya, M	ECE	Emotion Recognition from Physiological Signals Using Ensembled Machine Learning Strategy	IEEE Xplore	–	–	1–8	23	July	2024		Yes	979-8-3503-7180-2		Yes			https://doi.org/10.1109/ICECCC61767.2024.10593862	https://doi.org/10.1109/ICECCC61767.2024.10593862
48	Paddapullaiahgari Hariobulesu, Fahimuddin Shaik, Shaik Karimullah, Lakshmi Bhanu, Madhavi B, Kiran G	ECE	Extreme Learning Machine (ELM) Algorithm for the Detection of Diabetic Retinopathy	IEEE Xplore	–	–	1–6	23	July	2024		Yes	979-8-3503-7180-2		Yes			https://doi.org/10.1109/ICECCC61767.2024.10593933	https://doi.org/10.1109/ICECCC61767.2024.10593933
49	B. Lakshmi Devi, Fahimuddin Shaik, Shaik Karimullah, B. Nandini, J. Hemalatha, S. Jagadeswar Reddy	ECE	Integrated Rasnet Model for Efficient Automated Assessment and Sorting of Leaf Diseases in Agriculture	IEEE Xplore	–	–	1–6	23	July	2024		Yes	2165-4743		Yes			https://doi.org/10.1109/ICECCC61767.2024.10593830	https://doi.org/10.1109/ICECCC61767.2024.10593830
50	Lakshmidevi Bodagala, Harsha Nandini PeddiReddy, Aparna Guntakanti, Gopalakrishna Pujari	ECE	Optimizing Depression Detection through IVMPNet: A Fusion of Inception V4 and MLP	IEEE	-	-	1225-1230	12	May	2024	-	Yes	2165-4743	-	Yes	-	-	https://doi.org/10.1109/ICICCS65191.2025.10985088	https://doi.org/10.1109/ICICCS65191.2025.10985088

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

CONSOLIDATED REPORT OF R&D ACTIVITIES - 2024-25

List of Publications

DEPARTMENT OF ------CSE-------

S.No	Name of the Author(s)	Department of the Author(s)	Title of the paper	Name of the Journal	Volume	Issue	Page Numbers (Ex: 102-110)	Day of publication	Month of publication	Year of publication	National	International	ISSN / ISBN	ICI / UGC Care	Scopus	SCI	Web of Science (SCIE / ESCI)	Other	Journal link (DOI)	Link to the notification in UGC enlistment of the Journal	Link to the notification in Scopus enlistment of the Journal	Link to the notification in WoS enlistment of the Journal
1	P.SWATHI,	CSE	Towards Real-Time Lung Cancer Diagnosis: A deep learning approach with optimized cnn for ct scan analysis				1-8	25	6	2025		YES	979-8-3315-2141-7	-	-	-	-	IEEE	-	-	-	
2	Pabbati Swa	CSE	Hybrid Deep Learning Algorithm to Predict Leaf Diseases for Botanical Sentinals		2		415-423	6	6	2025		YES	-	-				SPRINGER	https://doi.org/10.1007/978-3-031-78940-3_44			
3	SHAIK MAH/	CSE	ANALYSIS AND PREDICTION OF CRIME HOTSPOTS USING MACHINE LEARNING WITH STACKED GENERALIZATION APPROACH	Springer Nature				30	6	2025		YES	978-981-95-0268-4		SPRINGER NATURE							
4	D.SARIKA	CSE	Battery Monitoring and Control System for EV using IOT Technology	SCOPUS				1	4	2025		YES	979-8-3315-0572-1		YES				https://doi.org/10.1109/TEECCON64024.2024.10939820			
5	D.SARIKA	CSE	An Enhanced Repetitive Control Framework for Adaptive Neuro-Fuzzy Learning Grid-Connected Inverter with Current Control and Frequency Adaptability	SCOPUS				1	4	2025		YES	979-8-3315-0572-1		YES				https://doi.org/10.1109/TEECCON64024.2024.10939415			
6	k karpagava	CSE	Innovative MPTSSNet with Modified Dung Beetle Algorthim for superior Remote sensing preformance on UC-Merced and SIRI-WHU Datasets	SCOPUS				2	4	2025		YES	979-8-3503-7496-4		YES				http://dx.doi.org/10.1109/ACOIT62457.2024.10939148			
7	D.SARIKA	CSE	Facial Sentiment Analysis: Enhancing Emotion Recognition Through Advanced Convolutional Neural Network Architectures	SCOPUS			1-8	25	3	2025		YES	979-8-3503-7652-4		YES				https://doi.org/10.1109/ICICEC62498.2024.10808546			
8	Dr.NMerrin	CSE	Effective Minimization of Fraud Using a Hybrid Novel Approach on Social Media,	IEEE Conference	27		76-84	27	3	2025		YES			yes				10.1109/ICSADL65848.2025.10933474			
9	N SUNIL KU	CSE	PREDICTING EURO TO DOLLAR EXCHANGE RATES USING MACHINE LEARNING	PROCEEDINGS OF FIRST IN	Vol-1		20-27		3	2025		YES	978-81-931570-0-9									
10	P Swathi	CSE	Beam Phenomenon in Dual-Polarized Antennas Using MIMO	Proceedings	2		637-645	26	2	2025		YES		-	-	-	-	SPRINGER	https://doi.org/10.1007/978-981-97-9266-5_62			
11	D.SARIKA	CSE	FCS-MPC Based Grid-Tied Self-Balanced Switched Capacitor Reduced Switch Nine Level Inverter	SCOPUS				11	2	2025		YES	979-8-3315-0580-6		YES				https://doi.org/10.1109/ICCCMLA63077.2024.10871801			
12	S.Riyazbanu	CSE	Healthcare Information Systems and Study of Machine Learning Technology for Cancer Detection	SCOPUS			1501-1506	21	1	2025		YES	ISBN: 979-8-3315-3242-0		IEEE XPLORE SCOPUS				10.1109/ICACRS62842.2024.10841587			

13	Dr.T.HARIKA	CSE	Brain Tumor Classification from MRI Scans Using a Novel CNN Architecture and Optimization Techniques	SCOPUS			117–131,	27	12	2024		YES	978-3-031-73476-2		SPRINGER NATURE				https://doi.org/10.1007/978-3-031-73477-9_9			
14	Dr.N.Merrin	CSE	Intelligent Tool Wear Monitoring: A Confluence of Improved Dragonfly Optimization and Deep Belief Networks	Springer Nature				30	11	2024		YES	978-981-97-5081-8		yes				https://doi.org/10.1007/978-981-97-5081-8_39		https://www.scopus.com/authid/detail.uri?authorId=57216503538	
15	B.Naveen	CSE	Accident Severity Detection Using Machine Learning Algorithms.	ICDSMLA-2023	Vol-1		324-334	6	10	2024		YES	978-981-97-8031-0	-	Springer	-	-		DOIhttps://doi.org/10.1007/978-981-97-8031-0_34	-	https://link.springer.com/book/10.1007/978-981-97-8031-0	
16	Dr.NMerrin	CSE	Novel Efficient approach that enhances security over biometric computer vision technique."Leveraging computer vision to biometric applications,						10	2024		YES			yes							
17	N SUNIL KU	CSE	Accident Severity Detection Using Machine Learning Algorithms.	ICDSMLA-2023	Vol-1		324-334	6	10	2024		YES	978-981-97-8031-0	-	Springer							
18	Pabbati Swa	CSE	Optimizing Job Shop Scheduling with Dynamic				1-6	20	9	2024		YES	979-8-3503-7544-2/24	-	-	-	-	IEEE				

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

CONSOLIDATED REPORT OF R&D ACTIVITIES

List of Research Papers published by the faculty during- 2024-25

Department of AI&DS

S.No	Name of the Author(s)	Department of the Author(s)	Title of the paper	Name of the Journal	Volume	Issue	Page Numbers (Ex: 102-110)	Day of publication	Month of publication	Year of publication	National	International	ISSN / ISBN	ICI / UGC Care	Scopus	SCI	Web of Science (SCIE / ESCI)	Other	Journal link (DOI)	Link to the notification in UGC enlistment of the Journal	Link to the notification in Scopus enlistment of the Journal	Link to the notification in WoS enlistment of the Journal
1	B. Pandu Ranga Raju, Fahimuddian Shaik, Ayesha Hussain.S, Hemanthini.B, Kethana.P, Lakshmi Akhila	AI&DS	Advanced Recruitment Strategies in Business Intelligence Systems: A Comparative Study of Machine Learning Models	2025 8th International Conference on Trends in Electronics and Informatics (ICOEI) (IEEE Conference paper)			1628-1631	30-05-2025	May	2025		International	979-8-3315-4460-7		Scopus						https://doi.org/10.1109/ICOEI65986.2025.11013060	
2	B. Pandu Ranga Raju, Bharathi Thunga, Kurakula Arun Kumar, D. Ganesh, Avula Chitty, K. Reddy Madhavi	AI&DS	Face Recognition Using MTCNN and FACENET and Classification Using SVM Classifier	International Conference on Soft Computing and Pattern Recognition (Springer_LNNS)	1245	(SoCPaR 2023) Volume 2: Deeplearning & Large language Models	342–353	25-05-2025	May	2025		International	Lecture Notes in Networks and Systems 1245		Scopus						https://doi.org/10.1007/978-3-031-81083-1_34	
3	K. Uday kumar Reddy, Fahimuddin Shaik, V. Swathi P. Sree Vidhya A. Yashaswini J.Umamaheswari	AI&DS	Design and Implementation of Theft Detection Using YOLO Based Object Detection Methodology and Gen AI for Enhanced Security Solutions	2025 International Conference on Inventive Computation Technologies (ICICT) (IEEE Conference paper)			583 - 589	23-05-2025	May	2025		International	979-8-3315-1224-8		Scopus						https://doi.org/10.1109/ICICT64420.2025.11005144	
4	U. Naresh Kumar,Vardhan Reddy Doddi, Sivasankar Reddy Kondareddy, Shanmukha Rao Sahukari, Maddirala Santhosh Kumar , Eduru Venkata Raghunath Reddy	AI&DS	Harnessing Advanced AI Techniques for Code Generation: Transforming Software Development with Intelligent Automation and Predictive Algorithms	2025 International Conference on Inventive Computation Technologies (ICICT) (IEEE Conference paper)			1548-1552	23-05-2025	May	2025		International	979-8-3315-1224-8		Scopus						https://doi.org/10.1109/ICICT64420.2025.11005308	

5	P. Phanindra Kumar Reddy , L. Hari Krishna, A. Ramesh Babu, Fahimuddin Shaik, K. Uday kumar Reddy	AI&DS	Machine Learning Analysis of Free Convection Flow through a Porous Medium in a Third-Grade Vertical Channel: A Comprehensive Exploration	2024 Intelligent Systems and Machine Learning Conference (ISML) (IEEE Conference paper)			734 - 738	23-May-25	May	2025		International	979-8-3503-4387-8		Scopus						https://doi.org/10.1109/ISML60050.2024.11007381	
6	L. Hari Krishna, P. Phanindra Kumar Reddy, A. Ramesh Babu, Fahimuddin Shaik, K. Uday kumar Reddy	AI&DS	AI-Enhanced Analysis of Unsteady Convection in Copper-Water Nanofluid Flow over a Vertically Moving Porous Plate	2024 Intelligent Systems and Machine Learning Conference (ISML) (IEEE Conference paper)			728-733	23-May-25	May	2025		International	979-8-3503-4387-8		Scopus						https://doi.org/10.1109/ISML60050.2024.11007442	
7	P. Phanindra Kumar Reddy , Fahimuddin Shaik , S. Sreedhar Gowd, V. Sudheer , S. Sivanand , K. Siva Kumar	AI&DS	Revolutionizing E-Commerce Customer Support: Advanced AI-Powered Chatbots for Enhanced User Experience & Operational Efficiency	2025 International Conference on Intelligent Computing and Control Systems (ICICCS) , (IEEE Conference Paper)			1477-1480	12-May-25	May	2025		International	979-8-3315-1208-8		Scopus						https://doi.org/10.1109/ICICCS65191.2025.10985646	
8	S. Ashok Kumar Fahimuddian Shaik B. Yashwitha P. Vidyavathi A.Uma Maheswari P. Spurthi	AI&DS	Intelligence Pest Detection and Control in Agriculture Using Computer Vision and Deep Learning	2025 International Conference on Intelligent Computing and Control Systems (ICICCS) (IEEE Conference Paper)			1147-1150	12-May-25	May	2025		International	979-8-3315-1208-8		Scopus						https://doi.org/10.1109/ICICCS65191.2025.10985611	
9	S. Prasanna Fahimuddian Shaik, S. Dileep Jawahar Reddy, K. Deekshith Reddy D. Dileep Kumar D. Ajay Gowd	AI&DS	Traffic-Flow Predictor: Predicting Traffic Volume and Patterns	2025 International Conference on Intelligent Computing and Control Systems (ICICCS) (IEEE Conference Paper)			1151-1155	12-05-2025	May	2025		International	979-8-3315-1208-8		Scopus						https://doi.org/10.1109/ICICCS65191.2025.10984693	

10	Ms P. Renuka, , Fahimuddian Shaik, Shariq Anjum Shaik, Shaik Mahammad Fareed , C. Om Tharun Kumar Reddy , R. Vamsi Vardhan Reddy	AI&DS	Advanced Image Generation using Generative Adversarial Networks (GANs): Innovations in Creating High-Quality Synthetic Images with AI	2025 International Conference on Intelligent Computing and Control Systems (ICICCS) (IEEE Conference Paper)			1414-1418	12-05-2025	May	2025		International	979-8-3315-1208-8		Scopus						https://doi.org/10.1109/ICICCS65191.2025.10985061	
11	Karamala Naveen & Ramesh Peramalasetty, M. Joshna, K. Navaz, L. Jayasree, K. Reddy Madhavi	AI&DS	Navigating the E-Learning landscape: A Systematic Evaluation of Website Performance using the Weighted Sum Method	International Conference on Soft Computing and Pattern Recognition (Springer LNNS)	1246	(SoCPaR 2023) Volume 3: Information Retrival and Applications	419-428	04-05-2025	May	2025		International	LNNS Volume 3, 1246		Scopus						https://link.springer.com/chapter/10.1007/978-3-031-88992-9_42	
12	Ch. Srinivasmurthy, Pandu Ranga Raju, T. Venkata krishna moorthy, K. Padmaja, T. Devaraju, K. Reddy Madhavi	AI&DS	Detection of Deep Vein Thrombosis Using Machine Learning for CT Images	International Conference on Soft Computing and Pattern Recognition (Springer LNNS)	1243	(SoCPaR 2023) Volume 1: Smart Healthcare	414-421	25-04-2025	April	2025		International	Lecture Notes in Networks and Systems 1243		Scopus						https://doi.org/10.1007/978-3-031-81080-0_38	
13	Kiran Kumar Maguluri, M. Chandra Sekhar, Sandip Dashtath Gorshetwar, S. Prasanna, M. Anusuya , K. Vallarasu	AI&DS	Applications and Advancement of Nanoparticle - Based Drug Delivery in Lung Cancer Treatment	2025 3rd International Conference on Integrated Circuits and Communication Systems (ICICACS) (IEEE Conference Paper)			1 to 6	24-04-2025	April	2025		International	979-8-3315-0845-6		Scopus						https://doi.org/10.1109/ICICAC565178.2025.10968608	

14	Puttapaka Varshitha Kachi Anvesh N. Sai Yashwanth Y. Varun Prasad A. Ramesh Babu	AI&DS	Foreign Object Debris Detection Using YOLOv5	Intelligent Computing and Automation Proceedings of the 12th International Conference on Frontiers in Intelligent Computing: Theory and Applications (FICTA 2024) Conference proceedings © 2025, (Springer LNNS)	421	(FICTA 2024) Conference proceedings © 2025	253–263	29-03-2025	March	2025		International	LNNS, volume 421		Scopus						https://link.springer.com/chapter/10.1007/978-981-96-0143-1_20	
15	M.Sivapratap Reddy, P. Phanindra Kumar Reddy	AI&DS	A Survey on Exploring Advances and Challenges in Social Spam Detection Through Machine Learning Approaches	International Conference on Computational Intelligence in Pattern Recognition (Springer LNNS)	1152	CIPR 2024, Vol 1	425-433	05-03-2025	March	2025		International	LNNS, volume 1152		Scopus						https://link.springer.com/chapter/10.1007/978-981-97-8090-7_31	
16	U. Naresh Kumar, K. Madana Mohan, S. Pragadeeswarn, Jobin M. Scaria Baseera .A, D. Seenevasan	AI&DS	Predicting Crops Based on Soil and Environmental Characteristics Using ARIMA and LSTM Model	2024 4th International Conference on Mobile Networks and Wireless Communications (ICMNWC) (IEEE Conference Paper)			1 to 6	20-Feb-25	Febraury	2025		International	979-8-3315-2834-8		Scopus						https://doi.org/10.1109/ICMNWC63764.2024.10871993	
17	B.Pandu Ranga Raju, Balaraju Vijaya Lakshmi, S.Ashok Kumar, K.Uday Kumar Reddy, Shaik Karimullah, Fahimuddian Shaik	AI&DS	Optimizing Natural Language Understanding: A Comprehensive Study of Python's Top Libraries	2024 IEEE 6th International Conference on Cybernetics, Cognition and Machine Learning Applications (ICCCMLA) (IEEE Conference paper)			559-563	11-02-2025	Febraury	2025		International	979-8-3315-0579-0		Scopus						https://doi.org/10.1109/ICCCMLA63077.2024.10871883	

18	G.Amjad Khan, N.Deepthi, Fahimuddian Shaik, B.Pandu Ranga Raju, Shaik Karimullah, Peddapullaiahgari Hariobulesu	AI&DS	Integrated Deep Learning Methodology for Early Glaucoma Detection and Diagnosis using Retinal Fundus Images	2024 International Conference on Advances in Computing Research on Science Engineering and Technology (ACROSET) (IEEE Conference paper)			1 to 4	12-11-2024	November	2024		International	979-8-3503-8880-0		Scopus						https://doi.org/10.1109/ACROSET62108.2024.10743780	
19	K. Uday kumar Reddy , M.Malleeswari P. Phanindra Kumar Reddy, Fahimuddin Shaik, Peddapullaiahgari Hariobulesu	AI&DS	Exploring Diabetic Retinopathy Diagnosis: Insights from a Comprehensive Literature Review and Initial Fundus Image Analysis	2024 International Conference on Electrical Electronics and Computing Technologies (ICEECT) (IEEE Conference paper)			01 to 05	04-11-2024	November	2025		International	979-8-3503-7809-2		Scopus						https://doi.org/10.1109/ICEECT61758.2024.10739014	
20	S.Ashok Kumar, B.Pandu Ranga Raju, Balaraju Vijaya Lakshmi, P.Phanindra Kumar Reddy, Shaik Karimullah, Fahimuddian Shaik	AI&DS	Integrated Methodology for Early Glaucoma Diagnosis Using Retinal Fundus Images	2024 International Conference on Electrical Electronics and Computing Technologies (ICEECT) (IEEE Conference paper)			1 to 6	04-11-2024	November	2024		International	979-8-3503-7809-2		Scopus						https://doi.org/10.1109/ICEECT61758.2024.10739184	
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CONSOLIDATED REPORT OF R&D ACTIVITIES

List of Research Papers published by the faculty during- 2023-24

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S.No	Name of the Author(s)	Department of the Author(s)	Title of the paper	Name of the Journal	Volume	Issue	Page Numbers (Ex: 102-110)	Day of publication	Month of publication	Year of publication	National	International	ISSN / ISBN	ICI / UGC Care	Scopus	SCI	Web of Science (SCIE / ESCI)	Other	Journal link (DOI)	Link to the notification in UGC enlistment of the Journal	Link to the notification in Scopus enlistment of the Journal	Link to the notification in WoS enlistment of the Journal
1	L Hari Krishna, P Phanindra Kumar Reddy, A Ramesh Babu, Fahimuddin Shaik, K. Uday Kumar Reddy	H&S	AI-Enhanced Analysis of Unsteady Convection in Copper-Water Nanofluid Flow over a Vertically Moving Porous Plate	2024 Intelligent Systems and Machine Learning Conference (ISML)			728-733	23	May	2025		International	979-8-3503-4387-8		scopus				https://doi.org/10.1109/ISML60050.2024.11007442			
2	P Phanindra Kumar Reddy, L Hari Krishna, A Ramesh Babu, Fahimuddin Shaik, K. Uday Kumar Reddy	H&S	Machine Learning Analysis of Free Convection Flow through a Porous Medium in a Third-Grade Vertical Channel: A Comprehensive Exploration	2025 Intelligent Systems and Machine Learning Conference (ISML)			734-738	24	June	2025		International	979-8-3503-4387-8		scopus				https://doi.org/10.1109/ISML60050.2024.11007381			

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Department of Management

S.No	Name of the Author(s)	Department of the Author(s)	Title of the paper	Name of the Journal	Volume	Issue	Page Numbers (Ex: 102-110)	Day of publication	Month of publication	Year of publication	National	International	ISSN / ISBN	ICI / UGC Care	Scopus	SCI	Web of Science (SCIE / ESCI)	Other	Journal link (DOI)	Link to the notification in UGC enlistment of the Journal	Link to the notification in Scopus enlistment of the Journal	Link to the notification in WoS enlistment of the Journal
1	Dr. V. Mouneswari	MBA	Shaping Brand Perception: The Role of Influencer Marketing in Consumer Attitudes and Engagement	Academy of Marketing Studies Journal	29	4	1–9	2025		2025		International	1528-2678-29-4-201	Yes					https://doi.org/10.1109/ISML60050.2024.11007442		https://www.researchgate.net/publication/... (URL partly unclear)	

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Innovations in Media C: Federated Learning and BiLSTM Integration for Image and Video Analysis

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***Abstract*—In the ever-evolving landscape of media, the demand for efficient and robust analysis of images and videos has intensified. Traditional methods often struggle to keep pace with the scale and complexity of media data. In response, this study introduces a novel approach that integrates Federated Learning (FL) and Bidirectional Long Short-Term Memory (BiLSTM) networks to enhance the analysis of images and videos in media applications. Federated Learning, a decentralized machine learning technique, enables collaborative model training across multiple edge devices without centralized data aggregation, thus addressing privacy concerns and data silo issues inherent in traditional approaches. By leveraging FL, The proposed framework facilitates the aggregation of insights from diverse sources while preserving data privacy.Furthermore, the integration of BiLSTM networks offers enhanced temporal modeling capabilities, allowing for the extraction of contextual information from sequential data such as video frames.Through experimentation on diverse media datasets, including images and videos, demonstrate the effectiveness of approach in tasks such as object recognition, scene understanding, and action recognition. The results showcase significant improvements in accuracy and efficiency compared to baseline methods, highlighting the potential of Federated Learning and BiLSTM integration for advancing image and video analysis in media applications.Overall, This study contributes to the ongoing efforts to innovate media analysis techniques by harnessing the power of decentralized learning and advanced sequential modeling, paving the way for more intelligent and privacy-preserving media analysis systems. This method achieves an accuracy of 97.5% and has been implemented in Python.**

***Keywords*—Federated Learning; BiLSTM; Image Analysis; Video Analysis; Media Applications; Privacy-preserving Machine Learning**

I. INTRODUCTION

Federated learning is a decentralized machine learning approach that enables the collaborative training of models across multiple devices or servers while keeping the data localized on those devices. This paradigm is particularly transformative for image and video analysis in the realm of media vision, where vast amounts of visual data generated by numerous sources, such as smartphones, surveillance cameras, and IoT devices, are inherently distributed [1]. Federated learning leverages the computational power of edge devices to process and analyze this data locally, thereby addressing privacy concerns and reducing the risk of data breaches by keeping raw data on the originating device [2]. The approach aggregates model updates, rather than the data itself, to build a robust and generalizable model. This is crucial in media vision applications where data is not only voluminous but also sensitive, containing personal or proprietary information[3]. Federated learning for image and video analysis harnesses this distributed data, enabling the development of sophisticated models for tasks such as object detection, facial recognition, and activity recognition, without compromising user privacy. Additionally, by reducing the need for continuous data transfer to centralized servers, federated learning significantly lowers bandwidth consumption and enhances real-time processing capabilities. This method also facilitates personalized model training, as individual device models can be fine-tuned based on local data, leading to more accurate and context-aware predictions[4]. The collaborative nature of federated learning encourages the inclusion of diverse data sources, enriching the model with varied perspectives and improving its performance across different environments and scenarios. Despite its advantages, federated learning presents challenges, including ensuring the efficiency of the federated averaging process, addressing the heterogeneity of device capabilities, and securing the communication channels used for transmitting model updates[5]. Advances in federated learning algorithms, encryption techniques, and efficient communication protocols are

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An Enhanced Repetitive Control Framework for Adaptive Neuro-Fuzzy Learning Grid-Connected Inverter with Current Control and Frequency Adaptability

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***Abstract*—This work proposes an advanced repeated control method (RCM) for a frequency adaptable grid-connected inverter based on fuzzy current control. The primary goal of the suggested strategy is to lower total harmonic distortion (THD) by adjusting the FIR filter in accordance with shifting grid frequencies while maintaining resonant frequencies that match both the fundamental and harmonic grid frequencies. When it is necessary that the sampling frequency ratio be an integer, the repeated control system is chosen due to its high efficiency in tracking periodic signals and low output total harmonic distortion (THD). The RCM's resonant frequencies will deviate from the actual grid's fundamental and harmonic frequencies in an industrial setting where the ratio may not be an integer. As a result, the system's performance may be negatively impacted. against determine whether the suggested control method improves performance, it is compared against a conventional repeated control strategy that uses a PI controller. Through trials conducted at various frequencies, the control approach is assessed in grid-connected mode. The suggested controller successfully demonstrates its superiority over alternative control schemes with regard to the inverter systems' THD level and component harmonic.**

***Index Terms*—FIR filter, gird-connected inverters, fuzzy controller, RCM and THD.**

I. Introduction

THE Distributed Power Generating System (DPGS) has garnered significant attention in recent years, in addition to its contribution and share to the development of renewable power sources. When connecting this green power source to the utility grid, the most common topology is plus width modulation (PWM) voltage source inverter (VSI) [1], [2]. The power quality evaluation of a microgrid is mostly dependent on THD in voltages and currents, and it typically operates in the grid-connected mode. The total harmonic distortion (THD) of wind turbines and solar arrays linked to the grid is 5 % [3]-[5].

The grid-connected VSI has to have a high output power factor and a low output current THD in order to renumerate pollution to the grid. The effectiveness of the applied current control method is essential to the VSI's performance, and microgrid inverters' potentiality harmonic rejection must be high to meet power quality standards [6], [7].

There are various techniques for grid-connected inverters, such as proportional resonant (PR) control and proportional integral (PI) control [8], [9]. The PI control techniques are widely employed in synchronously rotating (d,q) reference frames and are effective with balanced systems; however, they are unable to handle unbalanced disturbance currents, which are common in micro grids [10]. In stationary (a) reference frames, the PR control technique is most frequently used because of its exceptional ability to rule out the steady state erro

A alternative for lowering the THD in voltages or currents is made possible by repetitive control theory, which is regarded as a straightforward learning control technique. In dynamic

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A Novel Dual Temporal Channel Convolutional Network with Exponential Distribution Optimizer for Satellite Image Classification with Google Earth Engine

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S D Prabu Ragavendiran ; NR Gowthami ; Gayathri C ; D. Ramya ; D. Padmapriya ; S.V. Suji Aparna **All Authors**

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Abstract:
Classification of satellite images using Google Earth Engine entails identifying features on the satellite images to classify the land cover in a particular region through the use of deep learning algorithms. Such a process contributes to monitoring the environment and geographical distribution of resources, planning of cities, and management of resources. However, in many existing approaches, some challenges are worth noting. To address these challenges, this study introduces a new approach, the Dual Temporal Channel Convolutional Network with Exponential Distribution Optimizer (ANDualTCCNet+EDO) for satellite image classification using Google Earth Engine. This approach uses satellite imagery from the Landsat 8 Surface Reflectance dataset, with the input images preprocessed through the Adaptive Tri-Plateau Limit Tri-Histogram Equalization Algorithm (ATri-PLTri-HEA) technique. Following preprocessing, features are extracted from the images using the DenseNet201 method. Then, classification is carried out by A Novel Dual Temporal Channel Convolutional Network (ANDualTCCNet), optimized by the Exponential Distribution Optimizer (EDO) for precise satellite image classification in Google Earth Engine (GEE). The ANDualTCCNet+EDO method is implemented in Python. The proposed method was evaluated using the Landsat 8 Surface Reflectance dataset, achieving a high accuracy of 99.8%, surpassing existing methods. The results presented in this paper show that the use of this method allows for the accurate classification of satellite images in Google Earth Engine. The outcomes of the proposed method improve the method of satellite image classification in Google Earth Engine. This model captures both short- and long-duration temporal characteristics, therefore enhancing spatial-temporal feature acquisition compared to the previous method used in the classification of land cover, especially for temporal dynamics of land covers with different seasonal changes.

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Optimizing Image Quality and Information Content with NSCT -PCNN Fusion for Medical and Remote Sensing Image

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ABSTARCT:

Multimodal image fusion is essential in many areas like medical imaging, remote sensing, as well as surveillance. Image fusion is the method of merging several images obtained from different sensors or modalities, resulting in a composite image with enriched information compared to individual input images. The classification of image fusion techniques comprises spatial domain fusion and frequency domain fusion. The objective of
image fusion is to optimize the quality, clarity, and informative content of the resultant image. This work proposes a multimodal medical image fusion algorithm and a remote sensing image fusion algorithm. For decomposition of two input images, we employed Non-Subsampled Contourlet Transform (NSCT) for remote sensing images and Non-Subsampled Shearlet Transform (NSST) for medical images. Incorporating these two decomposition techniques, input images broken down into LF and HF sub-bands, and facilitating the extraction of features across multiple directions. For the fusion of these LF and HF sub-bands, PCNN based fusion rule is used. Dual-Channel Pulse Coupled Neural Network (DCPCNN) is employed for its better fusion effect. Using the resultant integrated image, diagnosis, and environmental monitoring can be done precisely and also helps in reducing storage space for preserving multiple images. The experimental outcomes demonstrate that the suggested algorithms perform in their applications and attains promising results.

Keywords- Multimodal image fusion, NSCT, NSST, WPADCPCNN, PAUDPCNN

1. INTRODUCTION:

Multimodal image fusion refers to the procedure of merging data from numerous photographs of the identical scene, taken by distinct imaging sensors or modalities, in order to get a solitary, more enlightening image. Medical imaging encompasses various modalities such as X-ray, MRI, CT, SPECT, PET and more. Image fusion in health imaging plays an imperative role in improving diagnostic accuracy and aiding medical professionals in their decision-making processes. The two main types of images in the field of medical imaging are typically categorized as anatomical and functional. An organ's anatomical structure can be determined using MRI, while functional techniques for image analysis include PET and SPECT [1].

Remote sensing involves the collection of data and imagery from satellites, aircraft, or drones to monitor the Earth's surface. These images can be categorized based on the electromagnetic spectrum they capture, including visible, infrared, and microwave wavelengths [2]. Remote sensing image fusion plays a crucial role in various fields such as agriculture, forestry, and disaster management.

The Non- Subsampled Contourlet Transform (NSCT) and Non- Subsampled Shearlet Transform (NSST) approaches have shift invariance characteristics, which help our strategy be implemented around the limitations found in alternative fusion rules [3,4]. Both NSCT and NSST are used for image decomposition. The choice between NSCT and NSST may depend on the specific characteristics of the images and the desired emphasis on contours or directional features in the fused result.

Pulse-Coupled Neural Networks (PCNNs) are commonly employed in image fusion frameworks due to their capacity to achieve global synchronization of neuron pulses [5]. This study presents two fusion methods: The proposed method

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IOT Based Automated Indoor Hydroponic Farming System

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Mitigating Partial Shading Effects in Photovoltaic System using Intelligent Current Compensation Method

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Abstract. Efficiency of photovoltaic (PV) systems is decreased by mismatch losses resulting from uneven panel irradiation. Current compensation techniques that inject compensatory current and measure currents by periodic row short-circuiting are unavoidably blackout-causing. In this work, a novel current compensation technique is presented that dynamically measures and reacts to variations in irradiance using light sensors on each panel. The program compiles these data to determine the overall irradiance of each row and to precisely modify the injected current to sustain output without any interruptions to operation. The proposed approach lowers mismatch losses more effectively than traditional techniques, as demonstrated by MATLAB/Simulink simulations of seven shading patterns. Under center shading, the proposed approach raised system efficiency by 36%. These results indicate a move towards more flexible solar energy solutions by implying that sensor-driven data analytics can increase PV system operational efficiency and reliability.

1 Introduction

Renewable energy innovations solve carbon emissions and fossil fuel depletion [1], [2], [3]. Development usually favors renewable energy sources with simple harvesting and low harvesting costs. Solar energy conversion (SEC) has fewer drawbacks than direct implementation and rural electrification. SEC systems collect it using photovoltaics and solar thermal conversion. Solar photovoltaic conversion is an efficient and environmentally friendly way to electrify rural areas. Solar PV systems convert sunlight into electrons using the photovoltaic effect [4]. Commercial applications included polycrystalline, monocrystalline, thin-film, bifacial, and photovoltaic buildings [5].

PV cells are arrayed by power need. Array topologies are classified as series-parallel or module interaction. Mismatch losses are the biggest concern in array construction. This mismatch loss is caused by PV module power generation differences. Photovoltaic (PV) systems also suffer from partial shade, hotspot, delamination, degradation, diode failure, string burning, and isolated PV cells or modules that cause mismatch losses across PV array rows [6], [7], [8]. PV modules and row creation generate electricity, which affects PV array power output. Due to these factors, some rows generate the rated power and others less. The power difference between healthy and defective PV rows is called MLs. When PV is integrated into the grid, it affects grid stability until the PV generates the expected power [9]. To reduce mismatch losses, MPPT, array configuration, PV array reconfiguration, and current compensation are being investigated. Previous MPPT versions used perturb and observation. Later, incremental conductance MPPT methods were developed. However, partially shaded photovoltaic (PV) systems produce power (P)-voltage (V) and current (I)-voltage (V) curves that are not smooth [10], [11]. A non-smooth curve may have many local maximum power points. There are many maximum power points, making it hard to determine the Global Maximum Power Point (GMPP). The majority of MPPT algorithms produce inefficient GMPPs. MPPT optimizes and uses soft computing to improve performance. MPPT is used in fuzzy logic control, neural networks, AI, ant colony optimization, particle Swarm optimization, and more. [12]. Tracking the MPPT fails to track the GMPP in difficult situations. The MPPT cannot distribute shade throughout the PV array, another drawback. Besides mismatch loss reduction, PV array reconfiguration is an option[6], [13], [14]. This uses dynamic switching circuits to change PV module interconnections to spread faults across an array [15]. This technology is expensive because it uses sensors, switches, and other controls [16], [17]. External power compensation sources are connected to each panel or row simultaneously to compensate for power loss [18]. Thus, array mismatch

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Efficient power system operation through fuzzy and PSO algorithm for power loss reductions and voltage profile improvement by optimal placement of D-STATCOM

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Abstract: This research aims to enhance voltage profiles and minimize power losses. in power systems through the strategic use of Distribution Static Compensators (DSTATCOM). Fuzzy Logic and Particle Swarm Optimization (PSO) work in concert to enhance the optimization process. Using a thorough testing framework, the paper assesses the suggested methodology on two different power system models, comprising 33 and 69 buses. Normal operating conditions and variations at 125%, 150%, and 175% of the nominal load are included in the testing scenarios. This rigorous testing regimen offers a comprehensive evaluation of the algorithm's performance and robustness under various operating scenarios. The purpose of placing the DSTATCOM devices strategically inside the electrical grid is to decrease power losses and enhance system voltage profiles. Uncertain. While the PSO algorithm maximizes the effectiveness of DSTATCOM unit placement, logic is used to tackle the inherent uncertainties and imprecisions in the power system. Under varied load conditions, this work demonstrates a major improvement in voltage profiles and a large reduction in power losses.

1 Introduction

The goal of efficiency, dependability, and sustainability is still crucial in the dynamic world of power systems. The proper operation of power distribution networks is becoming increasingly important as societies continue to rely on electricity as a cornerstone for development. Reducing power losses and increasing voltage profiles are two critical areas of power system management that are the focus of this research. Power interruptions in distribution cause environmental problems in addition to financial inefficiencies. Similarly, it's critical to maintain a steady and ideal voltage profile to guarantee the smooth operation of electrical gear and appliances. The implementation of cutting-edge technologies is crucial in this situation, and Distribution Static Compensators (D STATCOM) is one of the main players in the race for better power system performance.

This study attempts to determine the best way to strategically place DSTATCOM devices with regard to minimize power loss and improve voltage profile. Finding these compensators at the network's most advantageous locations is a difficult task, though. Power systems are dynamic and complicated, making traditional approaches inadequate to handle their needs. Therefore, modern optimization techniques must be integrated.

To address these issues, the study suggests a novel strategy that blends fuzzy logic and the Particle Swarm Optimization method. With regard to modeling and controlling decision-making processes, fuzzy logic offers a solid framework that takes into account the inherent uncertainties in power systems. Simultaneously, the PSO algorithm provides an effective way to search the large solution space and find ideal placement configurations. It draws inspiration from group behaviors observed in nature. The goal of this research is to support current efforts to convert power systems into extremely efficient, dependable, and adaptive networks by combining the strengths of PSO with fuzzy logic in a synergistic way. The upcoming sections will address the theoretical foundations, methodology, and empirical findings in details. They

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Real Time Monitoring and Analysis of String Faults in Solar Plant Using IoT

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Abstract. Monitoring solar power facilities closely is crucial for maximizing power output. This involves vigilant oversight to detect issues such as faulty connections, malfunctioning solar panels, and dust accumulation that hampers efficiency. To facilitate seamless integration with photovoltaic (PV) systems and pinpoint faults, this project unveils the hardware architecture of a smart grid home gateway. The proposed solution is an automated Internet of Things (IoT) based solar power monitoring system, allowing remote monitoring of solar power performance via the internet. Utilizing an Arduino-based system integrated with CT and Voltage sensors, the project measures and monitors various solar panel properties. Faults are identified by comparing the recorded voltage of the panels with the data from the Voltage sensor. The solution efficiently communicates power output to the IoT system over the internet, ensuring continuous monitoring of solar panel performance.

1 Introduction

One of the most pressing issues facing our society right now is power usage. The initiative is cantered on the crucial problem of energy use. Certain non-renewable energy sources, like nuclear and thermal energy, are expensive and hazardous to human health. Conventional energy sources harm the environment and have a limited supply. The best solution to these problems will be an environmentally friendly system. This project aims to keep an eye on and control the voltage output of a solar panel that is stored in a faraway location. Monitoring the server's output via the Internet of Things (IOT). The server page, which has its own IP address, is used to reach the output page. Relay boards and circuits make the process of regulation and monitoring easier.

This technology facilitates the process of monitoring and controlling in an easy and effective manner.

The sensors send data to a consolidated local sink integrant made up of an ad hoc Wireless Sensor Network framework in order to create a strong and wide coverage area. The information is transmitted to an IOT server, wherein targeted diagnostic methodologies are executed. This technology facilitates the process of monitoring and controlling in an easy and effective manner.

The rapid rise of solar parks as one of the primary sustainable power frameworks highlights the urgent need for better utilization of the services they provide, as well as errors in detection and execution. Non-trivial parameters like voltage are monitored continuously at the board level and prepared in a cloud-based stage to detect these events early in order to achieve this.

The increasing popularity of solar panels as one of the primary sustainable power systems has created a pressing demand for more efficient use of the services they provide, as well as mistakes in placement and implementation. The goal of Internet of Things (IoT) technology is to close this gap by offering long-term, low-cost solutions for the efficient operation of solar parks.

1.1 Literature Review

"IoT-Based Smart Solar PV System for Energy Management and Monitoring" Bansal et al., 2018. Several studies demonstrate how IoT can be used to monitor and control solar PV systems. Real-time data on energy generation, string performance, environmental conditions, and equipment health can be gathered by IoT devices.

Salameh et al. (2017) "A Survey of Fault Detection, Isolation, and Diagnosis in Photovoltaic Arrays" String defects that cause panel deterioration, soiling, or shadowing can drastically lower a solar PV system's

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Enhancing Power Quality in Integrated PV Systems and DFIG Systems through MPPT and Fuzzy logic controller for Grid Systems

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Abstract. This article investigates incorporating solar energy into a grid connected system or process—Photo-Voltaic (PV) and Double Fed Induction Generator (DFIG) systems aimed at improving energy efficiency. Because of its lower efficiency, successfully using the power from solar PV connected to the utility grid is a challenging operation. The hybrid system operation is optimized using a Fuzzy Logic Controller (FLC), which effectively manages the variability and intermittency of renewable sources. The FLC dynamically adjusts parameters to ensure seamless grid integration and power quality enhancements. The study compares the FLC's performance with the Incremental Conductance method, evaluating their ability to manage the hybrid system's components under diverse environmental conditions. Key focus areas include voltage regulation, frequency stability, and harmonic distortion mitigation. A power point tracking controller's primary function is to increase or maximize solar systems' power generation. This proposed method includes a presentation of a fuzzy controller with Maximum power point tracking (MPPT) for a 10 kW-PV grid connected systems, highlighting its advantages over the Incremental Conductance method (Inc-Con). The output results are verified and validated with MATLAB Simulink platform.

1 Introduction

As global demand for renewable energy solutions continues to grow, non-conventional energy sources such as solar photovoltaic and wind power are vital for cleaner, more sustainable energy. The PV panels will convert solar energy in to DC electric energy [1]. However, their integration poses a challenge due to their instability, inconsistency and less efficiency [2]. Researchers developed a combination of an MPPT controller and a photovoltaic energy converter. Solar photovoltaic energy is environmentally friendly, requires less maintenance [3, 4], and has 15-25% efficiency. Large wind turbines using DFIG with back-to-back converters can vary their operating speed with only 20-30% of the electricity generated through the converters. Always check for attacks on DFIG systems. To improve power efficiency and connect the solar-wind hybrid power system to the grid, this work presents a fuzzy logic controller for the DFIG control system using d-q separation rotor current vector control. The controller constantly adjusts the system settings in real-time to optimize the system's performance, ensuring a steady and harmonic connection with the grid. The research also highlights the importance of continuing to use multiple energy sources simultaneously, including wind at night, to meet consumer demand. The ultimate goal is to increase the energy efficiency of hybrid systems by taking advantage of photovoltaic and wind energy features.

Control of the variable speed of generator induction (DFIG) by PWM converter on the rotor side is proposed using fuzzy logic-based rotor flux-oriented vector control to control rotor current. A fuzzy logic controller and PI controller are used to control the rotor current to overcome all disturbances. Simulations were created in MATLAB Simulink. [5]. Simulating the doubly fed asynchronous generator (DFIG), the main wind turbine used for wind power generation, and its role in managing active and reactive power in the network is presented. Uses MATLAB Simulink for design and simulation. [6].Network control has been improved, especially when photovoltaic energy enters the low-voltage distribution network. It uses D-STATCOM in FACTS devices to improve power control and power stability. Use MATLAB SIMULINK to assess the effectiveness of your system. Research and evaluation of standards in various fields of work. [7].

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Advanced Power Quality in Hybrid PV-Wind Systems with TSK Fuzzy Control

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***Abstract*—Off-grid setups struggle to keep power flowing steadily, especially at night and when wind speeds vary. To tackle this, a mix of solar panels, wind power using a special generator, and a battery form a new kind of power grid called a Microgrid. Since both solar and wind make DC power, a converter joins them onto one line and manages their output. Then, this combined line connects to regular electric devices through an inverter, making it easy to use with existing power systems. This work proposes a method for microgrid controlling that makes use of Takagi-Sugeno-Kang (TSK) fuzzy control devices to guarantee that users receive quality electricity. The proposed controller maintains stable voltage levels for both AC and DC loads during disturbances, thereby enhancing power quality by minimizing total harmonic distortion and frequency fluctuations. Moreover, it facilitates power balance by regulating the flow between the battery and the system. The system's performance is assessed using MATLAB modeling and hardware-in-the-loop (HIL) simulation with OPAL-RT modules.**

Keywords— DFIG,Renewable Energy, TSK-Fuzzy, Grid Connected System,HIL, OPAL-RT.

I. INTRODUCTION

Electricity is vital for societal progress and is considered a basic necessity in many countries, including India. Ensuring reliable power supply is crucial for optimal functioning of various electrical devices. However, numerous areas still lack access to the main power grid, requiring standalone systems to meet their electricity needs, particularly in isolated locations like institutions and hospitals. Although diesel generators have traditionally been used in such cases, their environmental and health impacts highlight the need for alternative solutions. Solar and wind energy offer sustainable options and are widely available. This papers [1-4] proposes a hybrid standalone system that combines Photovoltaic (PV) panels and Permanent Magnet Synchronous Generator (PMSG) wind turbines. By strategically placing multiple PV and wind systems, a medium-power supply network is established. These systems are interconnected via converters to create a standardized DC-link, with converters acting as Maximum Power Point Tracking (MPPT) devices. Precise control algorithms ensure efficient current injection into the DC-link. Moreover, inverters are utilized to provide AC power to loads and regulate the voltage of the DC-link [5-8].

Where as in [9–10] Network dependability may be greatly improved by connecting many producing units to a shared DC-link. However, the generation of power from PV and wind systems is contingent upon unpredictable environmental factors such as sunlight and wind speed, resulting in potential imbalances between generation and load. Instead of directly connecting it to the DC-link, connecting the battery bank to the AC bus via an inverter offers several advantages, particularly in systems with multiple generating units. An inverter that's connected to the DC-link as well as a different to the AC bus are both required by this configuration [11–14]. The effective management of the charging and discharge operations also requires a dual DC to DC converter to be utilised. In this paper, innovative control schemes for these components, including two inverters and a bidirectional converter, are proposed. In [15-16] Traditional Proportional-Integral (PI) controllers may struggle to respond effectively to rapid system changes due to their fixed gains. In contrast, Takagi Sugeno Kang (TSK) Fuzzy controllers offer superior adaptability, making them the preferred choice for ensuring optimal performance under varying conditions. In order to obtain enhanced efficiency in all operating settings, the suggested control approaches use TSK Fuzzy actuators. The subsequent sections of the paper outline the system configuration, the design and significance of TSK Fuzzy controllers, the proposed control strategies for inverters and bidirectional converters, the analysis of results using Hardware in the Loop (HIL) simulations, conclusions, and references[17-18].

II. PROPOSED STANDALONE SYSTEM

Imagine a scenario where various sources of power, such as wind turbines and solar panels, collaborate to create a robust network of energy through a shared DC-link. This network, known as a DC Microgrid, holds the promise of becoming a dynamic hub of energy distribution. However, amid this potential lies a challenge: the voltage levels within this grid can fluctuate unpredictably, disrupting the flow of energy. To overcome this hurdle, it becomes imperative to introduce a mechanism that can regulate these voltage

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Fruit Fly Algorithm Optimised Degree of Freedom Controller for the Dynamical Stability of the Renewable Energy Penetrated Multi Area Power System

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Abstract. The stability and maintenance of the renewable energy penetrated multi-area power system (REPMAPS) are so complex. To ensure the optimal functioning of the complex interconnected power system (IPS), an automatic controller is necessary for the proper load frequency control (LFC) actions. For this, a three-degree-of-freedom proportional-integral-derivative (3DOFPID) controller is suggested in this work for simultaneous frequency regulation. However, the parameters of the 3DOFPID controller are to be ascertained using soft computing algorithms to obtain better performance. The fruit fly algorithm (FFA) is implemented in this paper for the fine-tuning of the 3DOFPID controller, and the efficacy of the FFA is demonstrated with other algorithms in the literature. Besides, the analysis of REPMAPS is deliberated with communication time delays (CTDs) as the practical constraint, and their effect on the system's dynamic performance is showcased. Further, the REPMAPS is operated with the territory strategy of capacitive energy storage (CES) and the static synchronous series compensator (SSSC) to improve the system performance. The simulation study confirmed the enhancement in REPMAPS performance with the CES-SSSC strategy.

1 Introduction

In the modern scenario, the IPS is becoming extremely challenging with regards to load demand and the quality of power delivery. The emergence of the newest technologies, including smart grids, sophisticated micro-grids, and the integration of multi-type renewable energy sources (RES), caused a significant transition in the IPS networks. With the RES interconnection, the penetration of the real power into the IPS is unpredictable, and moreover, the IPS is facing challenges and several uncertainties in balancing the load demands. The necessity of a highly reliable IPS network and steadiness in the generation of real power is growing fast, as small deviations in the load can trigger system frequency deviations. The severe load fluctuations in any control region would also affect the power flow among the neighbouring areas and the operation of IPS network [1]. This exhibits the importance of maintaining load frequency regulation in electrically interconnected networks.

Hence, an efficient controller is required to safeguard the electrical network from the sudden rise in load variations and unplanned events. The literature survey disclosed the bulk of the of the research work that had been reported in suggesting a sophisticated regulator for the operation of the electrical network. Most of the work is reported based on the implementation of the PI and PID controllers. However, the operational efficacy of these controllers is tested on different IPS networks with and without RES penetration, and the details are reported extensively in [2]. The optimization algorithms are required for the PI/PID controllers to perform the optimal operation in ensuring the electrical network's stability. The authors had utilized the algorithms of spider monkey optimization, arithmetic optimization approach, hybrid artificial electric filed algorithm [3], African vulture algorithm, backtracking algorithm, bird swarm algorithm, whale optimization [4], crow search technique [5], cooperative approach, eco search technique, squirrel search algorithm [6], cryogenic optimization approach, chimp optimizer [7], slap swarm algorithm, COOT optimization [8], Aquila approach, bat algorithm, consultant guided algorithm, coyote technique [9], glow worm algorithm, jellyfish technique, locality projection algorithm, metal annealing, political optimization algorithm etc. for fine-tuning of PI/PID controllers. But the PI/PID [10] regulator operation can be inferior to the electrical networks with the generation rate constraint (GRC) and governor dead band (GDB) features.

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Water Cycle Algorithm Tuned Cascade Controller for the Frequency Control of a Nonlinear Hydrothermal Power System with PEV Integration

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Abstract. In this paper, a new cascade (C) fractional order (FO) proportional-integral-derivative (PID) and proportional-integral (PI) (CFOPID-PI) controller is designed based on the optimization technique of the water cycle algorithm (WCA) for the frequency regulation of plug-in electric vehicles (PEVs) integrated dual area non-linear hydrothermal (DANLHT) system. The PEVs integrated DANLHT system has two areas: thermal, hydro, and PEVs integration, and the system dynamic analysis is initiated for the step load disturbance (SLD) of 10% in area 1. However, the performance efficacy of the proposed CFOPID-PI controller is demonstrated by the performances of other reported controllers in the literature. Further, the impact of considering the PEV integration on the performance of the DANLHT system is showcased. Furthermore, the high-voltage direct current (HVDC) line is enacted as the tie-line with the PEVs integrated DANLHT system to obtain an improvement in system dynamical behavior. Simulation analysis revealed an enhancement in system performance with the deployment of the HVDC line as the tie-line with the PEVs integrated DANLHT system.

1 Introduction

In A very well-acknowledged ancillary service that is available for the stability of the electrical network is load frequency control (LFC). It plays a significant role in handling the dynamic variations in electrical network performance that arise from deviations in electrical demand. In general, the electrical network consists of multiple types of generation units, and all the units are running in synchronism and are operated at the same frequency. This electrical network is technically termed the interconnected power system (IPS), and the generation units are segregated into the control regions. The interconnection between the regions is established with the tie-lines to help the power exchange from surplus to deficit regions. The deviations in the IPS frequency arise from the real power mismatch (RPM) that has been created between demand and generation. The RPM can directly affect the IPS frequency, and hence a greater concern has to be given to establishing the electrical system's stability. Moreover, the changes in load in any control area would cause deviations in the performance of the other control regions, and hence the governing of the RPM in the complex IPS is not very simple. However, this issue can be addressed to a greater extent by the LFC by performing the automatic regulations in compliance with the varying load demands.

Several automatic LFC strategies have been reported in great detail so far by the researchers, and the efficacy of the suggested strategies has been tested on different power system networks. In [1], PID is enforced for analysis of the dual area renewable-based electrical system, and the enhanced whale optimizer is utilized for parameter tuning. The generation rate constraint (GRC) for the units is not deliberated. The flower pollination algorithm-tuned PID is suggested as an as an isolated network with multiple sources of generation units in [2]. For the optimal operation of the nuclear and renewable-based dual area IPS, the researchers in [3] presented the teaching learning optimizer tuned PID as a frequency regulator, and moreover, in [4], the PID and the PID plus double derivative (PIDD) are adopted in the dual area IPS. The PID rendered with the Archimedes optimization approach is adopted to address the frequency fluctuations in the IPS, and the governor dead band (GDB) for thermal plants is conceived in [5]. Apart from these, various algorithms like the bee hive algorithm, the artificial chimp optimizer, the spotted hyena approach, the wind-driven algorithm, the lion optimization, the human-inspired algorithm, the goat optimization, etc. have been reported [6] recently for the parameter optimization of the PI/PID controllers.

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An Efficient Shortest Path Optimized Algorithm For Vehicle Adhoc Networks System

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***Abstract*— VANET (Vehicular ad-hoc network) is a network of advanced automobiles designed to solve the problem of mobility and, as a result, reduce the number of accidents. Because VANET is a type of MANET (mobile ad hoc network) surrounded by human-driven nodes, the social concept can be used to explain VANET routing decisions. This motivates academics to look into the possibilities of using Social Network Analysis (SNA) to create routing strategies. The most critical problem in any system is parcel drop. Social characteristics-based architectures encounter comparable challenges, resulting in inefficient message delivery. In this research, the dragonfly method is used to the shortest path methodology for fixed line VANET with the purpose of reducing package drop and increasing network reliability. This is made achievable by sculpted system of values centralization analysis, which improves the decision via dragonfly optimization methodology. The behavior of the using nodes capability then be determined by the importance computation. In this study, the sustainability of the optimized shortest path system is measured in terms of End to End delay, Energy Consumption, Packet Loss, and Throughput. The dragonfly algorithm's throughput evaluation is 650 kbps as compared to the traditional way.**

Keywords—VANET, SNA, MANET, Dragonfly and Clustering.

I. INTRODUCTION

Vehicle Adhoc Networks (VANETs) are essential for facilitating effective communication between cars and infrastructure components in the context of contemporary transportation systems [1]. VANETs allow automobiles and roadside devices to communicate vital information more easily, including traffic updates, road conditions, and safety alerts. The development of routing protocols to enable prompt and dependable communication while taking into account the dynamic nature of vehicular surroundings is one of the core difficulties in VANETs. VANET routing algorithms need to handle a number of important issues, such as high mobility, sporadic connection, bandwidth constraints, and changing network topologies [2, 3]. The shortest path algorithm is a key method for figuring out the most effective route between a source and destination in a network, among other routing techniques. The static nature of classic shortest path algorithms, such Dijkstra's or Bellman-Ford, prevents them from being directly used to VANETs, as they are unable to adjust to the dynamic environment of vehicular networks [4, 5]. Our solution to these problems is a novel and effective shortest path optimization technique designed especially for VANETs. Our algorithm takes use of vehicle networks' special qualities to improve routing flexibility and efficiency [6, 7]. In real-time, our system dynamically determines the best route between source and destination nodes by taking into account variables like vehicle speed, traffic density, road conditions, and communication range. Salient characteristics of our dynamic path computation algorithm: In order to provide flexibility in response to shifting circumstances, our system constantly modifies the network architecture and recalculates the shortest path using real-time data. Routing that Considers Traffic Density and Congestion: Our algorithm chooses routes to reduce latency and enhance network performance by taking these factors into account. Predictive modelling approaches are used by our system to forecast vehicle mobility, which allows it to proactively modify routing decisions and lessen the impacts of high mobility [8, 9]. Optimization of Communication Range: Taking into account the vehicles' restricted communication range, our method selects intermediate nodes optimally in order to provide dependable communication linkages throughout the route [10, 11]. Energy Efficiency: Our method improves route selection and reduces the amount of control messages to minimize communication overhead, extending the network lifetime and saving vehicle energy. We provide a thorough explanation of our proposed method in this work, together with its algorithmic design, guiding principles, and performance assessment based on several simulations. Our experimental findings show that the proposed algorithm is more efficient and effective than previous methods in terms of packet delivery ratio, end-to-end latency, network scalability, and routing efficiency. In conclusion, our effective shortest path optimized method presents a viable technique to improve the efficiency and dependability of communication in Vehicle Adhoc Networks, opening the

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Power Management and Control for PV integrated Microgrid with Battery Energy Storage System

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M. Bala Siva Prasad ; P. Bala Chennaiah All Authors

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113 Full Text Views

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II. Description of System

III. Control Strategies

IV. Simulation Results and Discussion

V. Conclusion

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Abstract:
With increasing demand for energy, sustainable development, renewable energy sources, or (RES) is an option. The integration of RES into power grid structure is quite challenging due to intermittent nature leads to solution of microgrid (MG). The proposed work is on different modes of Grid-Following to Grid-Forming operation, followed by a resynchronization to grid, solar plant curtailment, ancillary services like P&Q control, imbalance correction for improving the power sharing Capability and Grid-following and grid-forming are the two BESS operating modes that are made possible by the reduction of frequency variation between the grid and microgrid. To effortlessly re-connect the microgrid to the distribution system, a resynchronization with the grid is also carried out. MAT-LAB/Simulink is used to model the system.

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I. Introduction

In developed and developing countries conventional energy generation are replaced by sustainable energy technologies[1]. For global warming, climate change and fossil fuel-based generation RES like solar, wind sources are introduced for generation of electricity. The objective of deploying RES is to improve energy security, to give access to energy, afford-able energy[2]. Due to intermittent nature of RES, to balance supply and demand integration RES are required. The integration of RES is throwing challenges for researchers including variability, uncertainty and intermittency[3]. Microgrids is one of the solutions for intermittency in RES which comprises distributed energy resources, storage devices. The proposed work is based on hybrid energy storage systems regarded as combination storage systems. Hybrid energy storage systems (HESS) are energy storage systems combine two energy storage technologies to yield necessary performance by combining relevant properties of various technologies. Because single ESS technologies have limitations with regard to longevity, cost, energy and power density, dynamic response, they are unable to perform intended function in isolation[4]. Hybrid systems are regarded as an effective field of study for energy storage systems because of their superior output efficiency, excellent charge creation in any environment. HESS addresses challenges of charging/discharging, increasing temperature, manufacturing cost. High eneSign in to Continue Readingmbined in HESS to supply peak powers. Power quality, stability can be improved with HESS. HESS should be managed for grid steadiness, effectiveness. The proposed system consists of Solar Panel, Battery management system(BMS),bi directional DC/DC converter, AC load. The bidirectional DC-DC converter converts source of direct current from one level to another level. The proposed system which is shown in figure 1consisting of RES with Maximum Power Point controller which can extract maximum power from PV module to make them operate at most efficient voltage. A lithium-ion battery is a is utilised in proposed design. The Hybrid Energy management system is to improve power output and also to reduce load on Li-ion battery[5]. When there is plentiful supply, battery charges; when there is excess of supply, it releases its stored energy. Hybrid power system utilizes more than one RES[6]. The General

Multi Agent System Based Control for Energy Management of Hybrid Microgrid System

Publisher: IEEE

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Praveen Kumar Reddy K ; Balachennaiah Pagidi **All Authors**

79
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Text Views

Abstract

Document Sections

I. Introduction

II. Hybrid Microgrid System

III. Multi Agent System Technology

IV. Jade (java Agent Development framework)

V. Problem Formulation

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Abstract:
Microgrids are decentralized power generation systems installed on customer premises, incorporating various capacity generating sets and modes. These systems not only cater to the specific energy needs of the consumer but also contribute excess power back to the main grid. Often integrating renewable sources like solar PV cells, wind energy, and battery energy -storage systems, microgrids have gained global popularity due to their potential for compact size and adaptable configurations. To ensure stable operation amidst the diverse array of power sources, a Multi-Agent System (MAS) is employed. This MAS is specifically designed for modeling and autonomous decision-making. The study concentrates on a microgrid, equipped with 1.5 kW wind energy, 1 kW solar PV power, a battery (24V 150Ah), and a local electrical load. Together, these components develop the Hybrid Microgrid System (HMGS). The simulation design is constructed using the Java Agent Development Environment (JADE), enabling effective management of the heterogeneous system components. The primary objective is to investigate the performance and reliability of the HMGS, with a particular emphasis on the crucial role played by MAS in coordinating the intricate interplay of various power sources to achieve sustainable and efficient operation.

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I. Introduction

The contemporary global energy demand landscape grapples with an enduring challenge underscored by the escalating necessity for energy juxtaposed with the depleting resources of conventional fossil fuels. In response to this predicament, a prevailing paradigm involves a departure from fossil fuels in favor of the assimilation of micro-grids powered by renewable energy sources [1]–[2]. A micro-grid, seamlessly integrated into electrical power distribution system, encompasses modest [illegible] tailored for electrical local loads, exhibiting the capability to function autonomously or in conjunction with the primary grid [3]. The overarching objective is to attain equilibrium between demand and supply, effectuate cost reductions, and refine energy procurement and storage facilities. Given the intermittent and low inertia characteristics inherent in micro-grids [4]

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Facial Sentiment Analysis: Enhancing Emotion Recognition Through Advanced Convolutional Neural Network Architectures

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***Abstract*—The domain of Computer Vision has observed the emergence of Facial Sentiment Analysis as a critical area, elucidating human emotions expressed through facial features. This investigation focuses on emotion recognition, specifically emphasizing the utilization of advanced Convolutional Neural Network (CNN) architectures to enhance the precision and efficacy of sentiment analysis. Despite considerable advancements, robust development of facial emotion recognition systems encounters persistent challenges. A primary hurdle involves addressing the inherent variability in human facial expressions, shaped by cultural, individual, and contextual influences. Overcoming the complexities associated with cross-cultural and cross-demographic generalization demands innovative solutions. Additionally, the scarcity of extensive and diverse annotated datasets poses a challenge in building highly generalized models. This study explores strategies to tackle these challenges, employing transfer learning techniques and data augmentation methods to bolster model generalization. Furthermore, the application of facial sentiment analysis in real-world scenarios necessitates models that not only ensure accuracy but also provide interpretability and explanation. The research delves into methods to enhance model interpretability, offering insights into the decision-making processes of neural networks, thereby fostering trust and acceptance in practical applications. Through a comprehensive examination of these challenges, this research contributes to the ongoing advancement in facial sentiment analysis, paving the way for more reliable and universally applicable emotion recognition systems.**

Keywords— Facial Sentiment Analysis, Convolutional Neural Network (CNN),Emotion Recognition, Generalization, Transfer Learning, Model Interpretability

I. Introduction (*Heading 1*)

In the rapidly evolving landscape of Computer Vision, the burgeoning field of Facial Sentiment Analysis has become integral, offering profound insights into the intricate realm of human emotions expressed through facial features. As technology advances, the precision and efficacy of emotion recognition systems have become focal points for improvement. This study embarks on a comprehensive exploration of this domain, placing particular emphasis on the utilization of advanced Convolutional Neural Network (CNN) architectures to elevate the accuracy and effectiveness of Facial Sentiment Analysis.

Despite considerable strides in recent years, the development of robust facial emotion recognition systems encounters persistent challenges. A critical hurdle involves navigating the inherent variability in human facial expressions, influenced by cultural nuances, individual differences, and contextual factors. Tackling the complexities associated with cross-cultural and cross-demographic generalization demands innovative solutions. Furthermore, the scarcity of extensive and diverse annotated datasets poses a hindrance to creating models with high generalization capabilities. This research strategically addresses these challenges, employing cutting-edge techniques such as transfer learning and data augmentation to enhance the generalization of facial emotion recognition models.

In addition to technical challenges, the study recognizes the practical demands of applying facial sentiment analysis in real-world scenarios. Beyond delivering accuracy, the models must also be interpretable and explainable. The research u to unravel the decision-making processes of neural networks, providing insights that enhance trust and acceptance in practical applications. By dissecting and addressing these multifaceted challenges, this research contributes to the continual advancement of facial sentiment analysis, envisioning a future with more dependable and universally applicable emotion recognition systems.

II. Literature Review

In the ever-evolving realm of Computer Vision, Facial Sentiment Analysis stands out as an essential discipline, deciphering the nuanced expressions of human emotions conveyed through facial features. With technological advancements, the pursuit of accuracy and efficiency in emotion recognition systems has become increasingly important. This review delves into a thorough examination, particularly emphasizing the utilization of advanced Convolutional Neural Network (CNN) architectures to amplify the precision and effectiveness of Facial Sentiment Analysis[1-2].

The historical development of Facial Sentiment Analysis can be traced back to pioneering contributions by Ekman and Friesen (1971), establishing the groundwork for comprehending universally recognized facial expressions and paving the way for subsequent research in automated emotion recognition[3-4].Conventional methods that depend on manually crafted

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IEEE 2024 5th International Conference on Circuits, Control, Communication and Computing (I4C)
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Design of Transcutaneous Electrical Nerve Stimulator Machine for Chronic Low Back Pain

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Abstract*— Using electrical current to stimulate and excite a living body's nervous system is known as Transcutaneous Electrical Nerve Stimulation(TENS). The word electrotherapy has been used to describe a wide range of medical procedures, including shock therapy and the use of devices like deep brain stimulators for neurological disorders. The use of electrical current to accelerate the process of healing of wounds has also been included in this definition. This treatment also belongs to alternative medications in particularly for spinal cord and remedies because it is non-pharmacological. It acts as a nonpharmacological therapy that minimizes hyperalgesia by descending inhibitory mechanisms in the nervous system's center, which in turn stimulates a complicated neural network that decreases pain. To control pain, TENS devices apply electrical current through electrodes applied to the skin to provide a non-invasive nerve stimulation system that can reduce acute and chronic pain. This paper describes the development, implementation, and maintenance of a system that may be used to treat illnesses at a relatively low cost. The user can also vary the system's frequency from low to high depending on the intended purpose.

Keywords*— Electrotherapy, High Pulse Frequency, Low Pulse Frequency, Nerve Stimulation, Neurological Disorders, TENS.

I. INTRODUCTION (*HEADING 1*)

A transcutaneous electrical nerve stimulator, also known as a Transcutaneous Electrical Nerve Stimulation (TENS) machine, is a device that stimulates and excite the peripheral nervous system of the human body using two electrodes that are attached to the body's surface [1]. It uses electrical current at specific frequencies to reduce both acute and chronic pain in different body parts [2]–[5]. Modulating pulse width, frequency, and intensity is possible with this common battery- powered TENS machine. Varying frequencies (less than 10 Hz to more than 50 Hz) can be used with it.

TENS is a widely-used non-invasive therapeutic modality that utilizes electrical currents to alleviate pain and promote healing. The strategic placement of electrodes is crucial to the efficacy of TENS and can vary depending on the specific condition being treated. For general pain relief, the electrodes are typically placed directly over the painful area or along the path of the affected nerves. In cases of chronic wounds, studies have shown that applying electrical stimulation to the skin's surface can promote the healing process by affecting the movement of cells involved in wound repair. The electrodes are often positioned around the perimeter of the wound or along the border between healthy and damaged tissue.

Interferential current, a type of TENS, has been investigated for its potential to modulate sensory, motor, and pain thresh- olds. Specific electrode placement for this application involves positioning the electrodes over the target nerve, such as the median nerve, to elicit the desired physiological response. When applying TENS, it is important to consider potential complications associated with electrode use. Mechanical factors, such as excessive pressure, can lead to tissue damage, while chemical factors, like contact dermatitis, may result from the electrodes' interaction with the skin. Additionally, the flow of electrical currents can cause injury through mechanisms like Joule heating, electroporation, and excitatory neurotoxicity [6].

Another form of electrical stimulation therapy is Cranial Electrotherapy Stimulation (CES), which involves the application of low-intensity electrical currents directly to the head. CES has been explored for its potential to modulate brain activity and alleviate various neurological and psychological conditions, such as anxiety, depression, and insomnia. The electrodes are typically placed on the forehead or mastoid processes to target specific brain regions. Unlike TENS, which focuses on peripheral nerve stimulation, CES aims to influence central nervous system functioning through direct current application to the cranium. CES is believed to work by altering neurotransmitter levels and brain wave patterns, potentially leading to improved mood, sleep, and cognitive function. While the exact mechanisms are not fully understood, CES has shown promising results in clinical studies, making it a valuable complementary therapy for various mental health and neurological disorders [7].

Researchers have found that CES can effectively reduce symptoms of depression, anxiety, and insomnia by modulating the activity of neurotransmitters like serotonin, dopamine, and norepinephrine. Additionally, CES has been observed to increase alpha and theta brain wave activity, which are associated with relaxation, stress reduction, and improved cognitive performance [8].

Furthermore, CES has been investigated for its potential to enhance memory, attention, and cognitive flexibility. Some

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2024 3rd International Conference for Advancement in Technology (ICONAT)
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An Economic IoT-driven Rural Greenhouse Control System for Optimal Plant Growth

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***Abstract*— To grow plants, conventional greenhouses require a controlled environment. Maintaining precise climatic conditions within greenhouses without an automatic control system is virtually difficult. The proposed method automatically monitors the weather conditions. This system employs temperature, light intensity, and soil moisture sensors to keep track of the climate within the greenhouse. The system continuously monitors a temperature sensor, an LDR sensor for light intensity, and a moisture sensor for soil moisture. The system continuously sends this data to the microcontroller, which analyses it and continues sending it through a Wi-Fi connection to the online web server. To view the internet server system in life, this data is updated. The Internet of Things-based Greenhouse System, therefore, offers consumers an effective Internet-based smart greenhouse monitoring and control solution. This system is made in an economic manner to support the needy farmers even in rural areas.**

Keywords—soil moisture, WIFI module, temperature sensor, light sensor.

I. INTRODUCTION

In today's life, Significant greenhouse-related factors may now be automatically monitored and regulated (as shown in Fig. 1). The manual process is still quite prevalent in an important industry like agriculture, which means that when it comes to small-scale farming, the automatic monitoring and management of a greenhouse system has not fully taken hold [1]. There are several reasons why a greenhouse system has not been fully automated, including a lack of technical expertise, expensive costs, and a high maintenance demand [2]. From the dawn of humankind, farming has been one of the most significant human jobs, and tragically, physical labour is still required in most farming operations today. To grow plants in climate-controlled surroundings for the highest plant yield, a greenhouse monitoring and control system is an essential part of agriculture. It is also very significant because it protects plants from extreme weather by providing a controlled climatic environment, extends the growing season, and enables us to plant earlier and harvest later [3]. (As shown in Fig. 2). In the case of this job, an automatic greenhouse is present, requiring that the system be carefully managed and monitored in a predetermined climatic state that needs the best farm/plant output [4]. Serval techniques were used after humans began practising agriculture [5]. In the earlier days when no technology came into extension, the farmers were using some of the traditional ways to harvest the crops. Here are some of the benefits of a smart greenhouse [6].

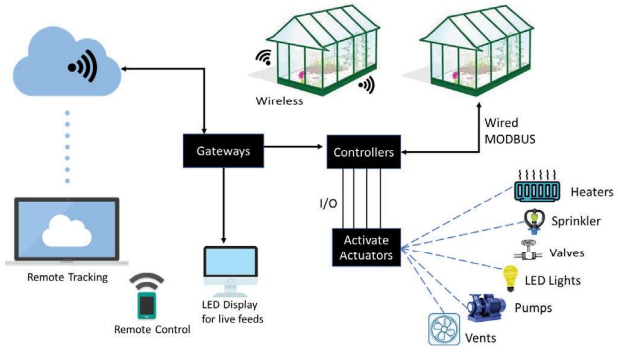

Fig. 1. IoT-empowered smart greenhouse

A smart greenhouse has a variety of benefits, including.

- Increased yields are a result of greenhouse automation and intelligent optimization, which offer the plant the ideal circumstances for growth [7]. Monitoring the plants and adjusting fertigation rates, lighting, water, temperature, and air are all made feasible by greenhouse automation systems.
- Prevent wilting of crops in greenhouses by protecting plants from excessive temperatures: Temperature control is essential for maintaining yield quality and avoiding wilting of crops in greenhouses [8].
- The automatic control of atmospheric conditions increases crop quality: Automated greenhouses control humidity changes, security breaches, heaters, fans, equipment, and power outages to provide a financially advantageous outcome for the farmer [9].
- Saves resources: If you have a lot of big greenhouses to handle, a smart greenhouse can help you save time and money. In addition, sophisticated computer

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Single Phase Grid Connected Nine Level Quadruple Boost Inverter with Current Control and Active Damping Capability

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***Abstract*— This study describes a 9-Level Switched-Capacitor Quadruple Boost Inverter (9LSCQBI) for the 1-Φ grid-tied system through L-C-L filter. This inverter can generate a quadruple voltage gain from a single dc source. Compared to prior switched-capacitor inverters, the absence of an H-bridge decreases voltage stress on switches. The recommended inverter can handle inductive loads and accomplish capacitor voltage balancing itself without the use of auxiliary circuits. The L-C-L filter is frequently employed in grid-tied inverters to decrease switching frequency harmonics. Yet, the filter's resonance produces stability concerns, necessitating effective damping. To avoid resonance, one approach is to connect a resistor to the filtering capacitor in series. However, this affects the inverter's efficiency. The proposed method employs current control and an Active Damping (AD) scheme entails incorporating a proportional regulation loop to monitor filter capacitor's current. In which, the grid current is controlled by a Proportional Resonant (PR) controller, whereas AD eliminates L-C-L resonance and preserves stability. Simulation outcomes demonstrate the proposed scheme's efficacy and robustness.**

Keywords— Multilevel Inverter - LCL filter - Current Control and Active Damping.

I. INTRODUCTION

Today, Multi Level Inverters (MLIs) have become popular in a variety of applications, including driving, AC gearbox, and Electric Vehicles (EVs) [1-3]. MLIs outperform standard two-level inverters because they require less filtering, reduce the switch's dv/dt, improve energy efficiency, and can lessen the radiation effect [4]. Classical MLI is divided into three groups: Neutral-Point-Clamped (NPC) [5,6], Flying - Capacitor (FC) [7,8], and Cascaded-H-bridge (CHB) [9,10]. To generate the appropriate voltage, NPC and FC inverters can utilise clamping diodes and flying capacitors. Yet, when the output level rises, the control procedure gets increasingly complicated due to the difficulties of maintaining voltage balance. The CHB inverter's H-bridge module is scalable, modular in design, and easy to control. In these topologies, a scarcity of electrical power and the need for the several DC sources may limit their use. According to the above mentioned issues, this article presents a low-power 9-Level Switched Capacitor Inverter (9LSCQBI). The primary characteristics of the 9LSCQBI are: (1) Producing a 9-level output voltage requires a only one DC source and two capacitors. (2) low voltage stress, and the voltage rises fourfold. (3) Each switch's PIV is set to 2 Vdc, (4) which can minimise the inverter's Total Standing Voltage (TSV). (4) The capacitor voltage is self-controlling and doesn't need any further adjustment.

Distributed Generation (DG) that employ renewable energy sources like solar and wind are gaining popularity due to their environmental benefits, which include reduced greenhouse gas emissions and pollution. DG connects to the utility power grid via a grid-tied Voltage Source Inverter (VSI). The inverter produces sinusoidal current to the grid, that needs to synchronized with the voltage [10,11].

Traditional PI controllers have limitations, such as the inefficient to monitor commanded current without causing steady-state inaccuracy. This necessitates transforming AC variables to dc quantities in a d-q frame using the Park's transformation, which raises the controller's burden and is challenging to implement in single phase systems [12-14]. The PI regulator gives high gain at the grid's frequency, making it a desirable option. This helps to avoid steady-state errors and reject current harmonics due to grid voltages. This can be employed in 1-Φ system without transformation and adjusts for harmonics [15–17].

The Pulse Width Modulation (PWM) of the MLI causes grid current harmonics. Hence a filter is required to decrease them. The L-C-L filter outperforms the L filter with regard to attenuation, quantity, and price [18-26]. Yet, the LCL filter provides significant advantages. The peak occurs at the resonant frequency. Voltage harmonics near the resonant frequency leads to grid current resonance. The works reported in the given literature involving current control and active damping for grid connected two-level inverters. In this paper, current control and active damping is tested with grid connected 9-level inverter.

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FCS-MPC Based Grid-Tied Self-Balanced Switched Capacitor Reduced Switch Nine Level Inverter

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***Abstract* — Switched-Capacitor Multi Level Inverter (SCMLI)s are becoming increasingly popular due to its application with low voltage input sources. This article suggests a new single dc source double boost MLI to overcome existing inverter limitations, such as their large number of elements. The suggested inverter uses Switched capacitor unit having self-balanced capabilities. This MLI charges capacitors stage by stage using a low voltage DC source, resulting in capacitor amplitudes that are several times the supply voltage. This asymmetrical capacitors produce a large magnitude of output voltage, reducing the need for many DC sources and semiconductors. This simplifies the structure. The suggested inverter employs single DC supply of low voltage, making it suitable for renewable energy applications. This converter may provide negative output voltage despite the high voltage H-bridge circuit, which reduces the quantity of devices. To validate the suggested MLI operation, a 9-level inverter model is emulated using Simulink environment of the MATLAB using Nearest Level Modulation (NLM). Also, the effectiveness of this topology is tested as a Grid Tied Inverter (GTI) with Finite Control Set Model Predictive Control (FCS-MPC) approach.**

Keywords—Grid Tied Inverter, Finite Control Set Model Predictive Control, Switched Capacitor Multi Level Inverter.

I. INTRODUCTION

The industry and scientific communities have focused a great deal of attention on Multi Level Inverters (MLIs) due to its inherent benefits, which include lower the system experiences time rate of change of voltage stresses, output voltage waveforms that are almost sinusoidal, and operates at a low frequency for switching. Traditional MLIs, viz. Cascade H-bridge (CHB), Flying Capacitor (FC), and Neutral-Point Clamped (NPC), were developed for grid tied applications, and motor drivers. Nevertheless, balancing the voltages of capacitors and having a large number of semiconductors provide difficulties for FC and NPC, which are made worse by adding levels [2–5]. Using multiple separate sources is another drawback of the CHB [6]. Neverterthless, these MLIs are unable to increase the DC supply voltage which is necessary for Electric Vehicles (EVs) as well as renewable sources, such as solar panels [7, 8]. Utilising a transformer or inductor is a straightforward method to increase the voltage magnitude. However, adding magnetic cores to a circuit increases its volume, cost, and electromagnetic interference.

Now a days, a substantial attention in the area of industrial electronics towards inductor less and transformer less Switched Capacitor MLI (SCMLI)s [1]. These MLIs are capable of producing output voltage with larger magnitude that results from converting the input DC voltage through the capacitors. These single-source converters have several benefits, including reduced harmonic content and light weight [1].

One of the drawbacks of these converters is the presence of a large quantity of semiconductor devices and capacitors, leading to a rise in the weight, size, and price of the inverter. [9-11] introduced a SC inverter that use a large input DC supply to produce many levels in output voltage through division in source voltage across the capacitors. Consequently, it lacks the ability to amplify the DC supply voltage to a greater magnitude. [12] introduced the SCMLI that can give both positive as well as negative voltage levels by utilizing four separate DC supplies, avoiding the need for a H-bridge network. The notable aspect in described MLI is that when more output voltage levels are produced, the no. of switching devices and DC supplies also becomes larger. [13] The authors introduce two categories of SCMLIs. There is a large quantity of switching devices and their corresponding driver circuits. The Marxiplier topologies, introduced by Marx in [14], are an improved structure of the conventional Marx topology. Unlike the architecture proposed by Marx, the Marxiplier is capable of amplifying the capacities, so increasing the lower value of source voltage to higher value of inverter's voltage. In recent years, there have been proposals for new SCMLIs in [15] and [16]. Nevertheless, the intricate configuration required to generate higher levels in output voltage is a disadvantage of traditional designs.

This paper presents a high gain unique DC source SCMLI configuration. The recommended MLI used a lower

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An Economic Loss Reduction Using Static VAR Compensator and Capacitor Placement in Reconfigurable and Expandable Distribution Grids With a Variable Electric Power Demand

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***Abstract*—Using a combination of hybrid system reconfiguration and expansion together with placement of static VAR compensators (SVCs) and shunt capacitors that are dependent on time varying electricity consumption to economically minimize network losses, is an optimization challenge that requires substantial numerical tries in real distribution networks. In a bid to reduce complexities, many of previously published studies rarely considered the variability of load despite the fact that ignorance of load variation has the capacity to reduce the precision of solutions. Due to this reason, this paper proposes an efficient economic module to create variable loads in a large-scale hybrid problem of network reconfiguration and expansion, as well as placement of reactive power controllers. The implementation of the model proposed in this paper was conducted on two real distribution systems with actual load variations. The proposed model exhibited faster computational processing, precision, easy application of the model, and cost effectiveness compared to the conventional based-peak load approaches as well as variable load-based frameworks in the presence of fixed capacitors and variable VAR compensators.**

***Index Terms*—Economic loss reduction, load changes, network expansion, reactive power installation, reconfiguration, SVC.**

NOMENCLATURE

A. Symbols

Ω^B	Set of all existing branches and corridors.
Ω^C, Ω^{EB}	Set of potential corridors for line expansion and existing branches.
Ω^L, Ω^P	Set of load buses and supply nodes.
Ω^N, Ω^R	Set of all nodes and reactive power compensators buses.
$\|\Omega^N\|$, $\|\Omega^P\|$	All and supply nodes number.

B. Parameters

a, C_c	Economic inflation rate and construction cost of a new distribution line.
C_e, C_s	Energy and switches cost.
C_f, C_{svc}	Capacitor and SVC instillation costs.
I_{ij}^{up}	Upper value of squared current magnitude in branch ij.
L_{ij}	Length of line ij.
Lf_{cap}, Lf_{SVC}	Capacitors and SVC lifetimes.
Lf_{line}, Lf_s	Lines and switches life durations.
NC_i, $Nsvc_i$	Maximum number of installable capacitors and SVCs on node i.
$Pl_i(t_n)$, $Pl_i(t_{max})$	Power of active demand of bus i at times t_n and t_{max}.
$Ql_i(t_n)$, $Ql_i(t_{max})$	Power of reactive demand of bus i at times t_n and t_{max}.
QC, Q_{SVC}	Size of one capacitor and SVC.
R_{ij}/X_{ij}	Branch resistance/reactance in line ij.
t_{max}	Maximum load moment.
V_{low}, V_{up}	Square of lower and upper voltage limits.
θ_{lag}, θ_{lead}	Lagging or leading phase angles of supply nodes.

C. Variables

$b_{ij}(t_n)$, $b_{ij}(t_{max})$	Variables for representing KVL in the network loops containing line ij at times t_n and t_{max}.
$I_{ij}(t_n)$, $I_{ij}(t_{max})$	Magnitude of squared current in line ij at times t_n and t_{max}.
nb_{ij}	Branch ij status (1 for connected lines and 0 for others).
nc_i, $nsvc_i$	Number of potential capacitors and SVCs connected to bus i.
$Pb_{ij}(t_{max})$	Active power absolute amount of branch ij at moment t_{max}.
$Qb_{ij}(t_{max})$	Reactive power absolute amount of branch ij at moment t_{max}.
$Pp_i(t_n)$, $Qp_i(t_n)$	Active and reactive supply of bus i at moment t_n.
$Qsvc_i(t_{max})$	SVC reactive injection on node i at moment t_{max}.
$Qsvc_i(t_n)$	Reactive power adjustment of node i by SVC at moment t_n.
$V_i(t_n)$, $V_i(t_{max})$	Magnitude of squared voltage of bus i at times t_n and $t_{\max}$.
z_{ij}	Power flow direction variable of branch ij.

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Optimized Power Quality Enhancement in PV-Integrated UPQC Systems Using Chaotic PSO-Based MPPT Algorithm

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***Abstract*—Power Quality (PQ) issues have garnered significant attention due to growing consumer awareness. They remain prominent among the rapid advancements in distributed generation, and the use of sensitive power electronic equipment integrated with Renewable Energy Resources (RES). Various control strategies, including Flexible AC Transmission Systems (FACTs) devices, are employed to effectively manage PQ challenges. Among these, Unified Power Quality Controllers (UPQC) stand out for their superior performance in mitigating PQ issues compared to traditional methods. This study focuses on Photovoltaic (PV) integrated UPQC for the mitigation of PQ issues and also boosts the voltage from PV by using interleaved Single Ended Primary Inductor Converter (SEPIC) converter. Moreover, Chaotic Particle Swarm Optimization (CPSO) based Maximum Power Point Tracking (MPPT) have been used to enhance performance of interleaved SEPIC converter. The UPQC provides a reduced harmonics with increased power factor. A Proportional Integral (PI) controller based on DQ theory is used to regulate the operation of UPQC. The proposed design of PV Integrated UPQC is evaluated and the simulation results are obtained in Matlab platform with reduced Total Harmonic Distortion (THD) of 3.37% with better efficiency.**

Keywords: UPQC, FACTs, PQ, CPSO based MPPT, interleaved SEPIC converter, DQ theory

I. INTRODUCTION

Renewable Energy Resources (RESs) such as solar, wind, and tidal power, are increasingly replacing conventional energy resources. The rapid growth in RES utilization is due to their accessibility, and abundance. RESs are inexhaustible and environmentally friendly, making them superior to traditional energy sources. However, RESs are intermittent because their availability depends on unpredictable factors [1]. Furthermore, the weather and geographic conditions have a significant impact on solar and wind energy, which causes PQ problems in the electrical system. Different distribution system optimization methods and control tactics are used to address these issues [2].

Various techniques have been proposed to mitigate PQ problems. One such technique is Static Var Compensator (SVC) and Static Synchronous Compensator (STATCOM) are additional devices utilized for addressing PQ issues, enhancing reliability by decreasing reliance on the main grid for PV applications. However, these solutions encounter challenges including complexity, time-consuming deployment, and issues related to harmonics [3-4]. Another technique is the Dynamic Voltage Restorer (DVR), which minimizes disturbances by utilizing Predictive Space Vector Transformation (PSVT) to assure stable and high-quality voltage for sensitive equipment. However, the DVR system is complex and entails higher implementation costs [5-6]. Distribution Static Synchronous Compensator (DSTATCOM) is a technique used to mitigate PQ issues, offering the unique advantage of potentially reducing overall system costs through the integration of renewable generation and PQ improvement functions. However, the system requires complex algorithms, and its performance is contingent upon solar irradiance and weather conditions [7-8]. Due to these challenges, this work proposes integrating UPQC, which efficiently detects PQ issues and reduces THD. The current and voltage of PV system is affected by issues such as temperature, irradiance, and the configuration of parallel and series modules. A fundamental challenge in utilizing RES for electricity generation is typically low voltage output. To increase this voltage level, the output from RES is directed to a DC to DC converter. Interleaved Boost converter proposed to boost up the voltage from solar panels. However, it also faces some challenging factors such as increased weight and size [9]. Interleaved Buck-Boost converters is another converter which offers enhanced efficiency and reduced ripple current and voltage. However, it also generate Electromagnetic Interference (EMI), which enhances the overall cost and complexity of design [10]. Due to these issues, the interleaved SEPIC converter has been introduced in this study. It provides reduced input and output ripples, increased capability,

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Management and Control of a Fuel Cell, Solar Photovoltaic, and Battery Energy Storage System Linked to a DC Nano Grid

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Abstract. The electric grid can be connected to non-conventional energy sources such as solar cells and fuel cells to effectively meet the distribution-side load requirements. The electricity grid has started incorporating more battery-powered energy storage systems (BESS), which increases the demand for energy management systems. In this study, we looked at various different PV operating modes, as well as an FC-based DC Nano Grid that was powered by BESS, and a recommendation towards an efficient energy management system are all explored. The primary benefit is that it maintains a consistent direct current (DC) voltage across the grid. The Simulink/MATLAB software is used extensively in these simulated case studies. **Keywords:** Power Management System, Nano grid, Fuel Cells, and Photovoltaic cell.

1 Introduction

Due to the benefits over conventional energy sources, power production technologies including fuelcells and photovoltaic have gained importance. The low voltage DC ouput from these sources are boosted using various dc-dc converters [1-3]. A couple of the drawbacks that prevented them from operating independently include cloudy weather, partial shadow for the photovoltaic cell, and a pricy and scarce supply of propellant for Fuel Cell. For continuous supply of electricity to the load, more than two sources and a storage of electrochemical energy product links are needed. This study includes a DC Nano grid comprising of batteries, fuel cells, and solar photovoltaics. Researchers interest in DC Nano Grids has recently surged due to the improved dependability and effectiveness of renewable resources [4]. At its peak, this PV has a higher power output. The primary power comes from tracking, with backup from a fuel cell and battery for times of high demand. Higher energy

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Internet of Things based Identification of fault in Back Channel Cable

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Abstract-The utilization of underground cables has become prevalent with the advancement of the power system grid. These cables are susceptible to various faults caused by underground conditions, deterioration, and rodent activity. Identifying the source of a fault poses a challenge, as it often necessitates excavating the entire line to inspect the cable. However, skilled repair personnel can accurately pinpoint the faulty section, allowing for targeted excavation to locate the fault source. This approach significantly conserves time and resources, facilitating quicker maintenance of underground cable systems. The objective of this project is to ascertain the distance of the underground cable fault from the base station in kilometres. The suggested method minimizes service disruptions, lowers operating expenses, and increases the accuracy of defect detection. By integrating IoT technology, it is possible to maintain a more responsive and resilient power infrastructure through continuous monitoring and real-time data processing. This study opens the door for more advancement in the field of power system management and shows how the Internet of Things has the ability to completely transform conventional fault detection techniques.

Keywords: Fault Detection, Arduino, Alternating Current (AC) & Direct Current (DC), GSM.

I.INTRODUCTION

Over the years, the use of underground cables has significantly been increased due to its many advantages over the Head cables, such as being less affected by adverse weather conditions and being more eco-friendly. However, locating faults in underground cables is a more difficult task as the cables are not visible. It aims to detect the exact location of the fault and the distance of the fault from the based station in kilometres in order to facilitate faster repairs, improve reliability, and reduce outage time! This concept leverages the utilization of Ohm's law and a tracer method to detect faults [1]-[3]. It is equipped with a set of resistors, power supply, switches, Arduino Uno, and LCD to optimize performance and reduce the size and cost of the product. Embedded systems are the foundation used in this project to improve fault detection processes for better system reliability. The project also addresses the increasing approach to locate faults in underground cables. When faults occur, the power flow is redirected towards the fault, impeding the supply to the neighborhood and destabilizing voltages. Timely detection of fault is crucial in electrical cables; hence, the microcontroller plays a fundamental role in quickly detecting four main types of faults and providing trip signals to the relay [4]-[5].

A. Functionality and description of the device

The creation of an underground cable fault distance locator device that may be used to locate line faults and disconnect related instruments or systems is our contribution to this work. In order to accomplish this, the Atmega328p microcontroller is used, and the intended circuit is used to display the fault type on the LCD screen. In order to prevent harm, a relay circuit is also attached to the system to separate the unhealthy circuit from the working one [7].

Analog to digital conversion is how the suggested system works. These signals are produced by the microcontroller, which then compares the ADC's digital input signal with a predetermined range of values. The microcontroller triggers the relay to trip the circuit if the input falls or rises outside of the predetermined value range. In addition, the type of fault that has occurred is displayed on the LCD panel via a parallel signal. This procedure improves the overall operation of the system by enabling the efficient tripping and presentation of the fault type [10].

II.RELATED WORKS

A. *Underground Cable Problem Finding Prior*

In this study, we proposed an Arduino-based fault localization model for subterranean cable lines. This research aims to calculate the distance in kilometers from the subterranean cable fault at the base station. For this project, we used a basic understanding of Ohm's law. The

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Design and Evaluation of Bidirectional Dual-Input DC-DC Converter for Integration with Electric Vehicles

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Abstract

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V. MPPT Technique

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Metrics

Abstract:
This paper focuses on in-depth analysis of a bi directional dual-input single output (BDISO) DC-DC converter specifically designed for electrical vehicle (EV) applications that integrates photovoltaic (PV) Technology with maximum power point tracking (MPPT) functionality. The converter dual functionality has been proven to optimize the energy efficiency of electric vehicles by helping manage power flow between multiple power sources. The speech focused on the operation of the switch, its use in electric vehicles, and its quality and inspection standards. Real world case studies demonstrate successful practices, while discussion of problems and innovative solutions provide general context. This research not only helps improve the performance of electric vehicles, but also demonstrates the important role of bidirectional transmission in shaping the future of electricity transportation. Using MATLAB/Simulink software

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I. Introduction

The growing demand for efficient transportation solutions is driving the rapid growth and adoption of electric vehicles (EVS) worldwide. As the automotive industry continues to transition to electric power, people are paying more and more attention to improving the performance, reliability and safety of the control system of electric vehicles[1]. An important aspect of this change is the integration of renewable energy sources such as photovoltaic (PV) technology to support the energy needs of electric vehicles and reduce their carbon footprint. In this context, bi-directional dual-input single-output (BDISO) DC-DC converters are important components in the vehicle's electrical power system that provide bi-directional energy flow from the vehicle's battery pack and external power sources. The versatility of BDISO converters makes them particularly suitable for integrating renewable energy inputs such as photovoltaic arrays into electric vehicle charging infrastructure[2]. Integrating photovoltaic technology into an electric

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Optimization of Cluster Head Selection Using Bacterial Foraging Algorithm for Energy-Efficient Routing in Wireless Body Area Networks

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Abstract:

Optimizing cluster head (CH) selection in Wireless Body Area Networks (WBANs) using the Bacterial Foraging Optimization (BFO) algorithm. The approach aims to enhance network performance by minimizing energy consumption, balancing node load, and ensuring reliable communication. The process begins with the initialization of bacteria, representing potential CH candidates, which are randomly distributed within the network. A multi-objective fitness function evaluates each bacterium based on residual energy, proximity to the sink, and data load distribution. The BFO algorithm employs chemotaxis for exploring the solution space, guided by both directed and random movements. The reproduction phase ensures that the most efficient bacteria propagate their traits to subsequent generations, while the elimination-dispersal phase prevents stagnation by introducing diversity in the solution space. The iterative process continues until a stopping criterion, such as convergence or maximum iterations, is met. The optimal CHs are selected based on the fitness evaluation, ensuring energy efficiency and balanced operation within the WBAN.

Keywords: Iterations, Communication, Cluster head, Energy, WBAN, BFO, Bacteria

1.Introduction

In modern healthcare systems, Wireless Body Area Networks (WBANs) are pivotal in facilitating real-time health monitoring. WBANs rely on small, energy-constrained sensor nodes deployed on or inside the human body to collect vital health data. To prolong network lifetime

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Evaluation of E-vehicle Efficiency Enhancement with Magnetic Materials

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Abstract. Electric vehicles (EVs) commonly use BLDC (Brushless DC) motors because of their efficiency, reliability, and low maintenance needs. BLDC motors are perfect for vehicle propulsion because they convert a large portion of electrical energy into mechanical energy, consuming less energy while producing a significant amount of torque. They can be lighter and more compact because of their better power density. Given how important weight and space are in EVs, this is a huge benefit. In applications where smooth operation is crucial, such as electric vehicles (EVs), Detent torque is an undesirable characteristic in BLDC motors. It describes the jerky or uneven spinning brought on by the torque ripple that results from the magnetic interaction among the stator and rotor magnets. The effect of different magnetic materials on detent torque in Brushless DC motors used in Electric Vehicles are analysed in this research.

1 Overview

The transition to EV's is now pivotal in the global pursuit of sustainable transportation. Among various electric motor options, the Brushless DC (BLDC) motor stands emerged as a well-liked option for EVs due to its low maintenance requirements, reliability and efficiency. Unlike traditional motors that rely on brushes for commutation, BLDC motors use electronic control systems to manage power distribution. This not only reduces wear but also enhances performance, making BLDC motors ideal for modern electric vehicles where smooth operation, long life, and energy efficiency are essential. With the rapid advancements in battery technology and motor control systems, BLDC motors in EVs enable smoother rides, reduced energy consumption, and higher torque at lower speeds. This introduction delves into how BLDC motors work, their advantages over other motor types, and their critical role in the future of electric transportation. Internal Permanent magnet Brushless DC motor is the One of the most well-known BLDC motor types in this category.

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Prevention of Road Accidents by Using Li-Fi Technology

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***Abstract*— The best way to lower car accidents is vehicle-to-vehicle communication. According to this study, light-emitting diode bulbs are the main tool used to implement Li-Fi technology. Data is transmitted via light's spectrum to act as an optical wireless channel for signal propagation. By using this technology, many lives can be saved and traffic accidents can be prevented. To facilitate communication between cars traveling within a touching distance of one another, an ultrasonic distance-detecting sensor is utilized. This Li-Fi is used to transfer data between cars. Text, video, and other types of data can all be sent over Li-Fi. This concept can be carried out as economically and efficiently as possible. LED-based lighting is widely utilized in daily activities today. Because of its benefits, including quick switching, high power efficiency, and safety for human vision, it may also be used for communication. Therefore, this project will address visible light data transmission between automobiles that is ecologically benign. The visible light is composed of white LEDs that transmit audio signals to the receiver. VLC has a promising future and enhances existing RF communication by becoming more efficient.**

Keywords—*Li-Fi (light fidelity), Arduino board, ultrasonic sensor, potentiometer, IR (Infrared)sensor, Led, buzzer.*

I. Introduction

The concept presents a cutting-edge system that revolutionizes real-time vehicle distance monitoring and lane change alerts by utilizing Li-Fi (Light Fidelity) technology. Using Arduino-based units integrated with ultrasonic and IR sensors, potentiometers, and Li-Fi transmitters/receivers, this system allows seamless data exchange [1]. It focuses on addressing safety concerns by enabling vehicles to communicate essential information such as distance measurements, speed variations, and lane change alerts. Through the efficient transmission of data via Li-Fi technology, the project aims to offer drivers immediate warnings and alerts, particularly in scenarios where close vehicle proximity poses potential risks. By tackling issues related to tailgating and abrupt lane changes, the system strives to contribute to a safer and more streamlined driving environment, promoting road safety and mitigating potential accidents [2].

The ultrasonic sensor measures the distance between the vehicles, the potentiometer represents the vehicle's speed, and the IR sensor detects lane-changing actions. The Li-Fi transmitter and receiver on each Arduino enable data exchange between vehicles [3]. The ultrasonic sensor is used by the first Arduino unit, which is mounted in the car behind, to continuously measure the distance to the front vehicle. If the distance decreases beyond a certain threshold, indicating a close approach, the measured distance is transmitted via Li-Fi to the second Arduino unit in the leading vehicle. And enables visual feedback [4].

The second Arduino unit, installed in the leading vehicle, receives the distance data from the following vehicle. Upon receiving this information, the system processes the data and triggers a warning signal if the following vehicle approaches too closely [5]. Additionally, the potentiometer's speed reading is transmitted through Li-Fi to the following vehicle, enabling it to monitor the speed of the leading vehicle. Moreover, both Arduino units are equipped with IR sensors to detect lane-changing vehicles. When a lane change is detected, the leading vehicle transmits this event via Li-Fi to the following vehicle. The following vehicle responds by adjusting its speed and maintaining a safe distance from the leading vehicle. E Krishnakumar, N Rathan proposed a system that detects accidents automatically and prevents the causes of deaths due to accidents by using various sensors. This system uses LIFI technology which gives access to transmit data wirelessly [6]. Saravanakumar R, Rathan N proposed a RFID-guided automated voice-activated smart shopping cart for the visually impaired system which uses different kinds of wireless sensors to help visually impaired people in the context of shopping using carts [7].

K.P. Dinakaran, Manimurugan.M, Mohamed Anas, Sakthivel, Vasanth Kumar, Vijay Raghavan presented a low-cost method that decreases collision of vehicles. This system uses LIFI technology along with the communication between the vehicles efficiently [8]. K. A. R. D Perera, T. R Amarasena, L. H Edirisinghe, Dr. Anuradha Jayakody, N.

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Battery Monitoring and Control System for EV using IOT Technology

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***Abstract*—Electric vehicles represent a significant advancement for the automobile industry, promoting a more sustainable future with their eco-friendly approach and reduced fuel dependence. The battery is the primary source of energy for an electric vehicle. A reliable and real-time monitoring system is crucial to ensure the safety, performance, and longevity of the EV battery packs. This paper proposes an Internet of Things (IoT) based Battery Monitoring and Control System to monitor the vital parameters of electric vehicle batteries in real-time. This system utilizes the Internet of Things (IoT) to monitor and control electric vehicle functions automatically. Embedded sensors gather data which is then communicated through the Ubi Cloud protocol for autonomous management. The results depict various battery parameters, such as voltage, temperature, and humidity.**

***Index Terms*—Electric Vehicle, Battery Monitor, Control and IOT technology.**

I. Introduction

EVs are revolutionizing transportation, offering a cleaner and greener path forward. Integrating lead-acid batteries into electric vehicles (EVs) marks a foundational chapter in the evolution of sustainable transportation.Battery monitoring plays a critical role in optimizing the performance and extending the life of lead-acid batteries by closely monitoring parameters such as voltage, current, and temperature. The landscape of EVs has witnessed a transformative journey, evolving hand in hand with advancements in Battery Monitoring Systems (BMS) technologies. In the early 2000s, wired communication protocols like Controller Area Network (CAN) laid the foundation for seamless interaction between BMS components, ensuring efficient monitoring within the vehicle. The mid-2000s ushered in an era of wireless convenience, with the integration of bluetooth for mobile device connectivity, enabling users to monitor battery status on the go. Subsequent years saw the rise of Wi-Fi, offering high-speed data transfer and paving the way for real-time monitoring and updates. With the advent of the 2010s, cellular networks (3G, 4G) became integral, facilitating remote monitoring, tracking, and over-the-air updates. As we step into the 2020s, the promise of 5G connectivity and the integration of BMS into the Internet of Things (IoT) herald a new era of advanced electric vehicle communication.

Research on monitoring EV batteries has been extensive. Despite significant research on monitoring electric vehicle batteries, an unaddressed challenge exists regarding comprehensive control strategies. Existing studies primarily focus on monitoring techniques with limited control actions. Battery Management System of an EV with charge monitor and fire detection is discussed in [1]. The BMS monitors parameters, determines state of charge, and bms with charge monitor and fire prevention guarantees the security and longevity of the battery pack in electric vehicles. IOT based battery monitoring system for E.V discussed in [2], [3], [7], [9]. Though monitoring EV batteries with IoT is helpful, relying solely on a BMS for safety isn't infallible.

While a BMS detects battery degradation, it adds cost, complexity, and potential security risks. It might also impact performance and miss some safety concerns. So, while a BMS is valuable, a well-rounded approach that considers these limitations and combines it with other safety measures is key for optimal battery health and risk reduction. A study reviewed the safety aspects, battery technologies, and regulations surrounding BMS discussed in [4] identify the gaps in existing regulations, particularly for electric vehicles and stationary

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An Enhanced Repetitive Control Framework for Adaptive Neuro-Fuzzy Learning Grid-Connected Inverter with Current Control and Frequency Adaptability

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Increased Technical Efficiency of Various Renewable Energy Resources in Smart Grids and Power System

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Abstract

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I. Introduction

II. Literature Review

III. Methodology

IV. Empirical Results

V. The Benefits of Using Smart Grid Technology for the Integration of Renewable Energy

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Keywords

Metrics

Abstract:
The smart grid (SG) idea was created to give the power lattice the elements and abilities it requirements to effectively integrate environmentally renewable energy sources (RES) and achieve versatility. Since energy sources like sun oriented and wind power are innately unstable and unusual, controlling in shrewd organizations can be troublesome. This study proposes an original answer for this issue by combining the upsides of particle swarm optimisation (PSO) and extreme learning machine (ELM) approaches. The proposed approach models and conjectures sustainable power age utilizing ELM, taking into account more exact preparation and determining. PSO guarantees maximized execution and effectiveness by improving the ELM calculation's boundaries in the meantime. Using a dataset of sun based energy yield, this study surveyed the proposed procedure and stood out its outcomes from those of other improvement techniques. The findings demonstrate that our ELM-PSO method lowers energy costs in smart grids and greatly increases the accuracy of predictions for renewable energy. Because the proposed approach can be employed to a range of RS sources, including hydroelectric power plants, wind turbines and solar panels, this investigation has wide-ranging implications. It can build a more robust and sustainable energy future by increasing the effectiveness and dependability of using renewable energy.

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I. Introduction

The issue with RES is that they are no longer a reliable supply of electricity for energy power systems (EPSs), especially wind and photovoltaic power plants. To align their capabilities with the technological necessities of the EPS, RES power generation must be

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Adaptive System for Human Scenario Forecasting in Intelligent Homes

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Abstract:
Due to the rise in energy usage in recent years, there has been a worldwide push to reduce energy use, particularly in the housing sector. When the concept of a "smart house" first emerged, it brought together automation and control via communication network technologies, as well as warmth from many heat source mechanisms and the terminology "process controllers" stated earlier. The Internet of Things, or IoT, is a multibillion dollar industry that shows how overlapping technologies span industries. It does this by utilizing the internet as an objective standard for sharing information that IoT services manage, supervise, or locate.Utilizing home automation systems, big data, and machine learning, together with the Internet of Things, to increase energy efficiency is another exciting topic. This article introduces HEMS-IoT, a comprehensive energy management system designed for the modern home. It leverages big data and machine learning to provide security and convenience in a comprehensive, eco-efficient setting. Weka API and the J48 neural network technology were used to extract user behavior and energy consumption trends. This approach was used to categorize loads depending on households.Apache Mahout with Rule-based language (RuleML) in a smart house for user comfort and security This is because these technologies are able to predict what consumers would require for energy action and supply it during this consultation because to the aggregation of user preferences. XtraPrinting As they demonstrated how they would monitor the instance, the article offers an experimental way for monitoring intelligent buildings for comfort and safety with the least amount of energy use. Therefore, their approach, which explains the demonstration success rate, is responsible for the test's high performance.

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Implementation of Perturb & Observe, FLC and ANFIS MPPT Strategy with Buck and Boost Converters in Photovoltaic Systems

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***Abstract*—This paper proposes an efficient method to carry out the maximum power point tracking (MPPT) technique that can improve the accuracy of extracting maximum power from PV system. Transient, steady-state modelled output for MPPT determines the maximum power output of the PV-array. In MPPT for extraction of maximum solar energy with least possible fluctuation in PV power output we have used Perturb and Observe with Fuzzy Controller and ANFIS algorithm. While the Boost converter adjusts it's duty cycle to elevate the PV voltage level. MATLAB-coded MPPT algorithms are simulated, modelling the PV array, Boost converter, P&O, FLC, ANFIS using Sim Power System blocks.**

Keywords - perturb & Observe(P&O); Fuzzy logic Controller (FLC); Adaptive Neuro-Fuzzy Inference System (ANFIS) and MATLAB.

I.INTRODUCTION

There are numerous methods for generating renewable energy, with solar photovoltaic (PV) arrays being one of the most commonly utilized. The energy harnessed from these arrays can be stored in batteries for future use. However, solar PV systems have notable limitations, particularly in terms of efficiency and reliability [1]. Two key factors that significantly impact these aspects are temperature and solar irradiation. The electrical output of a PV module largely depends on the amount of sunlight it receives, referred to as irradiance, as well as the ambient temperature surrounding the module.

In [2]-[4] Addressing the limitations associated with solar PV arrays, the incorporation of MPPT stands out as a highly effective solution. MPPT significantly contributes to tracing the maximum power from PV cells, enabling them to extract the highest available output power regardless of variations in irradiance and temperature. Consequently, in the context of efficiency, MPPT assumes a crucial role in real environmental conditions. Various techniques are accessible for the implementation of MPPT.

In [5],[6] MPPT techniques utilized for extracting the Pmax from an PV array are outlined below:

- Perturb & Observe algorithm.
- Fuzzy -logic method
- Adaptive- Neuro-Fuzzy System

II.Schematic Diagram of Photo Voltaic System

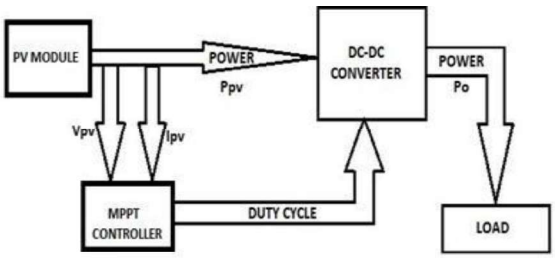

Fig. 1. Schematic Diagram of Photo Voltaic System

The central component of the entire system is the MPPT controller, responsible for optimizing power extraction from the PV array. The MPPT controller block involves the implementation of the MPPT algorithm, contributing to enhanced efficiency[7]-[8]. The PV system comprises the PV array, MPPT controller, and a DC-DC converter. Solar current and voltage from the PV array serve as inputs to the MPPT controller, with the resulting solar power directed to the converter unit [9]-[10].

In [11]-[13] the MPPT controller block executes the MPPT algorithm, producing a duty ratio as its output that is then sent to the converter block. Maintaining voltage and current at the ideal level to maximize power output is the purpose of this converter block. Facilitating the maintenance of voltage and current at the extracted maximum power point, the duty cycle serves as an output signal to the converter. Depending on the MPPT tracking, the duty cycle changes. Furthermore, the input voltage can be raised by using a Boost converter inside the converter block. Thus, incorporating the Perturb & Observe algorithm improves the accuracy and effectiveness of pulling out the most power possible.

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Comparative Analysis of SVM, Random Forest and Reinforcement Learning for Harmonic Mitigation in Smart Homes

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Abstract— **The increasing use of non-linear loads in smart homes has led to significant power quality issues due to harmonic distortions. Traditional filtering techniques struggle with dynamic load variations, necessitating intelligent machine learning-based approaches. This study compares Support Vector Machine (SVM), Random Forest (RF), and Reinforcement Learning (RL) for diagnosing and mitigating harmonics in smart home electrical networks. SVM, a widely used classification technique, is evaluated for its efficiency in predicting harmonic distortions based on historical FFT-extracted features. Random Forest, an ensemble-based learning method, is assessed for its ability to rank and classify harmonics with improved interpretability. Reinforcement Learning, in contrast, is explored for its adaptive filtering capabilities, enabling real-time optimization of harmonic mitigation strategies. A MATLAB Simulink model is used to simulate real-time harmonic data, and each method is tested on its ability to reduce Total Harmonic Distortion (THD). The results indicate that RF provides better generalization than SVM, while RL dynamically optimizes filter parameters, leading to the most effective harmonic reduction. The study highlights the trade-offs between accuracy, computational complexity, and real-time adaptability, demonstrating that RL-based adaptive filtering achieves the lowest THD, making it a promising approach for future smart home power quality management**.

Keywords— ***non-linear loads, Support Vector Machine (SVM), Random Forest (RF), Reinforcement Learning (RL), Total Harmonic Distortion (THD).***

I. INTRODUCTION

The increasing integration of non-linear electrical loads in modern smart homes has led to significant power quality issues, primarily due to harmonic distortions. Devices such as LED lighting systems, variable frequency drives, and home appliances with power electronic circuits introduce harmonics into the electrical network, leading to excessive Total Harmonic Distortion (THD). High THD levels result in increased power losses, overheating of electrical components, and a decline in the efficiency and lifespan of household appliances. To address these concerns, advanced computational methods are required for effective harmonic diagnosis and mitigation. Traditional harmonic filtering techniques, such as passive and active filters, provide partial solutions but lack adaptability in dynamic load environments. To enhance power quality, machine learning (ML) techniques have emerged as a promising solution, offering real-time adaptability and predictive capabilities. Among the various ML approaches, Support Vector Machines (SVM), Random Forest (RF), and Reinforcement Learning (RL) are widely explored for power quality management. Support Vector Machines (SVM) are widely used for classification tasks in power systems due to their ability to handle non-linearly separable data. By analysing historical harmonic patterns, an SVM model can classify harmonic distortions and predict THD levels with high accuracy. However, SVM is computationally intensive and requires careful tuning of hyperparameters to achieve optimal performance. On the other hand, Random Forest (RF), an ensemble learning method, leverages multiple decision trees to enhance classification accuracy and generalization. RF provides better feature importance ranking, making it useful for identifying dominant harmonics in complex electrical networks. However, RF can sometimes suffer from overfitting when dealing with noisy or high-dimensional data. Unlike SVM and RF, which rely on static classification models, Reinforcement Learning (RL) introduces a self-learning framework capable of dynamically adjusting harmonic mitigation strategies in real-time. RL-based adaptive filtering can optimize harmonic compensation by continuously learning from past and present power quality conditions. By integrating RL with active filtering systems, smart homes can achieve proactive power quality enhancement, reducing THD levels more efficiently than conventional filtering techniques. This study conducts a comparative analysis of SVM, RF, and RL for diagnosing and mitigating harmonics in smart homes. A MATLAB code is used to simulate real-time harmonic data, and each method is evaluated based on accuracy, computational efficiency, and adaptability to dynamic loads. The results demonstrate the trade-offs between these ML approaches and highlight RL-based adaptive filtering as the most effective technique for real-time harmonic mitigation. By exploring these machine

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DESIGN AND IMPLEMENTATION OF A FUZZY LOGIC BASED AC LINE FEEDER FOR UAV POWER SYSTEMS

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Abstract -This paper describes a design and implementation for a Fuzzy Logic-Based AC Line Feeder for UAV power system addressing the other challenges such as dynamic load variation, voltage stability, and power quality. The proposed solution incorporates fuzzy logic control components to maintain proper voltage and current regulation that results in efficient power transfer operations under unstable conditions. MATLAB/Simulink simulations demonstrate sufficient favourable results that prove the proposed system provides better voltage regulation and minimal harmonics than alternative methods. The functioning prototype demonstrates that the proposed design can be implemented in practice. The system enhances UAV power system reliability along with operational adaptability and efficiency while making it operational in tough conditions.

Keywords - Fuzzy-Logic-Controller (FLC), Voltage Regulation , Harmonic Reduction, MATLAB/Simulink, Efficiency, Reliability.

I. INTRODUCTION

Today's professional sector widely depends upon Unmanned Aerial Vehicles (UAVs) officially called drones to solve many different types of operational difficulties. UAVs serve multiple vital roles across environmental research operations, healthcare delivery, security applications, industry usage, commercial frameworks, rescue missions and recreational purposes. UAVs perform various functions which include inspection alongside surveillance and monitoring activities as well as image capturing processes and cargo transportation [1]. UAV operations under automatic flight or remote guidance have opened new opportunities to interact with environments and carry out various essential tasks starting from data acquisition through critical missions such as search and rescue and delivery and surveillance activities [2].

UAVs are gaining popularity across multiple domains because of their adaptable nature and technology continues to advance their usefulness. Numerous autonomous UAV operation control techniques exist today for practical implementation. The stabilization of UAV six degrees of freedom movements through translational and rotational motions is achieved through implementations of nonlinear PID controllers according to [3]. The implemented control techniques enable UAV operators to achieve accurate control of drone motion which leads to successful task completion. Two alternative approaches for control design of quadrotors involve Lyapunov theory-based backstepping adaptive control described in [4, 5] and reference model-based integral sliding mode control for velocity regulation. These developments indicate the appropriateness of the control scheme selected for fulfilling the needs of varying UAV applications [6].

In [7] Fuzzy logic has been applied mainly in intelligent control systems to effectively manage partial truths, uncertainties, and imprecisions. Due to this nature, it was applied in many control schemes in various applications, including those involving motors, robotic arms , suspension systems , and many more. In [8, 9] Fuzzy logic controllers can be used to make decisions with non-binary inputs, especially useful in the context of complex systems where high-precision data is not readily available. Fuzzy logic has been applied in various UAV applications, such as improving stability, enhancing responses to external disturbances, and adapting the system to changes. In [10, 11], an external disturbance can be mitigated by using a fuzzy PID controller. position data and its change are used as the basis of adjusting the PI controller parameters for a fuzzy PI controller. Applications such as the above show the potential of how fuzzy logic might improve the UAVs to act efficiently under changing and unpredictable circumstances. Fuzzy logic has also been implemented for UAV landing operations, which are inherently complex due to the need for precise control and the potential for disturbances.

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A FRACTIONAL CONTROLLER FOR LOAD FREQUENCY CONTROL TUNED BY METAHEURISTIC ALGORITHM

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Abstract:- This paper implements an optimization technique inspired by the survival strategies of participants in competitive environments Modified Hunger Games Search (MHGS) algorithm, for tuning the parameters of a fractional-order proportional-integral-derivative (FOPID) controller used for controlling frequency in an interconnected power system. In an interconnected power systems, maintaining frequency stability and managing tie-line power within acceptable limits is critical. To achieve this, the optimization algorithm efficiently calculates optimal controller parameters, improving the dynamics of load frequency control. The method leverages the Integral Time Absolute Error (ITAE) as the objective function, ensuring optimal management of frequency and tie-line power variations. The proposed approach is evaluated on a two area interconnected power system consisting of Area-I consisting of photovoltaic (PV) plant and thermal power plant, and another combining wind turbine (WT) generation with traditional thermal units while considering generation rate limits and governor dead-band effects. The simulation results implemented on MATLAB presents an improved performance with all deviations and dynamics under control.

Key Words:-- Fractional-Order PID Controller (FOPID); Load Frequency Control (LFC); Tie-line power; Multi - interconnected system, Photovoltaic (PV) plant; Thermal plant; Wind Turbine (WT).

I. INTRODUCTION

Traditional power grids are less reliable and cannot keep pace with growing energy demands in the face of fast-depleting fossil fuels. The power sector is moving toward renewable energy and multi-area interconnected systems for stability and reliability. But, with the irregular output of renewable sources, along with frequency fluctuations and load variation, there arises the need for efficient LFC. LFC targets to balance generation and demand while maintaining system stability through minimization of frequency and tie-line power deviations. Several control methods, such as PID controllers and more advanced meta-heuristic techniques such as sliding mode control, FOPID, and hybrid optimizations have been proposed and analyzed. These methods also suffer from various challenges such as complexity, computational intensity, and high sensitivity to the system non-linearity. This paper presents an MHGS optimization algorithm with non-uniform mutation operator that was developed to promote the solutions' diversity to optimize FOPID controllers for LFC. It minimizes the error and power deviations. Simulation studies were carried out on two networks, one with PV and thermal-based generation, and the other with PV, WTG, and two thermal-based units. MHGS is robust against other optimization techniques.

II. RELEVANT WORK

In [1] demonstrated that integrating batteries and super capacitors improves environmental and economic efficiency by significantly reducing LCOE and greenhouse gas emissions. Additionally, incorporating flywheels and pumped hydro storage with advanced technologies further optimizes LCOE, making hybrid storage configurations a valuable solution for sustainable and cost-effective energy management in modern power grids.

In [2] shows an advanced control approach that profits from the inherent robustness of TSMC and the optimal parameter tuning ability of ABC to enhance stability and oscillation damping compared to classical PID controls. Its superior performance under varied conditions attests to its ability to control the frequency in islanded micro-grids efficiently and reliably. The integration of RESs and ES units in LFC systems represents the contemporary approach to improving grid stability.

The controllers optimized by MPA were proven in [3] to exhibit superior performance in handling frequency deviations and ensuring system stability as compared with other optimization techniques. Transient response improvements are realized through the inclusion of energy storage technologies such as SMES and BES. These observations reiterate the potential of integrating RESs and ES units into the LFC schemes as dynamic remedies for the present power grids. Emotional controllers mimic the human brain to offer self-tuning of micro-grids with dynamic adaptation.

In [4] the design that has been furnished herein, the ideal design of a robust compensator is delivered, which is conceivably considered for single-area and multi-area power systems. The compensation ensures that it can counterbalance both constant and time-varying

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ECE-1

Cardiovascular Disease Detection through Integrated Spectral Analysis and Deep Learning

Publisher: IEEE Cite This PDF

B. Rakesh Babu ; Fahimuddin Shaik ; Vinit Kumar Gunjan ; Shaik Karimullah ; K. Riyazuddin **All Authors**

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Abstract:
Cardiovascular diseases are a global health concern that require prompt diagnosis in order to effectively treat. This study suggests a comprehensive method for detecting heart conditions from electrocardiogram (ECG) readings. In this study, we present an innovative approach that seamlessly integrates spectral analysis and deep learning techniques, augmented by feature fusion, to elevate the accuracy and efficiency of cardiovascular disease detection. The deep learning module incorporates a U-Net architecture, renowned for its efficacy in semantic segmentation tasks, to enhance the spatial localization of relevant features within the spectral data. The presented methodology, with its innovative integration of U-Net and KNN techniques, opens avenues for advancements in medical diagnostics, offering a harmonious blend of signal processing and deep learning to enhance healthcare outcomes. Keywords: Electrocardiogram (ECG) signals, Fused net model, K-Nearest Neighbors (KNN) algorithm, U-Net architecture.

Published in: 2024 Intelligent Systems and Machine Learning Conference (ISML)

Date of Conference: 04-05 May 2024

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Date Added to IEEE *Xplore*: 23 May 2025

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ISBN Information:

Conference Location: Hyderabad, India

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Vision-Based AI Technologies for Efficient Pig Farming

Publisher: IEEE Cite This PDF

M. Guru Vimal Kumar ; K. Kalaivani ; Y. Sunanda ; M. Boobalan ; S. Ashok Kumar ; R Kannan **All Authors**

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V. AI-Based Vision for Pig Detection And Tracking

V. AI-Based Sound for Pig Disease and Estrus Diagnosis

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Abstract:
Pork is an essential component in the world of animal goods. However, there are significant disadvantages to the conventional techniques used to keep an eye on the health and welfare of pigs in farming, such as high labor costs, resource consumption, and time commitment. Using antiquated monitoring methods may be harmful to pig farmers and the animals themselves when the number of pigs grown for farming keeps growing. This may jeopardize the general health and welfare of the pigs in addition to having an effect on the financial results of agricultural operations. With the realization that more advanced methods are required, the use of computational intelligence (AI) has become a crucial component of intelligent pig farming. AI is used in precision pig farming to track biometric data, such pig movement and sound, in real time. By using sophisticated sensors such as RF identification devices and cameras, this data is converted into significant markers of the wellbeing and health of pigs. By using AI, health and welfare concerns may be identified early, allowing for quick intervention and treatment depending on the signs that are examined. Consequently, this raises the pig farming operations' total productivity and financial efficiency. This research offers a thorough review and evaluation of the use of artificial intelligence in pig tracking, analysis of behavior, sound recognition, and detection by critically examining over 150 papers centered on precision pig farming. The investigation comes to a close with a summary and discussion of the benefits and drawbacks of using precision farming methods in pig production.

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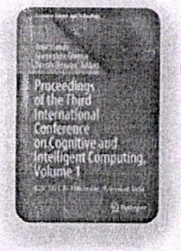

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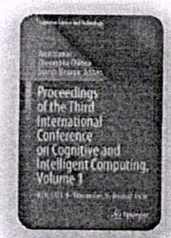

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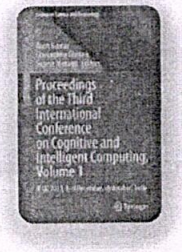

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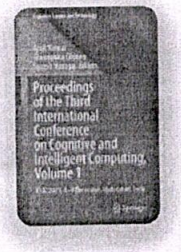

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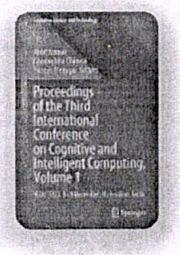

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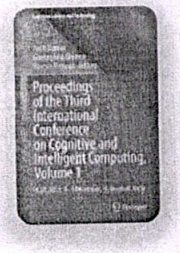

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Abstract

Precise Detection of Vitiligo Using Deep Learning Methodology

Publisher: IEEE Cite This PDF

Tejaswi MurarrySetty ; C. Deepa ; K. Babi ; B. Bhargavi ; E. Ajay Kumar **All Authors**

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Abstract:
Vitiligo is a skin disorder that causes depigmentation. Detecting it early is important for effective management. To detect vitiligo in dermatological photos, this research investigates two machine learning techniques: K-Nearest Neighbors (KNN) and Recurrent Neural Networks (RNN). The RNN architecture learns about vitiligo patches through sequence-based learning, while the KNN model uses feature similarity to classify skin lesions. The study uses measurements including accuracy, precision, recall, and F1score to assess how well both approaches perform. According to the findings, RNN is superior at identifying sequential dependencies in dermatological pictures, whereas KNN does a good job of classifying vitiligo patches based on local features.

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Revolutionizing 6G Networks: Large Intelligent Surfaces and Non-Orthogonal Multiple Access

Publisher: IEEE Cite This PDF

K Riyazuddin ; Apurupa Duggineni ; Asmabharin Shaik ; Chakradhar Maddam ; Dhananjay Kurukundu **All Authors**

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Abstract:
With the introduction of 6G networks, wireless communication is expected to undergo a paradigm change that will require creative solutions to meet the ever increasing needs for connection, data speeds, and energy efficiency. In the context of 6G networks, this study investigates the revolutionary effects of combining Large Intelligent Surfaces (LIS) and Non-Orthogonal Multiple Access (NOMA). Large Intelligent Surfaces are used to improve wireless communication through the optimization of signal propagation, mitigation of interference, and improvement of overall network performance. These surfaces are composed of reflecting elements and smart materials. Meanwhile, simultaneous connections and transmissions are made possible by non-orthogonal multiple access techniques, which greatly increase spectrum efficiency. In order to provide light on the individual and combined contributions of Large Intelligent Surfaces and Non-Orthogonal Multiple Access to the next generation of wireless networks, this article examines the synergistic impacts of their combination. By means of analytical models and simulations,We show that significant improvements in energy efficiency, coverage, and spectrum efficiency are possible. In an era of unparalleled connection demands, the suggested paradigm promises to transform the architecture and functionality of 6G networks and open up new avenues for ultra-reliable, low-latency communication.

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SOBOT: Design And Development of UV Sterilization Ostensible Doctor Robot for Clinical Purposes Based on IoT

Publisher: IEEE Cite This PDF

L Sivayamini ; C Venkatesh ; B Venkatesh ; K Sunil ; P Surendra ; N Sai Kumar Reddy **All Authors**

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Abstract:
Pathogen-borne diseases are a major source of human illness and mortality. The risk of contracting infectious diseases exists in every hospital around the world and is a universal fact. Patients who have had surgery are currently affected by hospital infections. As a result, daily pre-operative is one of the finest infection control measures used to reduce the count of bacteria, dust, and organic material in the environment and food items. Furthermore, doctors often must work in emergency departments and hospitals. But no physician can be available all the time in every place. There is a rise in the number of elderly people who should be able to care for themselves but require close monitoring in an emergency. As a result, smart robots powered by IoT are becoming more popular for resolving these difficulties. Based on the Internet of Things, this study developed a Virtual Robot for sterilization and health monitoring to address these problems. This highly developed real-time health tracking robot can detect common health issues like temperature, heart rate, and blood pressure. These detected health parameters are transferred to doctors through an internet module. Also, this robot sanitizes the hospital premises, electronic widgets, veggies, and fruits given to patients with ultraviolet radiation.

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Date Added to IEEE *Xplore*: 20 March 2025

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A Dynamic Deep Learning Model for Detection and Stage Categorization of Diabetic Retinopathy on Retinal Images

Publisher: IEEE Cite This PDF

L Sivayamini ; C Venkatesh ; Bhanuja Chalivendula ; Guru Hari Prasad Annadanam ; Anusha Kanaganipalli ; Chethan Siva Mogili All Authors

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Abstract:
Diabetic Retinopathy (DR) is a prominent problem over diabetics, as a result that follows functional a drop of eyesight among those people. There is becoming no treatment to restore vision if this aberration is not detected early. As a result, the only way out of these irreversible difficulties is to recognize and treat this sickness early. To keep patients' vision, ophthalmologists use human eye with another human naked eye, on the other hand, costs time and money and may occasionally result for error ncerns among ophthalmologists. Because of this deep learning technology is gnose diabetic retinopathy.Within this research, CLAHE is used to pre tasets of diabetic retinopathy for enhancement and noise reduction. After that, the vessels are retrieved from the pre-processed retinal pictures by applying vessel enhancement filters and morphological processes. The associated features are extracted after the vessels have been removed. Convolutional Neural Networks are used to classify retinal pictures based on the retrieved characteristics and feature selection. Following that, the phases of mild, moderate, and severe were identified based on the severity prediction. Finally, statistical characteristics like as sensitivity, specificity, PSNR, Accuracy, and MSE were calculated.

Department of ECE, Annamacharya Institute of Technology & Sciences, Rajampet, India

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An Artificial Intelligence Based Deeplearning Technique for Recognition of Multiple Brain Tumors on MRI Imager

Publisher: IEEE Cite This PDF

C. Venkatesh ; L. Sivayamini ; E. Thaniya ; A. Ushanjali ; K. Vishnu Vardhan ; S. Zaheer Basha **All Authors**

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V. Objective Analysis

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Abstract:
Brain tumors were devastating ailment found on all continents. Healthy brain tissue is ravaged by tumors, which can spread to other parts of the body. Thereby, rapid tumor cell proliferation could be fatal Manual diagnosis is not able to effectively track and categorize tumor kinds. Early brain tumor detection becomes more important since it may help determine the patient's condition and prevent harmful outcomes. Early brain tumor detection using Magnetic Resonance Images (MRI) may increase the lifespan of patients. The most widespread kinds of brain cancers were meningioma, glioblastoma, and astrocytoma. In this work, brain malignancies such as meningioma, glioblastoma, and astrocytoma are identified and categorized by employing Convolutional Neural Network (CNN) classifier in Deep Learning (DL). While DL techniques might not need any manual feature extraction while attaining appropriate classification outcomes, prior techniques that used machine learning (ML) required manual feature extraction. The Otsu multi-level thresholding method categorizes the medical images into segments for tumor identification after preprocessing the images for scaling and noise reduction. The Gray Level Co-Occurrence Matrix (GLCM) textural method of analysis is used to generate the features. For tumor type identification, a pre-trained CNN model is employed. It indicates no tumor if there is none. The tumor kind is classified otherwise. In the end, the accuracy of the demonstrated model was 98.31%. The other statistical metrics, such as SSI, PSNR, sensitivity, specificity, and MSE, were calculated and contrasted with the practices currently in application.

Published in: 2024 International Conference on Recent Innovation in Smart and Sustainable Technology (ICRISST)

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FinFET Based Design and Performance Analysis of Full Adders

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G.S.S.S.S.V. Krishna Mohan ; Mamidipaka Hema ; R. Gurunadha ; Aenikapati Swetha Priya ; Syamala Devi P ; G. Usandra Babu All Authors

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Abstract:
Due to the rapid development of today's technology, the semiconductor circuit design method has faced many difficulties and problems. The full adder (FA) is a very large (VLSI) versatile device widely used for addition and subtraction in a variety of designs in signal processing (DSP) and integration. VLSI technology allows designers to place many gates on a single integrated circuit (IC). In this article, a FinFET-based full adder is designed and simulated using Cadence Virtuoso tools. We also compare the design with existing technology. Comparisons include the number of transistors, power consumption, and latency. From the simulation results, we clearly see that the design reduces power consumption and latency by 44 % and 68.3 %, respectively, compared to existing FinFET -based designs.

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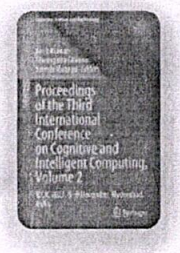

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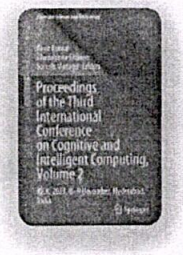
A Stochastic Geometry Approach to Performance Evaluation of Multiuser NOMA Wireless-Powered mMTC Networks

| Conference paper | First Online: 26 February 2025

pp 279–287 | Cite this conference paper



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Hyper Spectral Imagery System to Detect Endmember Sources

| Conference paper | First Online: 26 February 2025

| pp 299–305 | Cite this conference paper



Proceedings of the Third International Conference on Cognitive and Intelligent...

(ICCIC 2023)

B. Rakesh Babu, K. Riyazuddin, S. M. D. Fayaz Basha, Mudassir Khan & Shaik Ashraf Ali

Part of the book series: Cognitive Science and Technology ((CSAT))

Included in the following conference series:
International Conference on Information and Management Engineering

Abstract

A significant priority for hyperspectral unmixing is figuring out the ideal number of endmember sources, often known as "virtual dimensionality" (VD). Despite having a direct impact on HU results, VD prediction is frequently handled independently of the HU procedure. To mutually predict the VD throughout the object separation process, the saliency-based autonomous endmember detection technique is introduced in this paper. Pure images have larger availability abnormality (AA) values than "misdirections," thus we first demonstrate that this is a significant aspect of unnoticed subimages. In order to distinguish identified components from sound, SAED incorporates a hyperpixel earlier. This takes cues from the idea that elim frequently assemble in particular nearby regions within the picture as a result of adjacent pixels. The EE is presented as a strong area prediction task, the unknown fragmented are specifically defined as sensory elements in the AA sector, and the VD is simply figured out if there were no bright items in the AA image space. A recommended process uses the understanding and abilities of the subimages, which makes it more trustworthy than wavelength techniques. Mostly with real and false infrared imaging pictures, this was validated.

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Multiband OFDM Uplink and Mixed Receiving in the Millimeter Wave

| Conference paper | First Online: 26 February 2025

| pp 289–297 | Cite this conference paper



Proceedings of the Third International Conference on Cognitive and Intelligent...

(ICCIC 2023)

K. Riyazuddin, S. Bajid Vali, B. Abdul Raheem & S. M. D. Fayaz Basha

Part of the book series: Cognitive Science and Technology ((CSAT))

Included in the following conference series:
International Conference on Information and Management Engineering

Abstract

This article examines uplink communication using wide bandwidth millimeter-wave orthogonal frequency division multiplexing and hybrid receiving. Building the beamformer and couplers for hybrid MIMO requires an understanding of channel information. Systems with (multiple-input multiple-output) functioning at millimeter waves (mm-Wave). The system's spectral effectiveness is examined. When considering the channel model's impacts with wide frequency and spatial bands with beam squint outcome brought on broadband effects is evident in finding study of simulations. Furthermore, it is made evident how the beam squint is affected by the bandwidth and subcarrier count.

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Beam Phenomenon in Dual-Polarized Antennas Using MIMO

| Conference paper | First Online: 26 February 2025

| pp 637–645 | Cite this conference paper



Proceedings of the Third International Conference on Cognitive and Intelligent...

(ICCIC 2023)

K. Riyazuddin, B. Abdul Raheem, S. Bajid Vali, Pabbati Swathi, B. Rakesh Babu & S. M. D. Fayaz Basha

Part of the book series: Cognitive Science and Technology ((CSAT))

Included in the following conference series:
International Conference on Information and Management Engineering

Abstract

A significant step towards omnipresent communication systems and frictionless high-quality wireless connectivity will be made by the next wireless communications. Having dual-polarized antennas just at base station and consumers, an enormous MIMO system based on a single cell is considered in this research. We examine a dual-polarization channel model which takes into consideration a number of practical problems like cross-polar correlation (XPC), cross-polar discrimination (XPD) at the receiver and transmitter. We evaluate the potential spectral efficiency of either uplink or downlink (SE), as well as without consecutive interference cancellation, for such zero-forcing, linear minimal mean squared error, combining/precoding schemes (SIC) and maximum ratio (MR). Here, we analytically contrast the configurations of the uni-polarized and dual-polarized antennas. Evaluation is done on downlink and uplink spectral efficiencies. The equation demonstrates how using polarization region can boost the multiplexing gain. We note that a dual-polarized array having half as many antennas has the exact dimensions, beamforming gain by polarization as uni-polarized array. As a result, size can also be decreased while the SE is maintained or enhanced.

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Time-Correlated Fading Channels for Minimization of Energy Consumption in Wireless Networked Control Systems

| Conference paper | First Online: 26 February 2025

pp 617–625 | Cite this conference paper



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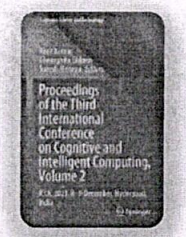
A Novel Contrast Enhancement Method for Color Images Using Type-II Fuzzy Set Algorithm

| Conference paper | First Online: 26 February 2025

| pp 269–277 | Cite this conference paper



Proceedings of the Third International Conference on Cognitive and Intelligent...

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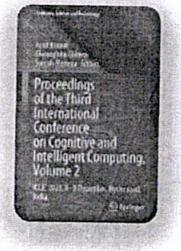
Enhanced Image Dehazing Using Contrast-Based Fusion Techniques

| Conference paper | First Online: 26 February 2025

| pp 647–654 | Cite this conference paper



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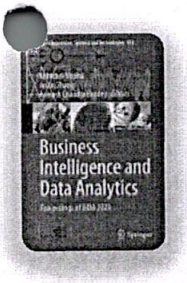
Brain Tumour Segmentation in Multimodal MRI via Pixel-Level and Feature-Level Image Fusions

| Conference paper | First Online: 25 February 2025

| pp 507–520 | Cite this conference paper



Business Intelligence and Data Analytics

(BIDA 2024)

M. Venkata Dasu, G. Lakshmi, A. Jeevitha, Y. Manasa, K. Hussain Peera & G. Jagan Mohan Reddy

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Abstract

IoT Intrusion Detection System for Vehicle and Emission Monitoring: Enhancing Cybersecurity in Connected Transportation

Publisher: IEEE Cite This PDF

N. Penchalaiah ; B Venkatesh ; Y. Suresh ; Lakshmi Sowjanya Koneru ; Mallikharjuna Rao Nuka ; J. Chinna Babu **All Authors**

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III. Methodology

IV. Results and Discussions

V. Conclusion

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Abstract:
The main purpose of creating an IoT Intrusion Detection System for vehicles is to detect the discharge from car engines. The main objectives of the IoT Intrusion Detection System are protection from cyber threats, improvement in transportation security, and accurate data discharge. The main parts of the IoT Intrusion Detection System are a Centralized Monitoring System, a special intrusion detection system, and vehicle emission monitoring devices these devices are used to detect vehicle emissions. This can be done by preprocessing the vehicle information by using machine learning that can be used to design the vehicles build a vehicle mechanism and identify the cyberattacks. The scientists have identified, at the end the employment of IoT Intrusion Detection Systems in both the automobile industry and pollution control fields. To maintain the vehicle information safe we use authentication mechanisms, network division, and secure communication protocols based on the secured data transmission channels. The present ongoing research presents a novel approach to overcoming the cybersecurity problems of vehicle emission tracking systems. The IoT Intrusion Detection System is used to boost network security and data integrity. This helps us to increase the confidence of the people regarding the exact discharge for emission control measures.

Published in: 2024 IEEE 6th International Conference on Cybernetics, Cognition and Machine Learning Applications (ICCCMLA)

Date of Conference: 19-20 October 2024

DOI: 10.1109/ICCCMLA63077.2024.10871291

Date Added to IEEE *Xplore*: 11 February 2025

Publisher: IEEE

ISBN Information:

Conference Location: Hamburg, Germany

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Early Enhancements within IoT Technology Integration for Ecological, Security, and Economic Auditing in Underground Mines

Publisher: IEEE Cite This PDF

J. Chinna Babu ; Lakshmi Sowjanya Koneru ; Adarsh Kumar ; B Venkatesh **All Authors**

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V. Result and Analysis
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Abstract:
Underground mining safety and environmental monitoring have all benefited greatly from the widespread application of Internet of Things (IoT) technology. The many sensors used in mining operations are categorized by usage, and this article covers the various connected and unconnected connectivity options accessible, along with the network structures that may be helpful in underground mines. It also describes the fundamental structure of the mine Internet of Things (IoT) system, which is based on a widely accepted three-layer IoT architecture. This article offers a thorough analysis of current advancements in IoT applications for monitoring the environmental factors in underground mines, such as When extracting, one must take into account the amount of humidity, heat, air conditioning, water in the soil, bottom assistance, and earthquake activity. Usage of the Internet of Things has additionally been developed for industrial safety management, personnel and equipment location, and fire and hazard detection. This article discusses the main obstacles to the widespread use of Internet of Things equipment in subterranean mines, including data management issues, limited battery life, increased investment requirements, and disruptions to operations. To enhance the feasibility and efficacy of connected devices in beneath-the-earth mines, more research into advanced advancements like autonomous detectors, Internet of Things requirements, and underground wireless connection is required.

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Date of Conference: 19-20 October 2024

DOI: 10.1109/ICCCMLA63077.2024.10871635

Date Added to IEEE *Xplore*: 11 February 2025

Publisher: IEEE

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Optimizing Natural Language Understanding: A Comprehensive Study of Python's Top Libraries

Publisher: IEEE Cite This PDF

B Pandurangaraju ; Balaraju Vijayalakshmi ; S Ashok Kumar ; K Uday Kumar Reddy ; Shaik Karimullah ; Fahimuddin Shaik **All Authors**

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Abstract:
Competent human-computer communication relies heavily on the ability to master natural language, where a strong understanding of grammar and context is crucial. As conversational interactions move beyond traditional interfaces, the integration of speech and text into daily communication systems is becoming seamless. At the forefront of this transformation is Natural Language Processing (NLP), the field that enables machines to comprehend, interpret, and respond to human language in a meaningful way. This study explores the evolving landscape of NLP, with a particular emphasis on the Python ecosystem and its libraries, which are essential tools for advancing language comprehension and processing. Python, due to its versatility and robust community support, has become a cornerstone in the development of NLP applications. By comparing and analyzing these Python libraries, this research offers a detailed examination of their functionalities, performance, and adaptability to various NLP tasks.

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Date of Conference: 19-20 October 2024

DOI: 10.1109/ICCCMLA63077.2024.10871883

Date Added to IEEE *Xplore*: 11 February 2025

Publisher: IEEE

ISBN Information:

Conference Location: Hamburg, Germany

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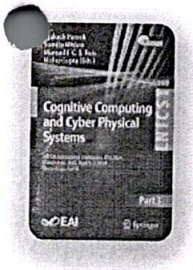
Development of IoT Multilingual Voice Controlled Home Automation System

| Conference paper | First Online: 09 February 2025

| pp 347–362 | Cite this conference paper



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Included in the following conference series: International Conference on Cognitive Computing and Cyber Physical Systems

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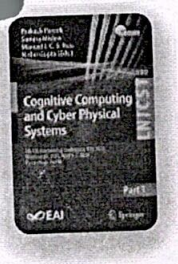
An Energy-Efficient 8-Tap FIR Filter Design in 22nm DTMOS Technology

| Conference paper | First Online: 09 February 2025

| pp 300–310 | Cite this conference paper



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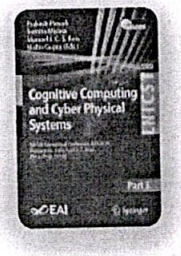
Performance Comparison of 4T SRAM Cell Using Different Techniques at 32nm and 22nm Nodes for Portable Electronic Devices

| Conference paper | First Online: 09 February 2025

| pp 311–322 | Cite this conference paper



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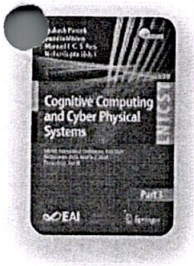
High-Performance 10T SRAM-Based Decoder for 4x4 Array

| Conference paper | First Online: 09 February 2025

| pp 289–299 | Cite this conference paper



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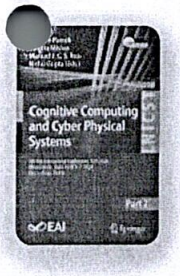
An AI-Powered Diagnostic Model for Detection of Lung and Liver Cancer

| Conference paper | First Online: 08 February 2025

| pp 252–271 | Cite this conference paper



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Industrial Fault Detecion System Using IoT Based Arduino and Node MCU

Proceedings of the 3rd International Conference on Optimization Techniques in the Field of Engineering (ICOFE-2024)

8 Pages
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M. Hanumanthu (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=7294426)
Annmacharya University

Date Written: November 15, 2024

Abstract

Gas leakage poses a significant threat in residential and commercial settings today. The imperceptible nature of gas makes it challenging to detect due to human limitations, lack of vigilance, or external factors. Elevated gas concentrations can lead to disastrous outcomes. This study explores an alternative approach to preemptively avert such catastrophes. The proposed system integrates embedded sensors, controllers, and IoT-based software. It employs various alerting mechanisms to monitor and detect LPG gas leaks. The system utilizes multiple sensors, including temperature and humidity sensors (DHT22), gas sensors (MQ6), flame sensors (LM 2903), and WiFi modules (ESPZ8266), to monitor different parameters. These sensors collect data within their respective domains and transmit it to the WiFi module for processing. The processed data is then sent to a cloud server for storage and analysis. Real-time alerts are generated and transmitted to the user's mobile device in case of any abnormal readings or potential gas leaks. This IoT-based system provides a comprehensive solution for early detection and prevention of gas-related accidents, enhancing safety in both residential and commercial environments.

Keywords: Sensors, Arduino, Wi-Fi module.

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Incorporating Grey Wolf Optimization and Recurrent Neural Networks for Accurate Brain Tumor Detection

Publisher: IEEE Cite This PDF

B. Umakanth ; Fahimuddin Shaik ; Shaik Karimullah ; K. Naga Shankar Reddy ; Peddapullaiahgari Hariobulesu ; Balaraju Vijayalakshmi **All Authors**

1 Cites in Paper

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Abstract

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I. Introduction

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IV. Result Analysis

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Abstract:
This study presents a novel methodology for brain tumor detection using a combination of advanced image processing techniques and the RXS-Net model, which integrates ResNet-50, Xception, and SVM. The method involves preprocessing steps such as image resizing, greyscale conversion, anisotropic diffusion filtering, and contrast enhancement. The proposed method achieves an accuracy of 98.93%, significantly outperforming other techniques. This high level of accuracy, along with the model's robustness, underscores its potential for improving diagnostic accuracy in medical imaging.

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Date of Conference: 27-28 September 2024

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Date Added to IEEE *Xplore*: 12 November 2024

Publisher: IEEE

Conference Location: Indore, India

ISBN Information:

Electronic ISBN:979-8-3503-8880-0

Print on Demand(PoD) ISBN:979-8-3503-8881-7

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Integrated Deep Learning Methodology for Early Glaucoma Detection and Diagnosis using Retinal Fundus Images

Publisher: IEEE Cite This PDF

G. Amjad Khan ; N. Deepthi ; Fahimuddin Shaik ; Pandurangaraju B. ; Shaik Karimullah ; Peddapullaiahgari Hariobulesu **All Authors**

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Abstract:
This study proposes a thorough methodology for diagnosing glaucoma in retinal fundus pictures using modern image processing and deep learning techniques. The photos are resized using Nearest Neighbor Interpolation before being converted to grayscale, noise reduced with a Kalman Filter, and contrast enhanced with Dualistic Sub-Image Histogram Equalization. Scale-Invariant Feature Transform (SIFT) is used to extract features, which are then processed by VGS Net, a deep learning network developed exclusively for glaucoma diagnosis. The methodology has been confirmed by extensive performance analysis, with an accuracy of 99.06%, precision of 99.19%, recall of 98.13%, and an F1 score of 97.65%. These findings show that the proposed technique is both effective and reliable, making it a promising tool for detecting early glaucoma in clinical settings.

Published in: 2024 International Conference on Advances in Computing Research on Science Engineering and Technology (ACROSET)

Date of Conference: 27-28 September 2024
DOI: 10.1109/ACROSET62108.2024.10743780
Date Added to IEEE *Xplore*: 12 November 2024
Publisher: IEEE
ISBN Information:
Conference Location: Indore, India

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Enhancing agricultural intelligence and sustainability with an intelligent irrigation system based on wireless sensor networks and fuzzy PID control

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Department of Computer Science and Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh, India

ABSTRACT: The Intelligent Irrigation System (IIS) is an innovative agricultural technology. This involves the integration of Wireless Sensor Networks (WSN) and Fuzzy Proportional-Integral-Derivative (PID) control. This helps in the optimization of water management in precision farming practices. These advanced techniques help in adopting effective water resource management with sustainable farming systems. The WSN component involves a network of wireless sensors across the agricultural field to monitor and gather the real-time data. The collected data are transmitted to a central control unit through a wireless medium. The application of Fuzzy PID control forms an important part of the intelligent irrigation system. This helps to obtain intelligent decisions based upon the sensor data. The demonstration of uncertainty is achieved using fuzzy logic systems. They help in handling the complex and diverse nature of agricultural atmospheres. The irrigation parameters are adjusted using the PID controller. This helps in the identification of crops which receive the optimal amount of water within the stipulated time. The integration of wireless communication and fuzzy PID control provides various advantages such as remote monitoring and control, intelligent decision-making and reduced environmental impact. Thus the developed system is designed in a way to meet the varying environmental conditions.

Keywords: Intelligent Irrigation System (IIS), Wireless Sensor Networks (WSN), Fuzzy Proportional-Integral-Derivative (PID) control, intelligent decision-making

DOI: 10.1201/9781003559092-40
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Integrated Methodology for Early Glaucoma Diagnosis Using Retinal Fundus Images

Publisher: IEEE Cite This PDF

S Ashok Kumar ; Pandurangaraju B ; Balaraju Vijayalakshmi ; P Phanindra Kumar Reddy ; Shaik Karimullah ; Fahimuddin Shaik **All Authors**

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Abstract:
This research explores a comprehensive methodology to glaucoma discovery using retinal fundus images, aiming to enhance diagnostic precision through advanced machine learning techniques. We begin with a diverse dataset of retinal images, applying bilinear interpolation for resizing, and convert images to greyscale using the Luminosity method to highlight relevant features. Noise is reduced using an adaptive Normalized Least Mean Squares (NLMS) filter, followed by histogram equalization to improve contrast. Feature extraction is accomplished using the method called Histogram of Oriented Gradients (HOG). These features are then classified with a combined model of ResNet-50 and Multiclass Support Vector Machine (MCSVM). The model's efficacy is evaluated using precision, accuracy, recall, and F1-score metrics, demonstrating high effectiveness with an 98.66% of accuracy, 98.99% of precision, and 97.87% of recall. Future work will focus on expanding the dataset, integrating multi-modal data, and enhancing model explainability to further improve glaucoma detection accuracy.

Published in: 2024 International Conference on Electrical Electronics and Computing Technologies (ICEECT)

Date of Conference: 29-31 August 2024

DOI: 10.1109/ICEECT61758.2024.10739184

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Publisher: IEEE

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Print on Demand(PoD) ISBN:979-8-3503-7810-8

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Design of 4-Bit Synchronous Counter Using TSPC-SVL T Flip-Flop for Power Reduction

Publisher: IEEE Cite This PDF

Syamala Devi P ; Pallavi P ; Raja Vikram P ; Ramachandra T ; Sathya Sai Reddy K **All Authors**

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IV. Simulation Results

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Abstract:
The primary objectives of low-power VLSI circuits are to enhance system performance by decreasing power consumption, optimizing chip sizes, and extending battery life. Scaling designs, like counters, can adjust system parameters based on previous states, enabling tracking of time and frequency. However, power consumption, particularly in standby mode dissipation, remains a key challenge for scaling circuits. The clock signal in a counter consumes one-third of its power. In this study, the number of switching actions is limited to reduce power usage. By lowering the flip-flop's power consumption, the counter's power consumption was further decreased. This could be achieved by combining SVL (Self-Controllable Voltage Level) with TSPC (True Single Phase Clock), and 6 transistor XOR gate. This 4-bit counter was designed with 45nm technology and Compared to the existing design, the new one consumes 27% less energy.

Published in: 2024 Second International Conference on Advances in Information Technology (ICAIT)

Date of Conference: 24-27 July 2024

DOI: 10.1109/ICAIT61638.2024.10690654

Date Added to IEEE *Xplore*: 04 October 2024

Publisher: IEEE

Conference Location: Chikkamagaluru, Karnataka, India

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Print on Demand(PoD) ISBN:979-8-3503-8387-4

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The Framework for Training and Validation of Healthcare System using Accurate Classifier Model

Publisher: IEEE Cite This PDF

R Sivapriyan ; Rashel Sarkar ; Y. Pavan Kumar Reddy ; S Loganayagi ; Doaa Saadi Kareem ; Al-Hussain Meassar **All Authors**

1 Cites in Paper

47 Full Text Views

Abstract

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III. Proposed Framework

IV. Results and Discussions

V. Conclusion and Future Scope

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Abstract:
Our novel strategy uses IoT-cloud technology to present a cognitive healthcare platform. This framework utilizes deep learning algorithms in conjunction with smart sensor integration to facilitate intelligent decision-making in the setting of smart cities. Our intelligent and cognitive framework provides accurate, efficient, and economical healthcare services by continually monitoring patients' vital signs in real-time. Here, we provide experimental results on deep learning-based EEG pathology categorization to verify the efficacy of our proposed system. We record and track many healthcare data modalities using a range of smart sensors, such as EEG sensors. Patients' EEG data are effortlessly sent to the cloud via Internet of Things devices, where a cognitive module processes and analyzes them. Through the analysis of sensor data, including voice, gestures, motions, and EEG signals, this system assesses the patient's state. Real-time decisions, crucial for determining the appropriate course of action, are made by the cognitive module. Additionally, EEG signals are processed by a deep learning module to classify them as pathological or normal. The insights gleaned from patient monitoring and EEG signal analysis are then shared with healthcare providers. This helps them to precisely evaluate the patient's state and quickly offer emergency care if needed. Notably, our proposed deep learning model outperforms existing systems in terms of accuracy and reliability, underscoring its potential for transforming healthcare delivery.

Published in: 2024 4th International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE)

Date of Conference: 14-15 May 2024

DOI: 10.1109/ICACITE60783.2024.10616861

Date Added to IEEE *Xplore*: 09 August 2024

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Conference Location: Greater Noida, India

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Electronic ISBN:979-8-3503-6016-5

Print on Demand(PoD) ISBN:979-8-3503-6017-2

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Emotion Recognition from Physiological Signals Using Ensembled Machine Learning Strategy

Publisher: IEEE Cite This PDF

S. Fayaz Begum ; Fahimuddin Shaik ; Shaik Karimullah ; D. Mahalakshmi ; T. Lavanya ; M. Naveenkumarraju **All Authors**

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IV. Result and Analysis
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Abstract:
The field of emotion recognition by physiological signal analysis is the subject of the proposed study. Its primary objective is to evaluate how effectively various classifiers predict two important emotional variables: valence and arousal. Three distinct classifiers are used in the study: kELM (Kernel Extreme Learning Machine), nELM (Neural Extreme Learning Machine), and sSOM (Simplified Self-Organising Map) in order to give a comprehensive comparison analysis. The script contributes to the advancement of emotion perception by carefully contrasting the capabilities of multiple classifiers. By using the dataset, the research hopes to clarify the benefits and drawbacks of each classifier and contribute to the development of more dependable and precise emotion identification algorithms. The suggested study focuses on the area of physiological signal processing for emotion identification. Its main goal is to assess how well different classifiers perform in predicting valence and arousal, two crucial emotional variables.

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ISBN Information:
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Print on Demand(PoD) ISBN:979-8-3503-7181-9

Conference Location: Bengaluru, India

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Extreme Learning Machine (ELM) Algorithm for the Detection of Diabetic Retinopathy

Publisher: IEEE Cite This PDF

Peddapullaiahgari Hariobulesu ; Fahimuddin Shaik ; Shaik Karimullah ; Lakshmi Bhanu ; Madhavi B ; Kiran G **All Authors**

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2. Literature Survey

3. Methodology

4. Result and Analysis

5. Conclusion & Future Scope

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Abstract:
Blood vessel recognition is crucial for many medical image analysis applications, such as diagnosis and screening for diabetic retinopathy. However, manual de-tection can take a while. To address this, re-searchers have developed a method that uti-lizes an Extreme Learning Machine (ELM) in a supervised manner to segment blood vessels in the retina. The process involves several stages, including pre-processing images, unsupervised and supervised learning, and post-processing techniques. During the pre-processing stage, various techniques such as image cropping, color modification, enhancement of contrast, Gabor processing, and rectification using half-waves are used to pre-process the images. The pre-processed images are utilized to create a feature vector and used for Principal Component Analysis (PCA). Pixels are separated into non-vessel and vessel clusters using clustering based on K-means on the PCA result. The ensemble classification process is then applied to the non-vessel region using root-guided decision trees with bagging. Finally, the outcomes of the ensemble classification and clustering methods are combined to produce the final segmentation image. Post-processing techniques, such as morphological approaches, are used to improve the vessel-segmented output. The proposed method is verified using publicly available photos from the DRIVE database and achieves an accuracy of 95.36% with higher sensitivity, indicating that more vessel pixels are detected effectively.

Published in: 2024 International Conference on Electronics, Computing, Communication and Control Technology (ICECCC)

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DOI: 10.1109/ICECCC61767.2024.10593933

Date Added to IEEE *Xplore*: 23 July 2024

Publisher: IEEE

ISBN Information:

Conference Location: Bengaluru, India

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Integrated Rasnet Model for Efficient Automated Assessment and Sorting of Leaf Diseases in Agriculture

Publisher: IEEE Cite This PDF

B. Lakshmi Devi ; Fahimuddin Shaik ; Shaik Karimullah ; B. Nandini ; J. Hemalatha ; S. Jagadeeswar Reddy **All Authors**

19
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Abstract:
A novel integrated methodology for the automated assessment and sorting of leaf diseases in agricultural settings is provided in this work. The method improves the efficiency and accuracy of disease evaluation by combining deep learning and machine learning methodologies. Pre-processing techniques like contrast enhancement and color space conversion are the first steps in the research process since they set the conditions for further investigation. K-Means clustering is used to divide the image into regions, enabling user input for the purpose of selecting the disease region. In this work we proposed RASNet model (Recurrent and SVM Hybrid Network for Enhanced Leaf Disease Classification). A more complete texture analysis is made possible by highlighting the significance of picture preprocessing. The purpose of introducing a Recurrent Neural Network (RNN) strategically is to extract temporal dependencies and sequential patterns from picture data. Combined with carefully collected texture data, these RNN outputs help classify diseases using a Multiclass Support Vector. We have used images of leaves affected by different bacterial and fungal diseases: Alternaria Alternata, Anthracnose, Bacterial Blight and Cercospora Leaf Spot in our experiment and our proposed method.

Published in: 2024 International Conference on Electronics, Computing, Communication and Control Technology (ICECCC)

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DOI: 10.1109/ICECCC61767.2024.10593830

Date Added to IEEE *Xplore*: 23 July 2024

Publisher: IEEE

ISBN Information:

Conference Location: Bengaluru, India

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ECE-5D

Optimizing Depression Detection Through IVMPNet: A Fusion of Inception V4 and MLP

Publisher: IEEE Cite This PDF

Lakshmi Devi Bodagala ; Harsha Nandini Peddireddy ; Aparna Guntakanti ; Gopala Krishna Pujari ; Harsha Vardhan Danasi ; Tejaswi Murarri **All Authors**

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IV. RESULTS

V. CONCLUSION

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Abstract:
This research employs the CK+ (Cohn-Kanade Plus) dataset obtained from CMU's Perception Lab to enhance the detection of depression through the IVMP-Net framework, which integrates Inception V4 and Multilayer Perceptron (MLP) networks. A graphical user interface (GUI) developed in MATLAB streamlines the entire workflow, encompassing video input processing and the identification and categorization of facial emotions such as anger, disgust, happiness, neutrality, and sadness. By examining the prevalence of these emotional states, the system assesses depression levels and classifies them as mild, moderate, or severe. The methodology demonstrates an impressive overall accuracy of 98.9%, bolstered by precision, sensitivity, specificity, and F-score metrics that affirm the model's reliability. The analysis of the confusion matrix and performance indicators highlights the model's efficacy, suggesting its applicability for real-time emotion monitoring and automated mental health evaluations. This innovative approach provides a dependable mechanism for the early identification and intervention of depression, utilizing sophisticated deep learning methodologies to improve the precision and dependability of mental health assessments.

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Conference Location: Erode, India

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Proceedings of the 6th International Conference on Inventive Research in Computing Applications (ICIRCA-2025)
DVD Part Number: CFP25N67-DVD; ISBN: 979-8-3315-2141-7

Towards Real-Time Lung Cancer Diagnosis: A Deep Learning Approach with Optimized CNN for CT Scan Analysis

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Abstract -Lung cancer continues to be among the deadliest illnesses globally, calling for early and precise diagnosis for better patient outcomes. This research introduces an automated system of lung cancer diagnosis via deep learning and medical imaging. A Convolutional Neural Network (CNN) model was constructed and trained using a balanced data set of 200 CT scan images, with 100 malignant and 100 benign cases. The dataset was preprocessed by reducing noise, enhancing contrast, and augmenting to enhance robustness. The CNN model consisted of four layers of convolution for feature extraction, max-pooling layers to reduce dimensions, and fully connected layers for classification. The model was trained with the Adam optimizer and trained for more than 30 epochs. Performance on the test set achieved accuracy of 92.5%, precision of 91.2%, recall of 93.8%, and an F1-score of 92.5%, validating its performance in identifying malignant versus benign cases. Comparison with VGG16 and ResNet50 verified better performance, and a mean processing time of 2.5 seconds per image assured applicability in real-time systems. Error analysis revealed slight misclassifications from overlapping features and tiny tumor sizes. The research emphasizes the promise of AI-based diagnostic instruments in medical imaging and recommends improvement in the future, such as training on large datasets and adding explainable AI for better interpretability and clinician adoption.

Keywords: Lung cancer diagnosis, Deep learning, Convolutional Neural Networks (CNN), Medical imaging, AI in healthcare

I. INTRODUCTION

Early specific cancer detection remains necessary because cancer continues to be one of the world's main death-causing agents [1]. The traditional diagnostic approaches consisting of histopathological examination and radiological scans depend on human reading capabilities while also showing susceptibility to human errors and requiring time at the same time they depend on medical expertise [2]. Medical diagnostics received a breakthrough with deep learning a branch of artificial intelligence which brings automated disease detection to medical diagnostics while using accurate and efficient methods [3]. Convolutional neural networks (CNNs) demonstrate exceptional results when applied to medical imaging which leads to the identification of cancer tumors that are either malignant or benign across different cancer types. Machine learning uses extensive medical image databases such as computed tomography (CT), magnetic resonance imaging (MRI) and mammograms as well as histopathological slides to identify complex patterns while making specific predictions [4]. Deep learning algorithms enable automated cancer diagnosis benefits diagnostic precision and reduces pathologist and radiologist workload and facilitates early detection which leads to better patient results [5].

Deep learning applications in medical imaging led to the development of computer-aided diagnostic systems to enable better cancerous lesion detection by healthcare professionals [6]. These diagnostic systems both constrain the diagnostic variations and help identify smaller tests that generally escape standard testing procedures [7]. These deep learning models develop their forecasting accuracy through continuous self-learning of patterns which enables them to handle fresh medical information and refine their precision [8]. The medical diagnostic field gains new capabilities through AI to automate healthcare systems particularly within regions which lack specialized medical personnel. Deep learning applications face multiple implementation barriers during cancer diagnosis

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Hybrid Deep Learning Algorithm to Predict Leaf Diseases for Botanical Sentinals

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Abstract. When it comes to maintaining a growing population and supporting a healthy economy, the agriculture sector is primary. Infectious plant diseases threaten biodiversity and could result in crop losses. In agriculture, early disease detection and identification from leaf photos using machine learning is a tough but crucial topic of study. Since agriculture is a significant economic factor in India (17% of GDP), there is an urgent need for studies of this nature to be conducted there. Profits for farmers and national GDP can both benefit from more efficient and better crop products. This study proposes a novel approach that combines convolutional neural networks with support vector machines to accurately diagnose 10 distinct illnesses associated with holy basil. CNNs with full connectivity, max-pooling, & convolutional layers are used in this model to automatically extract relevant features from input images. SVMs use these characteristics to make diagnoses. Evaluation measures like as precision, recall, F1-score, and total accuracy reflect the model's effectiveness. Important in practical agricultural contexts is its capacity to manage data with discrepancies, which is supported by micro-average, macro-average, and weighted-average accuracy ratings.

Keywords: plant diseases · Deep Learning (DL) · Transfer Learning (TL) · Food Security

1 Introduction

As one of the world's largest industries, agriculture provides vital support in the forms of food, income, & employment. Since there are so many farmers in India and other low and middle income nations, agriculture accounts for 18% of national income and 53% of total employment [1]. The share of agriculture's GVA in the country's total economy has risen from 17.6% up 20.2% during the past three years [2]. The majority of the

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https://doi.org/10.1007/978-3-031-78940-3_44

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Analysis and Prediction of Crime Hotspots Using Machine Learning with Stacked Generalization Approach

| Conference paper | First Online: 19 November 2025

| pp 240–246 | Cite this conference paper



Proceedings of the 7th International Conference on Communications and Cyber Physical Engineering

(ICCCE 2024)

S. Mahammad Rafi, B. Naveen Kumar, K. Balaji Reddy, J. Pavan Kumar, P. Datta Sai Prem Prathap Reddy & P. Harith

Part of the book series: Lecture Notes in Electrical Engineering ((LNEE,volume 1466))

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- International Conference on Communications and Cyber Physical Engineering 2018

574 Accesses

Abstract

The ensemble learning approach is a cooperative decision-making system that generates new examples by combining the predictions of learnt classifiers. The early analysis has demonstrated that the ensemble classifiers are far more reliable than any single part classifier, both conceptually and experimentally. Even with the presentation of multiple ensemble approaches, determining the right configuration for a given

Battery Monitoring and Control System for EV using IOT Technology

Publisher: IEEE Cite This PDF

SiripiReddy Venkateswarlu Reddy ; Pasala Gopi ; CH. Hussaian Basha ; M. Mujahid Irfan ; K Shivashanker ; Daruru Sarika **All Authors**

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Abstract:
Electric vehicles represent a significant advancement for the automobile industry, promoting a more sustainable future with their eco-friendly approach and reduced fuel dependence. The battery is the primary source of energy for an electric vehicle. A reliable and real-time monitoring system is crucial to ensure the safety, performance, and longevity of the EV battery packs. This paper proposes an Internet of Things (IoT) based Battery Monitoring and Control System to monitor the vital parameters of electric vehicle batteries in real-time. This system utilizes the Internet of Things (IoT) to monitor and control electric vehicle functions automatically. Embedded sensors gather data which is then communicated through the Ubi Cloud protocol for autonomous management. The results depict various battery parameters, such as voltage, temperature, and humidity.

Published in: 2024 Third International Conference on Trends in Electrical, Electronics, and Computer Engineering (TEECCON)

Date of Conference: 07-08 November 2024

DOI: 10.1109/TEECCON64024.2024.10939820

Date Added to IEEE *Xplore*: 01 April 2025

Publisher: IEEE

ISBN Information:

Conference Location: Bangalore, India

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An Enhanced Repetitive Control Framework for Adaptive Neuro-Fuzzy Learning Grid-Connected Inverter with Current Control and Frequency Adaptability

Publisher: IEEE Cite This PDF

SiripiReddy Venkateswarlu Reddy ; O. Hemakesavulu ; CH. Hussaian Basha ; M. Mujahid Irfan ; Daruru Sarika ; Dudekula Gouse Peera **All Authors**

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III. Improved repetitive current controller's design

IV. Results and Discussion

V. Conclusion

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Abstract:
This work proposes an advanced repeated control method (RCM) for a frequency adaptable grid-connected inverter based on fuzzy current control. The primary goal of the suggested strategy is to lower total harmonic distortion (THD) by adjusting the FIR filter in accordance with shifting grid frequencies while maintaining resonant frequencies that match both the fundamental and harmonic grid frequencies. When it is necessary that the sampling frequency ratio be an integer, the repeated control system is chosen due to its high efficiency in tracking periodic signals and low output total harmonic distortion (THD). The RCM's resonant frequencies will deviate from the actual grid's fundamental and harmonic frequencies in an industrial setting where the ratio may not be an integer. As a result, the system's performance may be negatively impacted. against determine whether the suggested control method improves performance, it is compared against a conventional repeated control strategy that uses a PI controller. Through trials conducted at various frequencies, the control approach is assessed in grid-connected mode. The suggested controller successfully demonstrates its superiority over alternative control schemes with regard to the inverter systems' THD level and component harmonic.

Published in: 2024 Third International Conference on Trends in Electrical, Electronics, and Computer Engineering (TEECCON)

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DOI: 10.1109/TEECCON64024.2024.10939415

Date Added to IEEE *Xplore*: 01 April 2025

Publisher: IEEE

ISBN Information:

Conference Location: Bangalore, India

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Innovative MPTSSNet with Modified Dung Beetle Algorithm for Superior Remote Sensing Performance on UC-Merced and SIRI-WHU Datasets

Publisher: IEEE Cite This PDF

Cuddapah Anitha ; R Mahaveerakannan ; Baskar Duraisamy ; K Karpagavalli **All Authors**

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Abstract:
Many fields rely on land division classification in satellite imagery, including urban planning, environmental monitoring, remote scene analysis, earth observations, and remote surveillance. The land scene classification job has many benefits, so many that numerous approaches to automatically identify land scenes in remote sensing photos have been suggested in recent years. Creating deep networks that can recognise land landscapes in high-resolution satellite photos is where most of the effort is concentrated. But distinguishing between various geographical scenes is a problem for these algorithms. Common obstacles that limit the models' ability to attain high performance include complex textures, busy backgrounds, extremely small objects, and substantial fluctuations in object scale. A new architecture for remote sensing picture categorization, Multi-Path Temporal State Space Representation (MPTSSNet), is introduced in this study. An efficient, hardware-aware architecture called the Mamba is incorporated into MPTSSNet, which is based on the State Space Model (SSM). It combines the best features of linear modelling complexity with a global receptive field. We present a dynamic multi-path activation method to enhance Mamba's ability to represent non-causal data, thereby addressing the shortcoming of vanilla Mamba—its inability to adapt to twodimensional picture data and its only focus on causal sequences. To improve the algorithm's capacity to avoid local optima, this work tunes the MPTSSNet parameters using a modified dung beetle optimisation algorithm (MDBO). The approach employs Latin hypercube sampling for better population initialization. Two benchmark datasets, SIRI-WHU and UC-Merced, are used to assess the presentation of the suggested framework. Our experimental results demonstration that the framework outperforms competing models in its class..

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Date of Conference: 06-07 September 2024

DOI: 10.1109/ACOIT62457.2024.10939148

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Publisher: IEEE

ISBN Information:

Conference Location: KOLAR, India

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Facial Sentiment Analysis: Enhancing Emotion Recognition Through Advanced Convolutional Neural Network Architectures

Daruru Sarika [a], Palepu Suresh Babu [b], Potladurthy Suresh Babu [c], Pasala Gopi [b], S.Venkateswarlu [b], P.B. Chennaiah [b]
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***Abstract*—The domain of Computer Vision has observed the emergence of Facial Sentiment Analysis as a critical area, elucidating human emotions expressed through facial features. This investigation focuses on emotion recognition, specifically emphasizing the utilization of advanced Convolutional Neural Network (CNN) architectures to enhance the precision and efficacy of sentiment analysis. Despite considerable advancements, robust development of facial emotion recognition systems encounters persistent challenges. A primary hurdle involves addressing the inherent variability in human facial expressions, shaped by cultural, individual, and contextual influences. Overcoming the complexities associated with cross-cultural and cross-demographic generalization demands innovative solutions. Additionally, the scarcity of extensive and diverse annotated datasets poses a challenge in building highly generalized models. This study explores strategies to tackle these challenges, employing transfer learning techniques and data augmentation methods to bolster model generalization. Furthermore, the application of facial sentiment analysis in real-world scenarios necessitates models that not only ensure accuracy but also provide interpretability and explanation. The research delves into methods to enhance model interpretability, offering insights into the decision-making processes of neural networks, thereby fostering trust and acceptance in practical applications. Through a comprehensive examination of these challenges, this research contributes to the ongoing advancement in facial sentiment analysis, paving the way for more reliable and universally applicable emotion recognition systems.**

Keywords— Facial Sentiment Analysis, Convolutional Neural Network (CNN),Emotion Recognition, Generalization, Transfer Learning, Model Interpretability

I. INTRODUCTION (*HEADING 1*)

In the rapidly evolving landscape of Computer Vision, the burgeoning field of Facial Sentiment Analysis has become integral, offering profound insights into the intricate realm of human emotions expressed through facial features. As technology advances, the precision and efficacy of emotion recognition systems have become focal points for improvement. This study embarks on a comprehensive exploration of this domain, placing particular emphasis on the utilization of advanced Convolutional Neural Network (CNN) architectures to elevate the accuracy and effectiveness of Facial Sentiment Analysis.

Despite considerable strides in recent years, the development of robust facial emotion recognition systems encounters persistent challenges. A critical hurdle involves navigating the inherent variability in human facial expressions, influenced by cultural nuances, individual differences, and contextual factors. Tackling the complexities associated with cross-cultural and cross-demographic generalization demands innovative solutions. Furthermore, the scarcity of extensive and diverse annotated datasets poses a hindrance to creating models with high generalization capabilities. This research strategically addresses these challenges, employing cutting-edge techniques such as transfer learning and data augmentation to enhance the generalization of facial emotion recognition models.

In addition to technical challenges, the study recognizes the practical demands of applying facial sentiment analysis in real-world scenarios. Beyond delivering accuracy, the models must also be interpretable and explainable. The research u to unravel the decision-making processes of neural networks, providing insights that enhance trust and acceptance in practical applications. By dissecting and addressing these multifaceted challenges, this research contributes to the continual advancement of facial sentiment analysis, envisioning a future with more dependable and universally applicable emotion recognition systems.

II. LITERATURE REVIEW

In the ever-evolving realm of Computer Vision, Facial Sentiment Analysis stands out as an essential discipline, deciphering the nuanced expressions of human emotions conveyed through facial features. With technological advancements, the pursuit of accuracy and efficiency in emotion recognition systems has become increasingly important. This review delves into a thorough examination, particularly emphasizing the utilization of advanced Convolutional Neural Network (CNN) architectures to amplify the precision and effectiveness of Facial Sentiment Analysis[1-2].

The historical development of Facial Sentiment Analysis can be traced back to pioneering contributions by Ekman and Friesen (1971), establishing the groundwork for comprehending universally recognized facial expressions and paving the way for subsequent research in automated emotion recognition[3-4].Conventional methods that depend on manually crafted

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Effective Minimization of Fraud using a Hybrid Novel Approach on Social Media

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Abstract – In a social context, optimizing information retrieval and user engagement is paramount. The challenges identified are the large volume of data, ensuring accuracy, and performance requires evolutionary structures. A novel approach is needed that combines machine learning algorithms with evolutionary optimization techniques to automatically recommend and refine tags on known segments of social media content. This safeguards against user attention diversion and potential risks to personal information. Activities encompass automated form feedback solicitation, user-reported content negativity flagged with custom tags in red, precise identification and processing, and accuracy validation. The process initiates with an initial set of tags generated through natural language processing (NLP) techniques, subsequently honed using a genetic algorithm. This iterative process refines tag selection based on content relevance, markedly augmenting tagging precision. Concurrently, a machine learning model analyzes user behavior patterns and preferences, fine-tuning tag recommendations based on historical data. The hybrid approach surpasses conventional tagging systems, exhibiting adaptability and learning capabilities that dynamically adjust tag recommendations to mirror emerging trends and individual user interests. Additionally, integrated user feedback mechanisms fine-tune the hybrid optimization model, enabling continuous enhancement and customization. Presently, web platform owners prioritize user engagement by eliminating misleading content segments. As the volume of social media content burgeons, this approach offers a scalable and effective solution to elevate content discoverability and relevance in the digital landscape.

Keywords: Misleading behavior, Tags, Recommendations, Optimization, Efficiency, Accuracy, and Social media content.

1. Introduction

In our daily lives, the number of customers who are trapped in scenarios of high discounts or high monetary benefits availing through specific web portions is increasing. The awareness is to be created among the people to avoid losses. In the case of resources in the cloud, there are also chances of providing portions that may lead to loss, which would be scrutinized and filtered by the adoption of advanced approaches in the cloud provider. In case of unknown content, first users would experience the loss, later the portion which leads to loss would be tagged and reported by the experienced odd user so that future users won't click or won't proceed with such portions. In the case of a high

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Predicting Euro-to-Dollar Exchange Rates Using Machine Learning

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Abstract—In the fast-moving world of forex trading, accurately predicting currency trends can significantly impact investment decisions. The EUR/USD currency pair, one of the most actively traded pairs globally, experiences fluctuations driven by various market factors, including economic reports, geopolitical developments, and market sentiment. Traders, ranging from experienced professionals to individual investors, constantly seek strategies to gain a competitive advantage. This paper explores the practical use of machine learning to predict trends in the EUR/USD market. By leveraging historical market data, we extract key technical indicators such as Average True Range, Relative Strength Index, and Simple Moving Averages widely used tools in technical analysis. These features are fed into a K-Nearest Neighbors algorithm to predict whether the market will trend upwards, downwards, or remain uncertain in the near term. This approach is particularly valuable as it combines traditional technical analysis with the advanced capabilities of machine learning, providing traders with a more data-driven method to guide their decisions. In addition, our model incorporates moving averages and trend slopes to refine its predictions, mimicking how traders analyze market behavior over time. We employ a time-series split validation technique to simulate real-world market conditions and ensure the model's robustness in handling unseen data. The results demonstrate promising levels of accuracy, offering a valuable tool for traders looking to enhance their forecasting abilities and make better-informed decisions in the ever-evolving forex market. Further, this method highlights the potential of machine learning in adapting to dynamic market conditions and evolving alongside the trading landscape.

Keywords—EUR/USD prediction, machine learning, forex market, K-Nearest Neighbors, technical analysis, exchange rate forecasting, Average True Range, Relative Strength

1. Introduction

In the forex market, the Euro-to-Dollar (EUR/USD) exchange rate is one of the most widely traded currency pairs, influencing global trade and economic dynamics. Predicting fluctuations in this rate is crucial for investors, traders, and financial institutions. [1] This project leverages machine learning techniques to forecast EUR/USD trends based on historical data and technical indicators. The goal is to develop an intelligent model that helps in decision-making by identifying potential buy, sell, or hold opportunities, thus optimizing trading strategies. [2] Using a Random Forest model, the project processes key technical indicators such as the Average True Range (ATR), Relative Strength Index (RSI), and moving averages (MA40, MA80, MA160). These features are essential in understanding market volatility, momentum, and price trends. By analyzing patterns in these

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Beam Phenomenon in Dual-Polarized Antennas Using MIMO

K. Riyazuddin, B. Abdul Raheem, S. Bajid Vali, Pabbati Swathi, B. Rakesh Babu, and S. M. D. Fayaz Basha

Abstract A significant step towards omnipresent communication systems and frictionless high-quality wireless connectivity will be made by the next wireless communications. Having dual-polarized antennas just at base station and consumers, an enormous MIMO system based on a single cell is considered in this research. We examine a dual-polarization channel model which takes into consideration a number of practical problems like cross-polar correlation (XPC), cross-polar discrimination (XPD) at the receiver and transmitter. We evaluate the potential spectral efficiency of either uplink or downlink (SE), as well as without consecutive interference cancellation, for such zero-forcing, linear minimal mean squared error, combining/precoding schemes (SIC) and maximum ratio (MR). Here, we analytically contrast the configurations of the uni-polarized and dual-polarized antennas. Evaluation is done on downlink and uplink spectral efficiencies. The equation demonstrates how using polarization region can boost the multiplexing gain. We note that a dual-polarized array having half as many antennas has the exact dimensions, beamforming gain by polarization as uni-polarized array. As a result, size can also be decreased while the SE is maintained or enhanced.

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FCS-MPC Based Grid-Tied Self-Balanced Switched Capacitor Reduced Switch Nine Level Inverter

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Ganesh Challa ; S. Sarada ; D. Sarika ; N. M. G. Kumar ; N. Ravisankara Reddy ; M. Damodar Reddy **All Authors**

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Abstract
Document Sections
I. Introduction
II. Switched Capacitor 9-Level Inverter
III. Finite Control Set Model Predictive Control
IV. Results and Discussion
V. Conclusion
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Abstract:
Switched-Capacitor Multi Level Inverter (SCMLI)s are becoming increasingly popular due to its application with low voltage input sources. This article suggests a new single dc source double boost MLI to overcome existing inverter limitations, such as their large number of elements. The suggested inverter uses Switched capacitor unit having self-balanced capabilities. This MLI charges capacitors stage by stage using a low voltage DC source, resulting in capacitor amplitudes that are several times the supply voltage. This asymmetrical capacitors produce a large magnitude of output voltage, reducing the need for many DC sources and semiconductors. This simplifies the structure. The suggested inverter employs single DC supply of low voltage, making it suitable for renewable energy applications. This converter may provide negative output voltage despite the high voltage H-bridge circuit, which reduces the quantity of devices. To validate the suggested MLI operation, a 9-level inverter model is emulated using Simulink environment of the MATLAB using Nearest Level Modulation (NLM). Also, the effectiveness of this topology is tested as a Grid Tied Inverter (GTI) with Finite Control Set Model Predictive Control (FCS-MPC) approach.

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Healthcare Information Systems and Study of Machine Learning Technology for Cancer Detection

Publisher: IEEE Cite This

T. Naresh ; B. Gouri ; S.Riyaz Banu ; Y. Sravanthi ; R. Lakshmi Narayana ; Y. Sumedh Kumar All Authors

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Abstract

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II. Machine Learning Methods

III. Challenges in Classifications of Cancer Patients

IV. Classifying Cancer Detection Machine Learning Techniques

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Abstract:
Cancer remains a significant global health challenge, with early and accurate diagnosis crucial for effective treatment. While traditional methods have relied on statistical approaches, the complexity of cancer necessitates more sophisticated techniques. This study explores the application of machine learning in cancer diagnosis, focusing on the classification of tumors as benign or malignant. By analyzing multidimensional medical data, machine learning algorithms can effectively identify patterns and predict cancer risk with greater accuracy than traditional methods. The study investigates the potential and limitations of machine learning in cancer diagnosis, addressing challenges such as data quality, model interpretability, and ethical considerations. The findings of this research contribute to the advancement of cancer diagnosis and pave the way for improved patient outcomes.

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Brain Tumor Classification from MRI Scans Using a Novel CNN Architecture and Optimization Techniques

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Abstract. Classification of brain tumours is crucial for computer-aided diagnostics (CAD) in health assessments. In light of the extensive procedures involved, manually identifying brain tumors using magnetic resonance imaging (MRI) is frequently labor-intensive and difficult, with the possibility of errors in detection and classification. Healthcare has significantly benefited from current developments in Deep Learning (DL), which have greatly enhanced the automation of medical image processing and diagnoses. One subclass of DL techniques, Convolutional Neural Networks (CNNs), is particularly good at visual learning and image categorization. To categorize brain tumours into three groups: gliomas, meningiomas, and pituitary tumours, we introduced the CNN method. We assessed the algorithm's performance using a benchmark dataset and contrasted it with pre-trained models already in use, including VGG16, VGG19, ResNet50, MobileNetV2, and InceptionV3. According to the experimental findings, our suggested model had a high classification accuracy of 98.5%, with 99% precision, recall, and f1-score. These outcomes suggest that our approach accurately classifies the most prevalent brain tumours. The algorithm is a valuable tool to help clinicians identify brain tumours quickly and accurately because of its excellent generalization ability and speed of execution.

Keywords: Brain Tumor · MRI · CNN · Deep Learning · Transfer Learning

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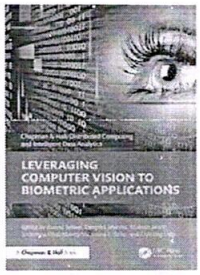

Novel Efficient Approach that Enhances Security over Biometric Systems Using Computer Vision Techniques

By S. Hrushikesava Raju (/search?contributorName=S. Hrushikesava Raju&contributorRole=author&redirectFromPDP=true&context=ubx), Shaik Jumlesha (/search?contributorName=Shaik Jumlesha&contributorRole=author&redirectFromPDP=true&context=ubx), Ururuturu Sesadri (/search?contributorName=Ururuturu Sesadri&contributorRole=author&redirectFromPDP=true&context=ubx), Ashok Koujalagi (/search?contributorName=Ashok Koujalagi&contributorRole=author&redirectFromPDP=true&context=ubx), Adinarayana Salina (/search?contributorName=Adinarayana [illegible]na&contributorRole=author&redirectFromPDP=true&context=ubx), N. Merrin Prasanna (/search?contributorName=N. Merrin Prasanna&contributorRole=author&redirectFromPDP=true&context=ubx)

Book Leveraging Computer Vision to Biometric Applications (https://www.taylorfrancis.com/books/mono/10.1201/9781032614663/leveraging-computer-vision-biometric-applications?refId=f1bba91b-08aa-4980-9890-1d26608a47a5&context=ubx)

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ABSTRACT

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Accident Severity Detection Using Machine Learning Algorithms

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Abstract

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2024 International Conference on Distributed Systems, Computer Networks and Cybersecurity (ICDSCNC)

Optimizing Job Shop Scheduling with Dynamic Arrivals using the Deep SOMs Approach

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***Abstract*—Modern manufacturing companies are more focused on serving the diverse demands of consumers in a timely manner, thanks to the exponential rise of globalization and information technology. Job shop manufacturing is characterized by a focus on small batches and a propensity toward producing a variety of products, which is why it has been an important production method for many industrial manufacturing enterprises.Data preprocessing, model training, and feature selection are the three stages that make up this suggested method. Step one is preparing the data to make it more accurate and reliable; step two is changing the data's structure to make it more usable by machine learning algorithms. The concept of feature selection is based on the premise that features connected to individual fitness and its contribution to individuals are important. The use of a Deep SOM persisted throughout training. This novel method outperforms SOM and ELM with an average accuracy of 92.63%.**

Keywords*—dynamic job shop scheduling, self-organizing maps (SOM), job shop control.

I. INTRODUCTION

In view of the fast developments in globalization and information technology, a major issue for modern manufacturing organizations has been how to quickly meet the diverse expectations of consumers. Shop manufacturing has long been a mainstay for many industrial manufacturing companies because of its traits, which point to a preference for small-batch production and a propensity for producing multiple varieties. Perhaps the best-known combinatorial optimisation problem is the job shop scheduling problem (JSSP). There have been a number of methods to static JSSP solutions that have emerged from decades of research and development. New job openings and other real-time occurrences may be more common in a dynamic market. Therefore, it is essential to give more consideration to dynamic scheduling problems in modern manufacturing that account for new occupations. Because scheduling is so important to system efficiency, it is an essential component of production management [1]. The scheduling process can be used to establish a production schedule for a set of jobs and resources. A production schedule specifies the beginning and ending times of all jobs that are allocated to resources [2]. Scheduling issues are usually portrayed as static problems in the operations research literature. Problems like the job shop scheduling problem (JSSP) are notoriously difficult to solve computationally. The time required to finish each operation is fixed, and there is an exact technical sequence in which they must be executed. To achieve performance objectives, a JSS problem primarily seeks to determine the optimal schedule for completing all tasks [3]. A dynamic PFSP, this one makes use of unpredictable interruptions and dynamic job arrival. There are a lot of disruption scenarios that this method accounts for, including machine failure, new job arrival, job cancellation, processing, and release variance. To resolve the FSP, the online TD approach based on linear gradient-descent function approximation was employed. Taking workshop dynamics into account, we are investigating the real-time scheduling problem and putting several dispatching rules into action.A deep SOM architecture may learn features from many resolutions simultaneously. Our hypothesis is that this capability enhances the model's classification accuracy and generalisation capabilities. Our hypothesis is that this will result in a shallower model than the DSOM, leading to shorter training times. The remainder of the paper is organised as follows. The study is organised as follows: Section II contains the algorithm, Section III presents the experimental setup and findings, and Section IV closes with future directions.

Individual agents would be responsible for dispatching projects according to the available resources, according to an adaptive reactive job shop scheduling technique proposed by [4]. The agents were trained using a neural reinforcement learning technique, which involves trial and error. Using variable neighborhood search (VNS), [5] suggested a reactive scheduling technique for a job shop that is constantly changing and experiences random job arrivals and machinery failures. Any time during the rescheduling process, an artificial neural network (ANN) could be used to adjust the VNS's settings. A strategy for adaptable, real-time manufacturing facilities that uses gene expression programming problem with adding new jobs to the schedule, where the right instructions for sending out automated process rearrangement and task distribution and evolution was aided by genetic operators [6]. New approaches to dispatching protocols for a dynamic workshop that makes use of incremental releases and expanded technical precedent boundaries to decrease total tardiness [7]. It was found by the researchers that both the quantity of substantial technical little time and tight due dates. Integrating periodic rescheduling with multi-phase quantum particle swarm optimization developed HMQPSO on behalf of a versatile work shop that handles new job entries, machine breakdowns, in terms of shipment [8]. They discovered that

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AI&DS - 1 (1)

Advanced Recruitment Strategies in Business Intelligence Systems: A Comparative Study of Machine Learning Models

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Abstract: This project features Streamlit-based software that uses business insights to improve the hiring process. Users can upload resumes in various formats (PDF, DOCX and plain text), and the application will extract and pre-process the material before comparing and analyzing it using machine learning models. By using spaCy's natural language processing framework, the system picks up redundancies in resumes to bring out the important details. This application mainly uses the three techniques, i.e. Random forest, logistic regression, and K-nearest neighbors. Every model goes through a method that converts textual data to a machine learning-ready format with TF-IDF vectorization. These models are then used to classify resumes based on the categories of existing data sets. Each model is evaluated for correctness, and the final is presented as category distributions, confusion matrices, and bar graphs. This proposed approach excels at cockpit data visualizations with the merge of various models of machine learning making it plausible for a broader picture in the scenery of resume matching. The error- free, user-friendly visual feedback and intuitive user interface of the proposed system would set a reliable pre-screening tool for the recruiters. The proposed system represents a new and innovative approach to contractually integrating text preprocessing, visual analysis, and model diversity in the context of these problems.

Keywords: Resume comparison, spaCy , Streamlit application, machine learning models, K-Nearest Neighbors, Logistic Regression, Random Forest, text extraction, text preprocessing, TF-IDF vectorization, natural language processing, model accuracy, confusion matrix, category distribution, recruitment process, business intelligence, visual analytics, resumes, candidate screening.

I. INTRODUCTION

In today's tough competition in the job market, the great gold mine of recruiters is going through numbers of resumes to find the most suitable candidates. The traditional manual reviewing process is daunting, labor-intensive, biased, inconsistent, and tends to miss out qualified candidates. The further increase in number and complexity of resumes necessitates demand for innovative solutions that enhance recruiting efficiency and effectiveness.

To overcome these difficulties, a smart resume matching app is developed using Streamlit and advanced machine learning techniques. At the same time, the company claims to have a grand sense of how great it will change the business landscape regarding resume screening, and it streamlines the candidate evaluation process for recruiters using its tool instead of a wild and cold Resume screening. NLP capabilities filter out irrelevant ones, while the system intelligently analyzes various resume formats to extract the accurate information..

Resume only needs to be pre-processed and analyzed efficiently. The system cleans and prepares text by focusing on important elements like skills, experience, education, this using spaCy and other libraries. The sorting is done with such precision that the key info gets highlighted that helps recruiters in making an informed decision without any concern of exposure due to manual sorting. And therefore, the goal of this project is to keep on changing the hiring dynamics through a ML project, in order to minimize the amount of time and effort by Human Resources for the first round of evaluation of the application. Not only that, the application promises better and uniform evaluation of resumes, thus, making the recruitment journey more transparent and giving deserving candidates a fair chance to shine in this competitive environment.

II. LITERATURE REVIEW

Technology has been integrated into hiring processes, and Transformed the process of attracting and selecting candidates. This shift is explored by Chapman and Webster [1] and the role of packet netting platforms and applicant tracking systems (ATS). Their research shows that such technologies enhance the pre-screening and selection process, candidate

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Face Recognition Using MTCNN and FACENET and Classification Using SVM Classifier

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Abstract. Face recognition (FR) is a captivating and dynamic area of study within the discipline of computer vision, with significant implications for real-time applications. Despite persistent research efforts, the field of face recognition remains in a continuous state of development. Recent advancements have demonstrated promising results but have also introduced notable challenges. These challenges arise from diverse factors, including variations in face orientations, fluctuating degrees of illumination, blurred features, and the complexities introduced by facial alterations through surgical procedures. Employing sophisticated face detection and recognition techniques, the technology can effectively and accurately identify individuals from collected facial images or video footage. This work seeks to provide an exhaustive analysis of the body of existing research on face detection and identification, highlighting their weaknesses and proposing a solid model to address them. We aim to build a sophisticated face recognition system that can overcome current challenges and improve accuracy by comprehending the state-of-the-art approaches and examining their strengths and drawbacks. The proposed model delivered outstanding performance indicators, such as a precision 95.65%, recall 94.12%, an F-score 95.70%, and an accuracy 97.06%, respectively. By exploring the challenges encountered in uncontrolled environments, this study seeks to shed light on the factors impacting the system's efficacy. Moreover, it delves into existing methodologies and potential resolutions, envisioned to mitigate these challenges and bolster the overall efficiency of facial recognition systems.

Keywords: Facial recognition · Computer vision · classification · Intelligent systems

1 Introduction

The human face is increasingly important in modern methods of human authentication. In the field of biometrics, facial recognition is the security key. The steps in the face identification process that ultimately verify a person's identity are finding the face surface, correlating the detected face region, extracting the distinctive characteristics, and finally categorizing the face. Figure 1 depicts the full face recognition process.

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Design and Implementation of Theft Detection using YOLO based Object Detection Methodology and Gen AI for Enhanced Security Solutions

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Abstract : **This project introduces a intelligent theft detection system that utilizes the YOLOv8 (You Only Look Once v8) object detection model and generative AI along with real-time video surveillance and sound alarm functionality. The system constantly monitors video streams, identifies human occupancy in fenced or out-ofbounds zones, and sends immediate alerts, improving security and quick response. YOLOv8's advanced realtime processing abilities guarantee high-speed and accurate detection without sacrificing efficiency and thereby are the most suited for uses like survey line monitoring and surveillance. While in contrast to more conventional models like Faster R-CNN and SSD, which tend to sacrifice speed for accuracy or accuracy for speed, YOLOv8 manages to achieve the best of both. The system is implemented on the Streamlit platform, which offers an easy-to-use interface through which users can upload video files, modify confidence thresholds, and observe annotated results in real time. An in-built audio alert system implemented with Pygame also increases real-time responsiveness by alerting users to potential security threats. Through the integration of cutting-edge object detection with user-friendly and interactive experience, the solution provides a very effective and pragmatic solution for preventing theft with timely intervention as well as a security risk minimization. In addition, the system can be customized for multiple security purposes such as industrial monitoring, retail loss protection, and perimeter protection. Its efficiency and scalability provide it a solid solution for both large-scale and small-scale monitoring systems.**

Keywords: Theft detection, YOLOv8, real-time surveillance, Gen AI, object detection, video monitoring, audio alerts, security systems, live object detection.

I. INTRODUCTION

The project has offered an innovative system of intelligent theft detection, made possible using the strength of YOLOv8, the latest in object detection algorithms, combined with live video surveillance and augmented through Gen AI features. [1] The most interesting aspect of the system here is to be watching out for the video feeds, especially around area restrictions, to identify theft intentions by indicating the presence of people. In case of any suspicious finding of a person, a sound alert triggers at the moment itself, which helps the security agents to take action on time. [2] for high-speed surveillance in secure environments, such as survey lines or CCTV cameras, proper solution for speed and accuracy One of the key features of the system is that it uses Streamlit, which provides an engaging and user- friendly interface. [3] This app allows to upload video files right into the app, set confidence thresholds for detection, and watch annotated frames displaying the detected object in real time. Such level of personalization ensures that users can fine-tune the system according to their exact needs, whether that means configuring the level of sensitivity at which detections are made or how results [4] While other object detection models, including Faster R-CNN (Region Based Convolutional Neural Network) and SSD (Single Shot

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Harnessing Advanced AI Techniques for Code Generation: Transforming Software Development with Intelligent Automation and Predictive Algorithms

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Abstract— **The quick expansion of software development necessitates effective tools for automating monotonous coding jobs, yet existing solutions frequently fall short in producing accurate codes from natural language explanations, resulting in a disconnect between machine execution and human intent. This project uses cutting-edge AI methods to generate Python code automatically in order to overcome this difficulty. A dataset of Python scripts is used to train the model of a transformer with a vanilla encoder-decoder architecture. To improve the model's comprehension of natural language inputs, the data is preprocessed using a variety of embedding approaches. The model can accurately translate descriptions of English text into Python code. Software development is revolutionized by machine learning and predictive algorithms when the model that has been trained is then made available through a streamlit UI, which allows for real-time, user friendly engagements for code production based on English language inputs. The goal of this effort is to create an AI-powered system that uses a transformer-based vanilla encoder-decoder paradigm to accurately translate descriptions from natural English into Python code. Through the use of predictive algorithms and sophisticated embedding techniques, the system seeks to increase software development automation, increasing productivity and decreasing the amount of manual coding required.**

Keywords— Automation, Code Generation, Deep Learning, Embeddings, Encoder-Decoder, Natural Language Processing, Python and Transformer Model.

I. INTRODUCTION

The need for automated instruments that can help generate software from natural language data has grown as software development has become more advanced. Although developers frequently use manual coding, this approach may be laborious and error-prone, particularly when converting complex human needs into executable code [1]. The gap between accurate code outputs and human-readable descriptions cannot be adequately bridged by current code generating technologies. By creating an AI-powered solution that can convert natural language commands into Python code, this project seeks to solve the issue by expediting development and minimizing manual involvement. A 2023 poll by Stack Overflow [2] found that engineers devote about 40% of their spare time on troubleshooting and repetitive coding chores. Despite being necessary, these activities take up a lot of a developer's a period of time which may be better used for creativity and problem-solving. Furthermore, according to Gartner, over 70% of big businesses [3] will use some kind of low-code or no-code programming platform by 2025 in order to automate these repetitive operations.

With OpenAI's Codex serving as a shining example of AI models producing code from plain English, the use of AI in code production has significantly increased. A McKinsey analysis [4] from 2022 found that these technologies can save development time by as much as 50%. By 2025, the Indian IT sector [5] is anticipated to bring in $194 billion, with a significant emphasis on automation and artificial intelligence (AI). India's growing tech workforce can fulfill the growing demand for scalable, dependable, and quick software solutions by implementing AI in the creation of programs, particularly through robotics and predictive algorithms. The vanilla transformer structure [6] is the best option for converting natural language into code as it has been shown to be effective at handling sequence-to-sequence problems. Lastly, a user-friendly interface created with streamlit is used to deploy the learned model. Users may enter English text into the interface [7], and the model will process it to produce Python code that corresponds to it.

II. LITERATURE SURVEY

The topic of AI-driven code production has advanced significantly in recent years, especially with the introduction of models for natural language processing that are able to comprehend and produce code. The rule-based methods used in early code generation techniques needed a great deal of human programming to create mappings between programming structures and plain language inputs. Due to their heavy reliance on preset rules and templates, these systems lacked adaptability and flexibility [8]. Becker et al. while addressing potential obstacles, the study highlights how critical it is for computing education to move quickly in order to take advantage of the quick development of AI-driven code creation tools [9]. By identifying patterns in big datasets of programming jobs, these models [10] made it possible to automatically translate plain language into code. Yetistiren et al. in this study, the code quality metrics of OpenAI's ChatGPT, Amazon Code-Whisperer, and GitHub

Machine Learning Analysis of Free Convection Flow through a Porous Medium in a Third-Grade Vertical Channel: A Comprehensive Exploration

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Abstract: ***The analysis of fully developed unfixed convection in a vertical channel with a third-grade fluid and porous medium involves solving complex non-linear equations for speed and temperature fields. To augment this process, machine learning techniques offer valuable contributions. Machine learning algorithms facilitate the creation of predictive models, extracting insights from extensive data, optimizing parameters for efficiency, and conducting sensitivity analyses to understand system responses. Furthermore, these algorithms aid in reducing computational costs through surrogate models and metamodels, recognizing intricate patterns, and enabling real-time monitoring and control for adaptive strategies. By integrating machine learning, the study benefits from enhanced prediction accuracy, data-driven decision-making, and a deeper comprehension of the intricate dynamics governing fluid flow and temperature distribution in the vertical channel.***

Keywords: metamodels, Convection, Machine learning, Predictive models, Sensitivity analyses, Fluid flow

I. INTRODUCTION:

Free convection flow through porous media holds significant importance in various engineering applications, particularly in the context of heat transfer processes. The third-grade vertical channel, characterized by its non-Newtonian behavior, presents a challenging yet intriguing scenario for studying convective heat transfer. The interaction between the fluid flow and the porous structure adds layers of complexity to the convective phenomena, necessitating advanced analytical tools for a comprehensive understanding [1].

Traditional approaches in fluid dynamics have provided valuable insights into convection flows; however, the intricate nature of the third-grade vertical channel requires a more nuanced and predictive analysis[2]. Recent years saw machine learning emerge, modeling complex systems and predicting intricate patterns. This study integrates machine learning to bridge conventional and intricate fluid dynamics in free convection through a porous medium [3].

The integration of machine learning methodologies enables us to explore and predict the complex interactions within the porous medium, offering a more holistic perspective on the convective heat transfer process [4]. Research contributes to knowledge by deepening understanding of mechanisms governing free convection in porous media, emphasizing third-grade vertical channels [5]. The insights gained from this study hold the potential to inform and optimize the design of systems involving porous media, facilitating advancements in various engineering applications such as geothermal energy extraction, environmental remediation, and thermal management systems [6].

Furthermore, the utilization of machine learning in this context is motivated by the need for more accurate and efficient predictive models [7]. Traditional analytical methods often face challenges in capturing the intricate and non-linear relationships inherent in porous media flows. Machine learning algorithms, being data-driven and capable of adapting to complex patterns, offer a promising avenue to address these challenges [8].

The third-grade vertical channel, characterized by the non-Newtonian behavior of the fluid, introduces additional complexities that necessitate a sophisticated approach [9]. The viscosity variation in non-Newtonian

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AI-Enhanced Analysis of Unsteady Convection in Copper-Water Nanofluid Flow over a Vertically Moving Porous Plate

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Abstract: ***The dynamic behaviour of unsteady convection in a copper-water nanofluid, wherein a vertically moving porous plate serves as the medium for heat transfer. The study leverages artificial intelligence (AI) techniques to enhance the understanding of the complex fluid dynamics and thermal characteristics involved in this scenario. The application of AI algorithms facilitates a comprehensive analysis of the nanofluid's behavior, allowing for more accurate predictions and insights into the heat transfer processes. The results contribute to the advancement of both nanofluid dynamics and AI applications in fluid mechanics, offering valuable information for engineering and technological advancements. This study examines MHD convective flow over a perpendicular porous plate using Laplace transforms. Analytical evaluation and computational discussion of temperature, velocity, Nusselt number, and shear stress reveal engineering tool applications. Velocity rises with permeability, and stress elevates with magnetic parameters.***

Keywords: Free convection, MHD flows, nanofluid, porous medium, Laplace method

I. INTRODUCTION:

In fluid dynamics and heat transfer, studying nanofluid convection reveals unique challenges and technological opportunities. This research investigates unsteady convection in copper-water nanofluid, focusing on its interaction with a vertically moving porous plate. Nanofluids, with enhanced thermal properties, are crucial for industry. Integrating artificial intelligence (AI) into the study enhances the analysis of complex systems, addressing real-world complexities[1]. By unraveling fluid flow, heat transfer, and nanoparticle dispersion, this research contributes to scientific understanding and offers potential for optimizing heat transfer in practical applications. The study aligns with the demand for sustainable heat transfer systems in emerging technologies[2]. The combination of nanofluid properties and AI capabilities positions this research at the forefront of innovative approaches to contemporary challenges in heat transfer engineering. The investigation of unsteady convection introduces temporal complexities[3], demanding a nuanced understanding for effective system design and optimization [4].

II. THE FORMULATION OF THE ISSUE AS WELL AS THE PROPOSED SOLUTION:

This study addresses MHD convective flow over a perpendicular porous plate[5][6], investigating the impact of permeability and magnetic parameters on velocity and stress[7]. The fundamental issue is understanding these dynamic interactions for engineering applications [8]. To solve this, Laplace transforms are employed for analytical evaluation [9].

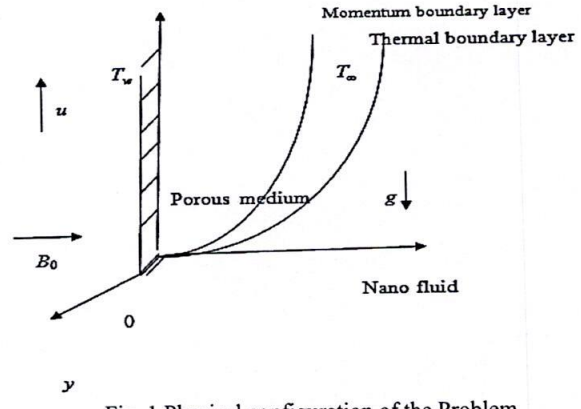

Fig. 1 Physical configuration of the Problem

The study [10] proposes a comprehensive examination of temperature, velocity, Nusselt number, and shear stress[11]. The findings reveal that as the permeability parameter increases,

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Revolutionizing E-Commerce Customer Support: Advanced AI-Powered Chatbots for Enhanced User Experience & Operational Efficiency

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***Abstract*— The research presents a new approach i.e. an artificial intelligence (AI) driven customer care model to improve consumer service facilities for e-commerce platforms. At its heart, it is a very advanced chatterbot which is meant to guarantee a seamless communication of the users with the website. For example, it employs techniques like cosine similarity and TF-IDF Vectorizer based natural language processing, to retrieve product information from a large phalanx database to accurately answer the user query processing (NLP) methods. The chatbot uses complex text processing methods such as tokenization, preprocessing, keyword matching, and the Bag of Words model to understand the user's input and generate a response. This type of access allows product information to be timely, relevant, usable in a decreased friction world, and improve the overall experience for users. These NLP models address frequent problems encountered in providing customer support by streamlining responses and accelerating the information accessibility process that ultimately enhances user experience and interaction with the service. The study underpins further developments of smart support systems by demonstrating how AI-driven solutions can transform customer care within the e-commerce space.**

Keywords*— *AI-powered, Chatterbot, Cosine similarity, Ecommerce, Keyword matching, Natural language processing (NLP), TF-IDF Vectorizer and Text processing.

I. INTRODUCTION

In the such dynamic-setting of e-commerce, efficacious customer support has emerged as a prerequisite for customer satisfaction and retention [1]. The traditional method of handling customers is to perform manual queries, that is erratic and labour intensive. The recent developments in natural language processing (NLP) provide innovative solutions for these challenges. With the introduction of tools like cosine similarity and TF-IDF Vectorizer, NLP models can significantly enhance the efficacy and productivity foundations of communications with customers. While cosine similarity measures how closely related user searches are to product descriptions, TF-IDF Vectorizer helps identify important words or phrases [2] within those product descriptions. These two methods work harmoniously. Following the progress it will be possible to design conversational agents that will answer questions of consumers much better. Like for example, by having chatbots who can handle up to 80% of the standard inquiries it would create time for human agents to work on more complicated issues. Another issue that has led to higher user satisfaction rates among customers is the fact that they get a quick and accurate response as AI is used in customer service.

Such a change would enhance the overall effectiveness of customer care operations while also offering customers a more integrated online purchasing experience. This paper focuses on developing a chatterbot for an online store [3] that aims to simplify product search and engagement. The chatterbot, through comprehensive text processing techniques like tokenization, preprocessing, and keyword matching, answers accurately and contextually. Thus, it simplifies obtaining and retrieving product data; simultaneously, user experience is enhanced. This approach addresses the need for advanced customer care solutions within the e-commerce industry. With increased shopping trends online, businesses face greater impetus to provide timely and effective customer service [4]. E-commerce platforms may enhance their service offerings, decrease response times, and boost customer happiness by using an AI-powered chatterbot.

II. LITERATURE SURVEY

A lot of work has already been done in the past to improve e-commerce customer service by creating intelligent systems. Earlier methods concentrated on rule-based chatbots, which reacted to particular keywords and followed prewritten scripts. Baabdullah et al study looks at the variables affecting users' virtual interactions with chatbots driven by artificial intelligence. 500 consumers of express mail, package delivery, and courier services [5] participated in an online poll that yielded data. The findings demonstrated the major influence of readability, transparency, customization, responsiveness, and ubiquitous connection on the quality and enjoyment of communication. The study recommends taking

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Intelligence Pest Detection and Control in Agriculture using Computer Vision and Deep Learning

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Abstract : ***One of the most significant challenges in agriculture over the years has been the detection and also control of pests and while it continues to this day, the advent of technology in the agricultural sector is providing solutions that are incredibly promising. Pests cause significant worldwide crop loss and represent a threat to food security and farmer livelihoods. Conventional pest management approaches revolve around labour-intensive strategies, large applications of pesticides, and reactionary measures, resulting in environmental degradation and sub-optimal crop yields. This work utilizes the power of AI(Artificial Intelligence),computer vision and deep learning to create a smart pest detection system. It treats pest identification and damage detection as real-time visual data processing tasks with machine learning approaches, making it possible to swiftly and accurately locate pests and their damage in the photos taken through the camera, facilitating extra prompt preventive measures. Working under the hood, the algorithms adapt to changing environmental conditions and shifting pest behaviours, learning as they go. Most of the pest detection systems today are manual, requiring manual visual inspection and image recognition approaches, this solution not only provides the next level of system but it also paves the way for pest management in the most efficient, accurate & sustainable way.***

Keywords : **Pest Detection, Agriculture, Computer Vision, Deep Learning, Convolutional Neural Network, Machine Learning Models, Real-Time Monitoring, Scalable Cloud Architecture, Pest Control, Sustainable Farming, Data Security, Image Processing, Crop Health.**

I. INTRODUCTION

To meet global food demands, innovative and performant pest control measures need to be established. The advancements in AI and deep learning have created the capability of highly accurate and fast pest detection. In order to cater to the increasing global demand for food, novel and efficient pest control methods should be developed. With recent progress in AI and deep learning, accurate and rapid pest identification is now a possibility. A pest detection AI, powered with computer-vision, is able to process huge amounts of image data and detect pests with high precision. The integration of drones with high-resolution cameras and complex algorithms allow farmers to view crops at scale, that lets them detect pests earlier and reduce economic and environmental costs. The use of AI and deep learning in agriculture has its problems too: data noise, conditions in the environment, and less enthusiasm for modern technology among some of the more traditional farmers. Despite these issues, possible beneficial effects are orders of magnitude greater. The aim of this work is to develop an improved pest detection as well as monitoring system via image processing and deep learning methods. By utilizing large-scale datasets with analytical algorithms, the system will enable accurate pest tracking and predictions intermediately throughout specific cropping environments. It improves efficiency and accuracy, helps to spend fewer pesticides and less money, and preserves biodiversity. The early detection of pests is essential for contemporary farming, with the potential for crop losses a serious issue in food security. Pest infestations threaten productivity in agriculture today. Conventional detection systems are inefficient due to the manual methodology and response time taken. The illustrate the gaps of regular methods used in detection and the role of modern technologies like computer vision and deep learning for rapid and precise detection of pests. Furthermore, it will explain how smart pest detection systems facilitate accuracy, reduce dependency on pesticides, and foster environmentally sustainable farming practices while addressing contemporary agricultural issues in an efficient manner.

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Traffic-Flow Predictor: Predicting Traffic Volume and Patterns

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Abstract— **The estimation of traffic volume is an important part of urban transport management, and it is a necessary step for resource allocation and traffic flow optimization. In this study, we evaluate the performance of various different regression models of the relationship between traffic volume and a diverse collection of variables (e.g., temperature, precipitation (both snow and rain), weather, holiday status, and several temporal features such as year, month, day, hour, minute, and second). The paper utilizes a rich dataset of historical traffic volumes, combined with related environmental and temporal data. Missing values are handled and features standardized according to strict preprocessing methods. Linear Regression, Decision Tree Regression, Random Forest Regression, XGB-regression, & Support Vector Machine (SVM) regression are the regression models considered. Performance evaluation through metrics such as mean absolute error, mean squared error, and R-squared to validate the models for generalization and accuracy. Although the Random Forest Regressor and XGB-Regressor both receive fantastic R-squared values 97 and 90 respectively, suggesting mostly great predictive performance, the Decision Tree Regressor has an impressive R-squared score of 1.0, meaning it perfectly spaced the training data.**

Keywords— Environmental Attributes, Prediction Models, Regression Analysis, Traffic Management, Traffic Volume, Temporal Factors, Urban Planning and Vehicle Flow.

I. INTRODUCTION

Traffic volumes are an important part of urban transportation management; it refers to the number of cars on the road, which can be predicted by various factors. Regression analysis is a statistical method for modeling and analyzing the relationship between a dependent variable (traffic volume) and one or more independent variables (temperature, time of day, special events). This approach is the basis of the theory underlying this work. They rely on regression models [1] to capture the relationship between traffic patterns and volumes, which is critical for accurate traffic estimation. Various regression techniques enable distinct advantages for modeling these relationships and provide useful insights on traffic flow characteristics. In modern society, the accurate traffic volume prediction [2] has significant implications for transportation management and urban planning. In order to ensure that the ever increasing urbanization and traffic does not cause significant levels of traffic congestion and subsequently increase travel time and reduce road safety, efficient traffic management systems are necessary. Advanced predictive models can help cities plan infrastructure upgrades, improve traffic signals, and more effectively distribute resources [3]. The accurate forecasting of traffic, for instance, can have far-reaching implications in the design of optimal traffic control strategies, the planning of road maintenance, and road utilization and intelligent transportation systems, leading to the formation of sustainable cities and improved quality of life.

The study seeks to explore an extensive dataset that includes historical traffic volumes along with environmental and temporal characteristics, to identify the most reliable and successful traffic prediction model [4]. Standard pre-trained models [5] are tested for their ability to deal with various pieces of data and for accurate predictions in order to make informed decisions with respect to traffic management. The conclusions of the study offer a comparative review of multiple regression techniques makes the traffic management domain better as a whole.

II. LITERATURE SURVEY

Previous research on traffic volume prediction has primarily focused on forecasting vehicle flow based on historical and current data using a variety of statistical, as well as machine learning, methods. The early research has then modeled traffic patterns using commonly available statistical methods such as time series analysis and linear regression. These approaches were limited in that they were incapable of fully capturing complex interactions among multiple factors, such as weather and special events, and often relied heavily on historical traffic data [6]. While simple, these models formed the basis for more elaborate approaches and provided essential information for traffic volume prediction. Kim et al. study suggests a multifaceted pattern recognition approach [7], which combines artificial neural network and Gaussian mixture model clustering, to forecast urban traffic flow. Lv et al. suggests a unique deep learning-based technique [8] for predicting traffic flow that takes temporal and geographical correlations into account.

Chang et al. to solve inefficient estimates in intelligent transportation systems (ITS), this work presents [10] an evolving multi-interval traffic volume forecasting framework based on k-nearest neighbor not parametric regression (KNN-NPR). In order to minimize prediction errors and capture future state directionality, the input to the model parameters were tuned for real-world data. Habtemichael et al. provides an updated K-nearest neighbor (K-NN) algorithm-based non-parametric data-driven strategy for short-term traffic forecasting.

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Advanced Image Generation using Generative Adversarial Networks (GANs): Innovations in Creating High-Quality Synthetic Images with AI

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***Abstract*— This research analysis reviews the latest developments in advanced Generative Adversarial Networks (GANs) picture synthesis with focus on enhancements aimed to create high-quality synthetic images. The goal of this work is to expand the limits of image generation and quality by using the capacity of GANs, particularly by performing basic functions such as Input, Conv2D, Dense, Flatten, and Dropout. This study consists of creating and improving a GAN model capable of generating realistic and elaborate graphics in different areas. If the high level results were encouraging, the results were even better once a Flask based user interface is added. This user interface allows for the generation and real-time visualization of artificial images, thus providing a useful environment to test and evaluate the effectiveness of the GAN model. The findings of this study contribute to the field of artificial intelligence applications by offering a robust approach to generating images that can be utilized for diverse applications, such as data augmentation, simulations, and entertainment. This paper lays out the methods employed, challenges embraced, and success achieved indicating the capacity of GANs to raise picture synthesis to the next level.**

Keywords*— *Adversarial Networks, Flask, GANs, Image Generation, Model Optimization, Synthetic Images, User Interface and Deep Learning

I. INTRODUCTION

Generative Adversarial Networks (GANs) have helped boost machine learning development, particularly in the field of image generation [1]. A GAN consists of two neural networks, the discriminator and the generator, that are trained simultaneously through opposing processes. The discriminator determines if the generator's synthetic images are real. Due to the competitive process this entails, GANs can yield extraordinarily realistic images, often surpassing traditional algorithms. The basic GAN operations of input, conv2D, dense, flatten and dropout are critical in improving a networks performance in generating high quality images by simply reducing the learning process and limiting the ability to overfit. Generative Adversarial Networks (GANs) are applied in many fields of modern culture, including data augmentation [2], entertainment, and the arts.

They also offer solutions to problems such as data augmentation, where additional training data in the form of synthetic images can improve the performance of machine learning models. This technology creates more immersive and engaging experiences, and could revolutionize the creative industries while also enhancing the realism of digital modelling. The significance of GANs in the AI domain is evident from the growing popularity of GANs [3]. Integrating a Flask-based user interface allows users to interact with the model and see the model results in real-time, which, therefore, makes practical implementations even smoother. The report details the design of GANs that output high-fidelity images and the methods, performance metrics [4], and all aspects useful to the user concerning the GAN model.

II. LITERATURE SURVEY

In the past, there has been a significant development in the study and application of Generative Adversarial Networks (GANs) for image generation. Early studies focusing on improving the basic GAN structure intent to achieve higher detail levels to make realistic images. It was laid by early models like the first GANs, where adversarial training was proposed, where the generator and discriminator (two neural networks [5]) 'competed' to create and evaluate fake images More complicated structures, such Deep Convolutional GANs

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Navigating the E-Learning Landscape: A Systematic Evaluation of Website Performance Using the Weighted Sum Method

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Abstract. In today's rapidly changing digital environment, e-learning has emerged as a revolutionary tool in education and training, granting learners unprecedented access to abundant educational materials. However, amidst the multitude of e-learning platforms available, it is crucial to evaluate and assess their effectiveness, user-friendliness, and overall quality to ensure the delivery of engaging and efficient learning experiences. This research utilizes the Weighted Sum Method (WSM), a widely recognized Multi-Criteria Decision-Making (MCDM) technique, to thoroughly assess and compare the performance of various e-learning websites (ELWs). The assessment criteria encompass five essential dimensions: usability, reliability, portability, personalization, and learning community. By assigning weights to these criteria, the WSM facilitates a methodical and equitable evaluation of the trade-offs and synergies between different factors, leading to more informed decision-making. The analysis identifies ELW6 as the top-performing platform, achieving the highest preference score and securing the first rank among the evaluated ELWs. This distinction indicates that ELW6 exhibits comprehensive and superior performance, excelling in areas such as intuitive interface design, robust technological infrastructure, seamless cross-device compatibility, personalized learning experiences, and fostering a vibrant online learning community. Closely trailing ELW6, ELW4 earns the second rank, showcasing its own strengths, particularly in reliability and portability. ELW3, ranked third, demonstrates a more balanced performance across the criteria. However, ELW2 and ELW5, ranked fourth and fifth respectively, exhibit commendable performance in specific aspects but fall short of surpassing higher-ranked platforms in the overall evaluation. The findings from this study can guide decision-makers, instructional designers, and e-learning platform developers in enhancing existing ELWs or developing new, impactful online learning solutions. By understanding the critical factors contributing to e-learning website success, stakeholders can make informed decisions, refine design and development processes, and improve the overall quality and efficacy of e-learning experiences for learners.

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Detection of Deep Vein Thrombosis Using Machine Learning for CT Images

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Abstract. This paper's primary goal is to provide an overview of Deep Vein Thrombosis (DVT) and its contributing factors. There is currently no clinical diagnostic for the DVT, despite it being the largest cause of disease and mortality in the globe. DVT refers to the development of blood clots in deep veins. Afflicted deep leg veins are frequently the femoral vein, popliteal vein, calf veins, or pelvic deep veins. If left untreated, it's a potentially dangerous illness that could result in morbidity and even death. D dimer, a common laboratory screening assay, has high sensitivities but low specificities, making clinical identification of DVT difficult. More precise and noninvasive diagnostic methods are needed in order to effectively localize, monitor, and diagnose DVT in patients during and after therapy. Imaging methods are often utilized in conventional clinical therapy because they may quickly discover and identify the DVT. Due to its non-invasive nature, impedance plethysmography technology could be utilized to produce a portable DVT diagnosis equipment. On the other hand, the IP signal is susceptible to motion artifacts. Therefore, it is crucial to create MA reduction methods that are tailored to the IP signal. It can also get rid of motion with a large amplitude.

Keywords: Dimer test · blood clotting · impedance plethysmography · deep vein thrombosis

1 Introduction

Intraluminal clotting is one of the most serious problems associated with peripheral vein disorders. The term "thrombosis" describes the formation of an abnormal tumour inside a living thing's circulatory system from blood components. When it affects deep veins, the illness is known as deep vein thrombosis (DVT). The DVT is a pulmonary embolism-related blood clot in a deep vein. For long-term prevention of post-phlebitis syndrome and pulmonary hypertension as well as the potentially fatal acute pulmonary embolism (PE) consequence, accurate detection of DVT is essential. Clinical diagnosis of DVT is challenging. There are approximately 0.1% of those affected each year. There are several methods to diagnosis the DVT. Figure 1 shows the flow chart of the DVT.

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Applications and Advancements of Nanoparticle-based Drug Delivery in Lung Cancer Treatment

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***Abstract*—In the recent decade, cancer nanomedicine has revolutionized cancer detection, diagnosis, and treatment via nanotechnology. The National Institutes of Health defines nanoparticle as any substance that reduces a medicine's size to 1 micron. Nanoparticle-based therapy systems' ability to carry hydrophobic medications, specifically target ill areas, and overcome biological barriers has garnered attention. The framework provided in this proposed includes data preparation, feature selection, and model training. When ready for usage, data is cleaned, normalized, and missing data filled. To optimize model learning, feature selection is done before training. Fuzzy RBF-CNNs integrate convolutional neural networks, fuzzy clustering, and radial basis function neural networks to train the model. With an average accuracy of 94.26%, the Fuzzy RBF-CNN model outperformed CNN and SVM models. The framework's feature selection and learning efficiency improvements improve prediction results. Compared to CNN and SVM, Fuzzy RBF-CNN performs better. The hybrid nature of the model makes cancer nanomedicine applications strong and accurate, which could improve treatment efficiency and precision.**

Keywords*—nanoparticle-based drug delivery, lung cancer, radial basis function (RBF).

I. Introduction

No matter where you are in the world, cancer is remaining a major threat to human health. With the use of organ and tissue origin classifications, more than a hundred different forms of cancer can be identified. The most deadly of these diseases is lung cancer, which has numerous origins but is primarily brought on by smoking cigarettes for an extended period of time. It has been found that men and women are exposed to the same amounts of smoking, both directly and indirectly. The yearly death toll from lung cancer is much higher than that from other cancers, including breast, colorectal, and prostate cancers. The incidence rate is increasing dramatically in developing countries, where local populations account for almost 50.1% of lung cancer cases[1]. An increase in the number of persons affected by respiratory diseases has been attributed to a number of key factors, including smoking, fast urbanization, environmental pollution, and rapid development. Despite being the second most prevalent malignancy in both sexes and the main cause of cancer-related deaths globally, the small cell lung cancer (SCLC) subtype only makes up 14% to 16% of all lung cancer diagnoses. There are two main types of lung cancer: SCLC and non-small cell (NSCLC). Despite NSCLC's better survival rate, SCLC is less common[2]. An aggressive undifferentiated neoplasm, SCLC originates from neuroendocrine cell progenitors. Characteristics of this disease include quick cell proliferation and early metastasis. It develops resistance to standard treatments early on, but displays early progress and lack of sensitivity to further pharmacological treatment, even though it is extremely susceptible to cytotoxic therapy and ionizing radiation. The study of tumors and patients with NSCLC has advanced molecular characterization of the disease. As a result, scientists have been able to identify oncogenic drivers in genes that are critical for cell survival and proliferation; these drivers activate signaling proteins in an abnormal manner, leading to the uncontrolled growth of lung cancer cells.

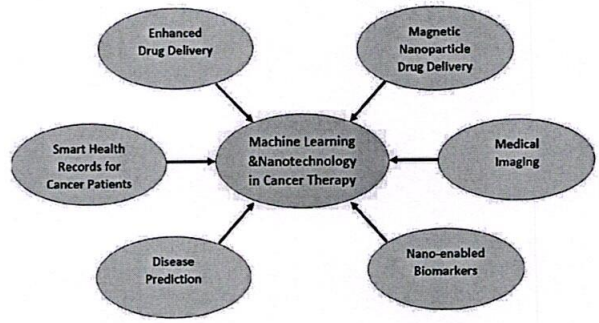

Fig. 1. ML & Nanotechnology in Cancer Therapy

Figure 1 shows the wide variety of metallodrugs that have been developed using this adaptable method outperform their solely organic counterparts in terms of action mechanisms and functionality[3]. As a promising development in improved cancer treatment, anticancer nanomedicines are already reducing their related adverse effects. To improve patient prognosis and quality of life in the fight against cancer, it is crucial to continue researching and collaborating across multidisciplinary domains to build nano-based cancer treatments. To better identify and treat lung cancer at an early stage, it is essential to understand the processes that contribute to the disease. In this era of personalized medicine, this includes discovering new therapeutic targets and creating more accurate and precise biomarkers. Genomic, epigenomic, functional, transcriptome, proteome, and metabolomics

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Chapter 20
Foreign Object Debris Detection Using YOLOv5

Puttapaka Varshitha, Kachi Anvesh, N. Sai Yashwanth, Y. Varun Prasad, and A. Ramesh Babu

Abstract This research describes a technique for detecting the foreign object debris (FOD). foreign object debris (FOD) constitutes a significant and pressing challenge within the aviation industry, presenting a formidable threat to the safety of aviation operations. For ensuring the safety and cleanliness of airport runways is paramount for smooth aviation operations. Detecting and removing foreign object debris (FOD), especially the tiny and hard-to-spot varieties, is vital. An effective system capable of accurately identifying and swiftly removing FOD is necessary for the efficient maintenance of runway safety. There are different types of technologies available to detect foreign object debris. The most efficient method for detecting foreign object debris is millimeter-wave radar technology and it is resistant to weather. Additionally, millimeter-wave radar offers an affordable way to find (FOD) at a frequency of 96 GHz in less than 10 s while integrating with radio over fiber technology. To put it simply, the study emphasizes the necessity for a trustworthy method for identifying various FOD objects.

20.1 Introduction

According to estimates made by the International Air Transport Association (IATA), current advancements in air travel could quadruple the number of travelers to 8.2 billion by 2037 [1]. Between 2005 and 2025, there is an expected increase in aircraft departures of 3.6–4.1% each year, on average, from a total of 24.9 million aircraft departure and 30.8 billion aircraft-kilometers flown in 2005 [2]. Because air traffic is increasing at an exponential rate, aviation is gravely concerned about air transport mishaps. There were 50 fatalities from aircraft accidents in 2017 and 514 fatalities from them in 2018 [3]. One of three highly hazardous accident types in the ICAO Global Flight Safety Plan includes scheduled commercial aviation traffic and security events on runways, according to the International Civil Aviation Organization

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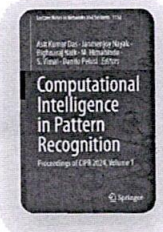

Computational Intelligence in Pattern Recognition

(CIPR 2024)

M. Sivapratap Reddy & P. Phanindra Kumar Reddy

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Abstract

2024 4th International Conference on Mobile Networks and Wireless Communications (ICMNWC)

Predicting Crops based on Soil and Environmental Characteristics using ARIMA and LSTM Model

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***Abstract*—Food producers are under pressure to meet rising demand as the world's population and natural resources diminish. Overuse of pesticides and fertilizers has caused soil erosion and land degradation. Future food needs will require environmentally sustainable farming strategies.The suggested strategy includes model training, feature extraction, sensor integration, and model preparation. Data preparation involves processing data before storing it machine-readable. SFFS and RFE select features. The model was trained using a hybrid ARIMA-LSTM technique, which blends deep learning and time-series forecasting.The ARIMA-LSTM model outperforms solo ARIMA and LSTM models with an average accuracy of 93.54%. Increased accuracy shows the model's capacity to anticipate sustainable agriculture approaches.Data-driven and environmentally sustainable ways are needed to overcome global food production concerns, according to this study. When paired with good preprocessing and feature selection, ARIMA-LSTM can boost agricultural productivity while minimizing environmental impact.**

***Keywords*—long short-term memory (lstm), crop productivity, soil management.**

I. Introduction

A nation's food production capacity is a measure of its social and economic development. The production of food staples has long been linked with farming. The proposed systems live in a world where the pace of population expansion has always been the primary worry of our civilization. Particularly in terms of land use and fertility, this has drastically diminished agricultural potential. As a result of fast urbanization and globalization, there is little hope for the expansion of arable land in our era. Consequently, farmers need to find ways to make the most of what the system have. An integral aspect of farming is the prediction of crop cultivars. Despite the availability of agricultural statistics, very little research has investigated crop prediction using historical data. Fertilizers with micronutrients, potassium, and nitrogen are applied uncontrollably, making crop cultivation prediction difficult[1]. Harvest yields can be affected by agro-climatic input parameters such as soil type, precipitation, and temperature. Aggregating input parameters for farming across enormous swaths of land is daunting and varies greatly between regions[2]. It is possible to use the gathered datasets for large-scale crop forecast.Because these problems are so complicated, new tools need to be developed.

Biologic factors are those in which one living thing influences another living thing in some way, whether directly or indirectly. Among these are parasites, plants, animals, predators, and pests. This group also includes anthropogenic factors, which include things like fertilization, pesticides, irrigation, and pollution of the air, water, and soil. These factors may contribute to a wide range of variations in agricultural output, such as anomalies within the crop, defects in its structure, and shifts in its chemical make-up[3]. The factors that impact the growth, development, and efficiency of ecosystems living and nonliving entities both have an impact on plant life.

The agricultural sector is vital to the national economy and the environment. Agriculture has taken on greater significance and necessity in today's world due to the worrisome rate of population growth. Raising agricultural output is necessary to attain a sustainable equilibrium[4][5]. How sustainable the agricultural production is depends on several factors, such as the environment, soil, water, and weather. The farmers' hard work paid off with the crop. The primary determinants of harvest yield are those associated with agriculture. Before planting and after sowing are the two most common ways that agricultural procedures are classified. As part of the pre-sowing procedure, the system should analyze the climate for the sowing time, test the soil for nutrients, formulate the soil texture, and choose crops based on the type of soil. Pest control, weed management, irrigation and fertilizer regulation, tool optimization, and timely harvesting make up the bulk of post-sowing crop management[6].

On top of that, the country's population boom has created a massive need for new agricultural kinds. As a result of farmers' poor crop selection decisions based on environmental factors, nation's demand is unmet. Concurrently, nation's economy takes a hit as their pay drops and their working conditions deteriorate. Consequently, the proposed systems have conducted the research in a manner that will not hinder agricultural productivity but will greatly satisfy farmers' expectations. The purpose of this research is to examine agricultural sustainability as a concept and the many soil and crop management methods (SCMS) developed to maximize crop output in environmentally sustainable settings.

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Optimizing Natural Language Understanding: A Comprehensive Study of Python's Top Libraries

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***Abstract*—** Competent human-computer communication relies heavily on the ability to master natural language, where a strong understanding of grammar and context is crucial. As conversational interactions move beyond traditional interfaces, the integration of speech and text into daily communication systems is becoming seamless. At the forefront of this transformation is Natural Language Processing (NLP), the field that enables machines to comprehend, interpret, and respond to human language in a meaningful way. This study explores the evolving landscape of NLP, with a particular emphasis on the Python ecosystem and its libraries, which are essential tools for advancing language comprehension and processing. Python, due to its versatility and robust community support, has become a cornerstone in the development of NLP applications. By comparing and analyzing these Python libraries, this research offers a detailed examination of their functionalities, performance, and adaptability to various NLP tasks.

Key Words: Artificial Intelligence, Machine Learning,* Natural Language Processing, *Python, Python Libraries.

INTRODUCTION

In the rapidly evolving landscape of artificial intelligence, one facet stands as a bridge between human cognition and machine intelligence: Natural Language Processing (NLP). This dynamic field aims to dissolve the barriers separating human language from computer comprehension, empowering machines to interpret and decipher text and speech akin to their human counterparts [1]. Yet, NLP goes beyond mere word recognition; it delves into the intricate fabric of sentences, phrases, and linguistic structures, capturing the nuances of syntax, semantics, and grammar that define human communication. With the alchemy of algorithms, NLP deconstructs language into intelligible components, laying the groundwork for NLP-based applications and systems that fuel our AI-driven world [2].

In recent years, the tapestry of NLP has been woven with threads of remarkable advancements, largely spurred by the advent of transfer learning and pre-trained language models. These breakthroughs have expanded the realm of language comprehension and generation, unfurling new dimensions of natural language interaction [3]. At the heart of these advances lies the transformative application of transformers and transfer learning techniques, infusing new life into downstream NLP tasks. With models like the Bidirectional Encoder Representation (BERT), GPT2, XLNet, and PaLM, the landscape of NLP is graced with powerful instruments fortified by empirical strength and elegant design [4]. These models stand as beacons of excellence, illuminating key NLP domains such as question-answering, named entity recognition, language understanding, reasoning, and even the art of language generation. The resonance of NLP extends its influence across the tapestry of industries, each thread weaving applications that span sentiment analysis and information extraction, and culminate in the development of conversational agents and language translators. NLP has breathed life into digital assistants such as Google Assistant and Alexa, weaving them seamlessly into our daily lives [5].

II. RELATED WORK

The realm of Natural Language Processing (NLP) has undergone a transformative journey over time, with a lineage of Python libraries that have significantly shaped its trajectory [6]. Among these, NLTK (Natural Language Toolkit) and Gensim stand as foundational pillars, laying the groundwork for the innovative landscape we encounter today [7]. NLTK,

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Integrated Deep Learning Methodology for Early Glaucoma Detection and Diagnosis using Retinal Fundus Images

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***Abstract*—This study proposes a thorough methodology for diagnosing glaucoma in retinal fundus pictures using modern image processing and deep learning techniques. The photos are resized using Nearest Neighbor Interpolation before being converted to grayscale, noise reduced with a Kalman Filter, and contrast enhanced with Dualistic Sub-Image Histogram Equalization. Scale-Invariant Feature Transform (SIFT) is used to extract features, which are then processed by VGS Net, a deep learning network developed exclusively for glaucoma diagnosis. The methodology has been confirmed by extensive performance analysis, with an accuracy of 99.06%, precision of 99.19%, recall of 98.13%, and an F1 score of 97.65%. These findings show that the proposed technique is both effective and reliable, making it a promising tool for detecting early glaucoma in clinical settings.**

Keywords*—Glaucoma detection, Retinal fundus images, Image preprocessing, Deep learning, Performance metrics.

I. INTRODUCTION

Glaucoma is one of the most common causes of irreversible blindness worldwide, impacting millions of people, primarily the elderly. The condition is distinguished by gradual degeneration of the optic nerve, which is frequently coupled with increased intraocular pressure and, if left undetected or untreated, results in permanent vision loss. Early identification of glaucoma is crucial, as prompt treatment can greatly decrease disease development and preserve vision. Traditional diagnostic approaches, which rely on professionals manually examining and interpreting retinal pictures, are typically subjective and variable, making the detection process time-consuming and sometimes unreliable. This has highlighted the need for more reliable, automated procedures that can assist clinicians in diagnosing glaucoma early on with high accuracy and consistency. In answer to this need, the present study provides a unique, automated method for detecting glaucoma using retinal fundus pictures that combines modern image processing techniques with deep learning algorithms. The methodology begins with the preprocessing of retinal images, which includes procedures like as resizing, grayscale conversion, and noise reduction using a Kalman Filter to ensure that the images are of sufficient quality for analysis. Dualistic Sub-Image Histogram Equalization improves image contrast and enables for improved visibility of crucial features. The Scale-Invariant Feature Transform (SIFT) is then used to extract important features that are independent of scale and rotation, resulting in robust inputs for the deep learning model. The collected features are examined using VGS Net, a deep learning network created exclusively for glaucoma detection. The efficiency of this approach is proved by thorough performance evaluation, which yields excellent metrics like as 99.06% accuracy, 99.19% precision, 98.13% recall, and a 97.65% F1 Score. These findings indicate that the suggested methodology provides a very reliable tool for early detection of glaucoma, potentially improving diagnostic accuracy and assisting in the prompt management of the condition in clinical settings.

II. LITERATURE REVIEW

In 2023, Shoukat and colleagues devised an automated technique for identifying glaucoma in retinal scans by employing a deep learning methodology. The study employed the ResNet-50 architecture and specifically examined the gray channels of fundus pictures. Data augmentation techniques were applied to generate a diverse dataset. The performance of this model on the G1020 dataset was exceptional, with an accuracy of 98.48%, sensitivity of 99.30%, and specificity of 96.52%. Nevertheless, the primary constraint of this method is its reliance on top-notch fundus pictures and the requirement for a resilient dataset for successful training [6]. In 2022, Akter et al. sought to improve the diagnosis of glaucoma by combining several characteristics from Optical Coherence Tomography (OCT) pictures and utilizing advanced machine learning methods. The study conducted an analysis to determine the most important characteristics and utilized a deep learning model to achieve a strong diagnostic performance, with an Area Under the Curve (AUC) value of 0.98 and an accuracy rate of 97% on the test dataset. One significant drawback of this method was its dependence on cross-sectional OCT images, which may not be readily accessible in all clinical environments [7]. In 2022, Joshi et al. introduced a computer-aided design (CAD) system that utilizes image processing and supervised learning techniques to identify glaucoma. The system utilized an ensemble-based deep learning model that incorporated pretrained networks such as ResNet and GoogLeNet. It achieved an impressive accuracy of up to 98.67% on the HRF dataset. An important drawback of this strategy is the inconsistency in performance when used to different datasets, highlighting the necessity for

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Exploring Diabetic Retinopathy Diagnosis: Insights from a Comprehensive Literature Review and Initial Fundus Image Analysis

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Abstract: **This article looks at recent advances in diabetic retinopathy (DR) detection with retinal fundus and optical coherence tomography angiography (OCTA) pictures. Key studies have investigated a variety of methods, including combining Multiscale Retinex with Chromaticity Preservation (MSRCP) and Bi-LSTM networks for high accuracy, integrating the Internet of Things (IoT) with deep learning for increased sensitivity, and using Multi-Stream Deep Neural Networks to classify DR severity. Innovations like the PMNPDR system for microaneurysm detection and deep learning ensembles for OCT images have also performed well. Despite these gains, issues like as data transfer latency, model complexity, and reliance on tiny datasets remain. Overall, while current models show great potential, they require further modification and validation to assure their efficacy and applicability in clinical situations.**

Keywords: Retinal Fundus, Diabetic Retinopathy, OCTA, Deep Learning, Accuracy, Image Processing.

I. INTRODUCTION

Diabetic retinopathy stands as a severe diabetes condition that could result in vision loss and loss of sight if not detected and treated promptly. The prevalence of DR is increasing internationally as diabetes rates rise, making early detection and monitoring critical. Traditional methods of diagnosing DR, such as clinical examination and fluorescein angiography, are frequently intrusive and may not give the level of detail needed for a thorough evaluation. In response, researchers are increasingly relying on advanced imaging techniques and deep learning algorithms to improve the efficiency also accuracy of DR detection and categorization [1-2].

Recent advances in retinal imaging technology, including retinal fundus photography and Optical Coherence Tomography Angiography (OCTA), have transformed the profession of ophthalmology. Retinal fundus pictures provide precise views of the retina, enabling for the detection of DR-specific indications like microaneurysms, exudates, and hemorrhages. In contrast, OCTA provides high-resolution images of the retinal vasculature, allowing for insights into the vascular alterations associated with DR [3]. The combination of several imaging modalities and deep learning algorithms has showed promise in automating and enhancing the accuracy of DR diagnosis, lowering the need for manual interpretation and increasing diagnostic throughput.

Despite these gains, there are still significant hurdles to using deep learning models for DR detection. Data transfer latency, model complexity, and the necessity for huge, well-annotated datasets all provide substantial challenges. Furthermore, these models' generalizability and clinical usefulness must be rigorously validated and refined on an ongoing basis. As the area evolves, overcoming these problems will be critical to producing dependable, cost-effective solutions that can be broadly deployed in clinical practice to improve patient care and outcomes.

II. RELATED WORKS

A Bi-Directional Long Short-Term Memory (Bi-LSTM) centered Diabetic Retinopathy discovery model employing retinal fundus pictures was proposed by M.S.B. Phridviraj et al. in 2023. In order to detect diabetic retinopathy, the study coupled the MSRCP (Multiscale Retinex with Chromaticity Preservation) approach with Bi-LSTM, paying particular attention to vascular anomalies associated with the illness. Using datasets from IDRiD, MESSIDOR, and Kaggle, this technique

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AIADS-20
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Integrated Methodology for Early Glaucoma Diagnosis Using Retinal Fundus Images

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Abstract: **This research explores a comprehensive methodology to glaucoma discovery using retinal fundus images, aiming to enhance diagnostic precision through advanced machine learning techniques. We begin with a diverse dataset of retinal images, applying bilinear interpolation for resizing, and convert images to greyscale using the Luminosity method to highlight relevant features. Noise is reduced using an adaptive Normalized Least Mean Squares (NLMS) filter, followed by histogram equalization to improve contrast. Feature extraction is accomplished using the method called Histogram of Oriented Gradients (HOG). These features are then classified with a combined model of ResNet-50 and Multiclass Support Vector Machine (MCSVM). The model's efficacy is evaluated using precision, accuracy, recall, and F1-score metrics, demonstrating high effectiveness with an 98.66% of accuracy, 98.99% of precision, and 97.87% of recall. Future work will focus on expanding the dataset, integrating multi-modal data, and enhancing model explainability to further improve glaucoma detection accuracy.**

Key Words: Glaucoma, Visual, Deep Learning, Diagnosis, Accuracy, Precision, recall.

I. INTRODUCTION: The incidence of glaucoma has become a prominent issue in the field of ophthalmology in recent years, since it is now recognized as one of the primary causes of permanent blindness on a global scale [1-2]. Glaucoma is defined by the gradual deterioration of the optic nerve, typically accompanied with heightened pressure within the eye, resulting in a gradual decline in eyesight. Prompt identification and quick care are crucial in averting the severe consequences of this illness. Nevertheless, conventional techniques for detecting glaucoma, including as visual field testing and optical coherence tomography (OCT), can be laborious, expensive, and frequently necessitate the presence of an expert [3-4].

Due to progress in medical imaging and machine learning, there is an increasing need to create automated systems that can aid in the prompt identification and diagnosis of glaucoma utilizing retinal pictures. The objective of these devices is to offer a cost-efficient, non-intrusive, and effective method of examining large groups of people, which allows for early detection and decreases the impact of blindness caused by glaucoma.

This study presents an innovative approach for identifying glaucoma by analyzing retinal fundus images utilizing sophisticated image processing methods and deep learning models. This method utilizes the capabilities of convolutional neural networks (CNNs), namely ResNet-50, along with a Multiclass Support Vector Machine (MCSVM), to accurately categorize retinal pictures as either glaucoma or non-glaucoma.

II. LITERATURE REVIEW:

In 2023, Diaz-Pinto et al. [6] performed an extensive investigation to verify the accuracy of

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H&S-1

AI-Enhanced Analysis of Unsteady Convection in Copper-Water Nanofluid Flow over a Vertically Moving Porous Plate

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Abstract: ***The dynamic behaviour of unsteady convection in a copper-water nanofluid, wherein a vertically moving porous plate serves as the medium for heat transfer. The study leverages artificial intelligence (AI) techniques to enhance the understanding of the complex fluid dynamics and thermal characteristics involved in this scenario. The application of AI algorithms facilitates a comprehensive analysis of the nanofluid's behavior, allowing for more accurate predictions and insights into the heat transfer processes. The results contribute to the advancement of both nanofluid dynamics and AI applications in fluid mechanics, offering valuable information for engineering and technological advancements. This study examines MHD convective flow over a perpendicular porous plate using Laplace transforms. Analytical evaluation and computational discussion of temperature, velocity, Nusselt number, and shear stress reveal engineering tool applications. Velocity rises with permeability, and stress elevates with magnetic parameters.***

Keywords: Free convection, MHD flows, nanofluid, porous medium, Laplace method

I. INTRODUCTION:

In fluid dynamics and heat transfer, studying nanofluid convection reveals unique challenges and technological opportunities. This research investigates unsteady convection in copper-water nanofluid, focusing on its interaction with a vertically moving porous plate. Nanofluids, with enhanced thermal properties, are crucial for industry. Integrating artificial intelligence (AI) into the study enhances the analysis of complex systems, addressing real-world complexities[1]. By unraveling fluid flow, heat transfer, and nanoparticle dispersion, this research contributes to scientific understanding and offers potential for optimizing heat transfer in practical applications. The study aligns with the demand for sustainable heat transfer systems in emerging technologies[2]. The combination of nanofluid properties and AI capabilities positions this research at the forefront of innovative approaches to contemporary challenges in heat transfer engineering. The investigation of unsteady convection introduces temporal complexities[3], demanding a nuanced understanding for effective system design and optimization [4].

II. THE FORMULATION OF THE ISSUE AS WELL AS THE PROPOSED SOLUTION:

This study addresses MHD convective flow over a perpendicular porous plate[5][6], investigating the impact of permeability and magnetic parameters on velocity and stress[7]. The fundamental issue is understanding these dynamic interactions for engineering applications [8]. To solve this, Laplace transforms are employed for analytical evaluation [9].

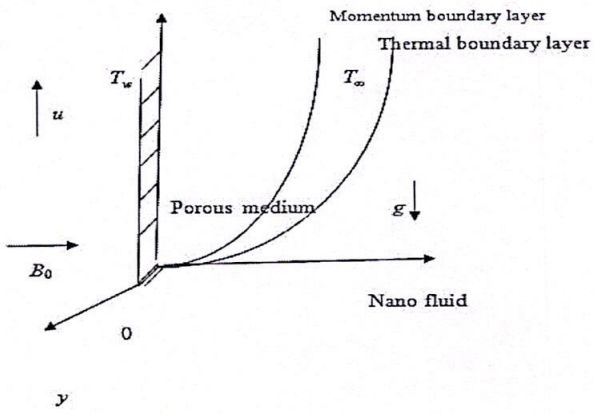

Fig. 1 Physical configuration of the Problem

The study [10] proposes a comprehensive examination of temperature, velocity, Nusselt number, and shear stress[11]. The findings reveal that as the permeability parameter increases,

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1145-2

Machine Learning Analysis of Free Convection Flow through a Porous Medium in a Third-Grade Vertical Channel: A Comprehensive Exploration

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Abstract: ***The analysis of fully developed unfixed convection in a vertical channel with a third-grade fluid and porous medium involves solving complex non-linear equations for speed and temperature fields. To augment this process, machine learning techniques offer valuable contributions. Machine learning algorithms facilitate the creation of predictive models, extracting insights from extensive data, optimizing parameters for efficiency, and conducting sensitivity analyses to understand system responses. Furthermore, these algorithms aid in reducing computational costs through surrogate models and metamodels, recognizing intricate patterns, and enabling real-time monitoring and control for adaptive strategies. By integrating machine learning, the study benefits from enhanced prediction accuracy, data-driven decision-making, and a deeper comprehension of the intricate dynamics governing fluid flow and temperature distribution in the vertical channel.***

Keywords: metamodels, Convection, Machine learning, Predictive models, Sensitivity analyses, Fluid flow

I. INTRODUCTION:

Free convection flow through porous media holds significant importance in various engineering applications, particularly in the context of heat transfer processes. The third-grade vertical channel, characterized by its non-Newtonian behavior, presents a challenging yet intriguing scenario for studying convective heat transfer. The interaction between the fluid flow and the porous structure adds layers of complexity to the convective phenomena, necessitating advanced analytical tools for a comprehensive understanding [1].

Traditional approaches in fluid dynamics have provided valuable insights into convection flows; however, the intricate nature of the third-grade vertical channel requires a more nuanced and predictive analysis[2]. Recent years saw machine learning emerge, modeling complex systems and predicting intricate patterns. This study integrates machine learning to bridge conventional and intricate fluid dynamics in free convection through a porous medium [3].

The integration of machine learning methodologies enables us to explore and predict the complex interactions within the porous medium, offering a more holistic perspective on the convective heat transfer process [4]. Research contributes to knowledge by deepening understanding of mechanisms governing free convection in porous media, emphasizing third-grade vertical channels [5]. The insights gained from this study hold the potential to inform and optimize the design of systems involving porous media, facilitating advancements in various engineering applications such as geothermal energy extraction, environmental remediation, and thermal management systems [6].

Furthermore, the utilization of machine learning in this context is motivated by the need for more accurate and efficient predictive models [7]. Traditional analytical methods often face challenges in capturing the intricate and non-linear relationships inherent in porous media flows. Machine learning algorithms, being data-driven and capable of adapting to complex patterns, offer a promising avenue to address these challenges [8].

The third-grade vertical channel, characterized by the non-Newtonian behavior of the fluid, introduces additional complexities that necessitate a sophisticated approach [9]. The viscosity variation in non-Newtonian

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MBA-1

SHAPING BRAND PERCEPTION: THE ROLE OF INFLUENCER MARKETING IN CONSUMER ATTITUDES AND ENGAGEMENT

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ABSTRACT

Influencer marketing has become a powerful tool in shaping consumer attitudes and engagement, significantly impacting brand-consumer relationships in the digital age. This research examines the role of influencer credibility, authenticity, and engagement strategies in influencing consumer trust, purchase intention, and brand loyalty. Using a quantitative research approach, data was collected from 500 respondents actively engaging with influencer content on platforms like Instagram, TikTok, and YouTube. The analysis revealed that influencer credibility ($r = 0.72$, $p < 0.01$) and authenticity ($r = 0.68$, $p < 0.01$) are key drivers of consumer trust and purchase intention. Additionally, micro-influencers showed higher engagement rates than celebrity influencers, emphasizing the importance of relatability in fostering consumer-brand connections. Regression analysis further confirmed that influencer credibility ($B = 0.42$, $p < 0.01$) and authenticity ($B = 0.38$, $p < 0.01$) significantly predict positive consumer attitudes, while platform-specific effects were less influential ($B = 0.15$, $p = 0.08$). These findings highlight the need for brands to focus on building genuine relationships through trusted influencers rather than relying solely on large follower counts or platform trends.

The study's results have important implications for businesses and marketers aiming to leverage influencer marketing effectively. Brands should prioritize collaborations with credible and authentic influencers to maximize consumer trust and engagement. Micro-influencers, due to their relatability and higher engagement levels, present a valuable opportunity for brands seeking to connect with niche audiences. Furthermore, the research suggests that content quality and influencer trustworthiness are more critical factors in consumer response than the specific platform used. As influencer marketing continues to evolve, future research should explore emerging trends such as AI-driven content and virtual influencers to assess their impact on consumer behavior. By understanding the key factors that drive consumer attitudes and engagement, brands can refine their influencer marketing strategies to enhance brand loyalty and long-term consumer relationships.

Keywords: Influencer Marketing, Consumer Engagement, Brand Trust, Social Media Influence

INTRODUCTION

Influencer marketing has transformed the way brands communicate with consumers in the digital age. Unlike traditional advertising methods, which rely on mass media and celebrity endorsements, influencer marketing leverages social media personalities to build trust and

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