



CIVIL ENGINEERING DEPARTMENT

ACTIVITY REPORT

Name of the Activity : “Trends of AI&ML in Civil Engineering”

Speaker Name : Dr S. T. G Raghukanth

Designation : Professor, Structural Engg. IIT Madras

Date of the Program: 18/11/2025

Mode : **Offline**

Venue : Smart Class Room, Civil Engineering Department



The Civil Engineering faculty had an insightful interaction with **Prof. STG Raghukanth**, distinguished Professor from **IIT Madras**, focusing on the **emerging role of Artificial Intelligence (AI) and Machine Learning (ML)** in the field of Civil Engineering. The session aimed to understand the technological advancements reshaping the civil engineering landscape and how academic institutions can prepare students and faculty for these modern demands.

The meeting was organized to:

- Explore **AI/ML applications** in civil engineering domains.
- Understand the **latest research trends** in computational modelling and smart infrastructures.
- Discuss the **future skills** required for civil engineers.
- Seek guidance on **curriculum enhancement** to align with industry advancements



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Key Discussion Points

AI/ML in Structural Engineering

Prof. Raghukanth highlighted how ML models are being used for:

- Predicting structural performance using historical data.
- Assessing seismic vulnerability and hazard mapping.
- Improving accuracy in structural health monitoring systems.

Applications in Geotechnical Engineering

He explained that AI helps in:

- Soil classification using data-driven algorithms.
- Predicting bearing capacity and slope stability.
- Modelling complex ground behaviour that is difficult using traditional empirical methods.

AI in Transportation Engineering

Important insights included:

- Intelligent transportation systems (ITS)
- Traffic flow prediction models
- Optimization of signal timings
- Data-driven accident analysis



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Water Resources and Environmental Engineering

The discussion covered:

- Flood forecasting and hydrological modelling using ML.
- Water quality prediction systems.
- Decision support systems for environmental management.

Future of Civil Engineering with AI/ML

Prof. Raghukanth emphasized that the future civil engineer must:

- Be familiar with **programming, data analysis, and ML concepts**.
- Work with large datasets for better decision-making.
- Integrate sensors, IoT, and AI for smart city development.
- Adopt predictive modelling to improve planning and maintenance.

He also stressed that AI will not replace civil engineers, but **engineers who use AI will replace those who do not**.

Recommendations by Prof. Raghukanth

- Introduce **AI/ML courses** in the civil engineering curriculum.
- Encourage **interdisciplinary projects** with computer science and electronics departments.
- Provide training workshops on **Python, MATLAB, and data analytics tools**.
- Promote faculty research in computational mechanics and smart infrastructure systems.

Conclusion

The interaction with **Prof. STG Raghukanth** was highly beneficial, offering a clear understanding of how AI and ML are transforming civil engineering practices. The session provided valuable direction for strengthening research, updating teaching methodologies, and preparing students for the future industry. It marked an important step toward modernizing the department's academic and research capabilities.


HOD- C.E

Dr. N R Gowthami

Asst. Professor,
Department of Civil Engineering,
AITS Rajampet