

A Seminar on

Harnessing the Power of Edge AI Innovations and Real-World Benefits

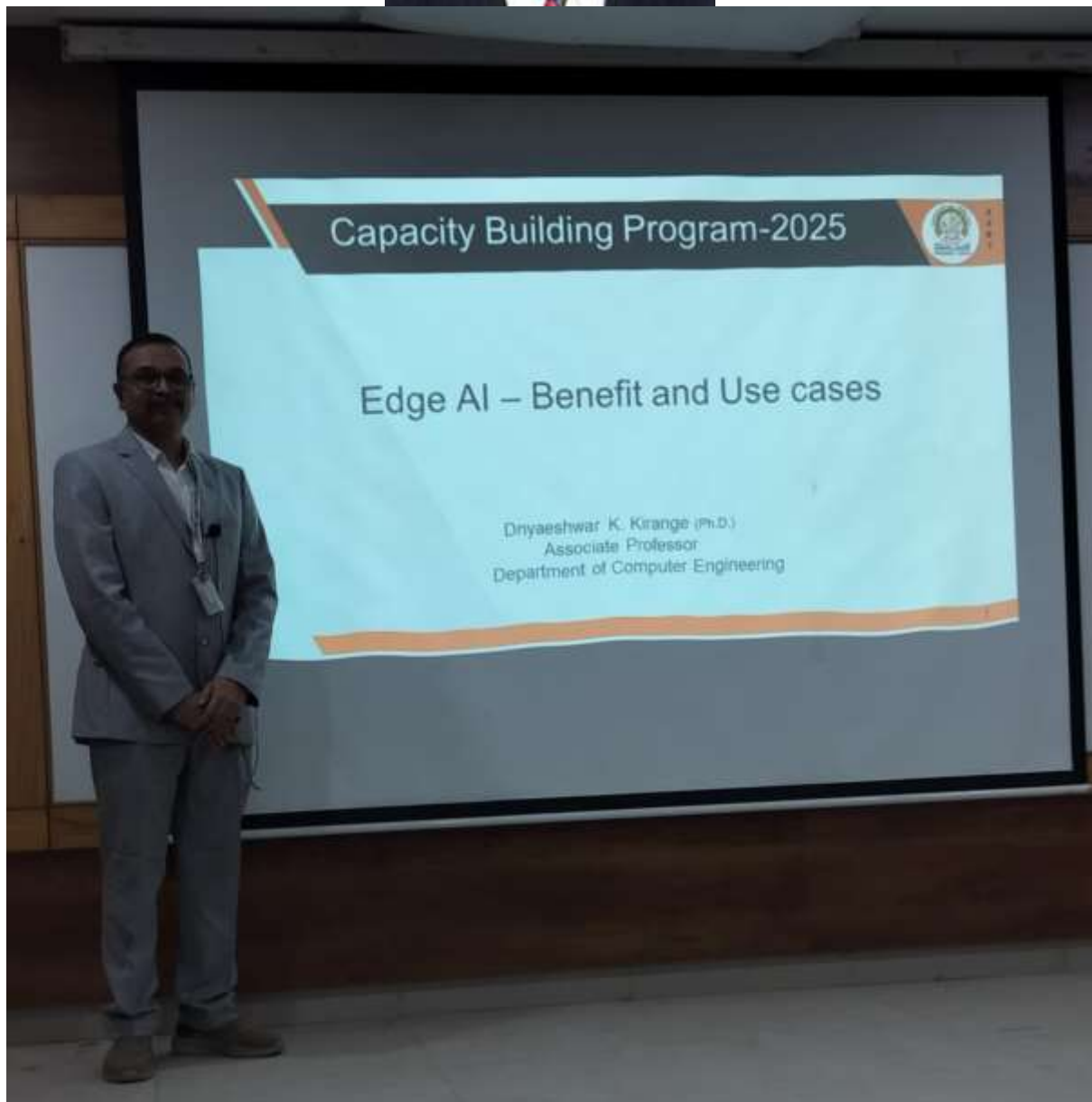
Activity Report

| | |
|---|--|
| Academic Year | 2024-25 |
| Program Driven by | A Seminar on Harnessing the Power of Edge AI Innovations and Real-World Benefits |
| Quarter | II |
| Program / Activity Name | A Seminar on Harnessing the Power of Edge AI Innovations and Real-World Benefits |
| Program Type | |
| Program Theme | Innovation and startups |
| Start Date | 15-02-2025 |
| End Date | 15-02-2025 |
| Duration of the Activity (in Mins) | 60 |
| Number of Student Participant | 50 |
| Number of Faculty Participant | 70 |
| Number of external Participant | -- |
| Expenditure Amount in Rs. | |
| Any Remark | -- |
| Mode of Session Delivery | Offline |
| | |
| | |
| Objective | |
| Benefit in terms of Learning / Skills / Knowledge obtained | |
| Feedback | |
| Video url (mp4) | |
| Photograph 1 (jpg) | Attached |
| Photograph 2 (jpg) | Attached |
| | |
| Overall report of the Activity (pdf) | As given below |



Dr. P. H. Zope

Convener IIC





Harnessing the Power of Edge AI: Innovations and Real-World Benefits

Introduction

Edge Artificial Intelligence (Edge AI) is revolutionizing how data is processed by enabling AI computations at the source of data generation rather than relying on centralized cloud systems. This shift brings numerous advantages, including reduced latency, improved security, and enhanced efficiency. As Edge AI continues to evolve, its impact spans industries such as healthcare, manufacturing, autonomous vehicles, and IoT. This report explores the innovations driving Edge AI and its real-world benefits.

Innovations in Edge AI

Edge AI is advancing rapidly due to breakthroughs in hardware, software, and machine learning algorithms. Some key innovations include:

1. AI-Optimized Edge Processors

- Specialized AI chips, such as Tensor Processing Units (TPUs) and Neural Processing Units (NPU), enhance AI inference at the edge.
- Low-power AI accelerators improve efficiency in battery-operated devices.

2. Efficient Machine Learning Models

- Model compression techniques such as quantization and pruning enable AI models to run efficiently on edge devices.
- Federated learning allows AI models to be trained locally on edge devices while preserving data privacy.

3. 5G and Edge AI Synergy

- 5G networks enhance real-time data processing capabilities of Edge AI applications.
- Low-latency connectivity supports critical applications such as autonomous driving and smart cities.

4. AI-Powered IoT Devices

- AI-enabled sensors and IoT devices facilitate intelligent decision-making without cloud dependency.
- Real-time analytics enhance automation in industries like agriculture and smart homes.

Real-World Benefits of Edge AI

The integration of AI at the edge provides several practical benefits across various industries:

1. Reduced Latency and Faster Decision-Making

- Edge AI eliminates the need for constant cloud communication, enabling real-time processing.
- Autonomous vehicles and industrial robots benefit from ultra-fast decision-making capabilities.

2. Enhanced Data Privacy and Security

- Sensitive data remains on local devices, reducing the risk of data breaches.
- Healthcare applications leverage Edge AI for secure patient data processing without cloud exposure.

3. Lower Bandwidth and Cloud Costs

- Edge AI reduces data transmission to centralized servers, optimizing bandwidth usage.
- Businesses save costs associated with cloud storage and processing.

4. Improved Reliability and Offline Functionality

- Edge AI ensures continued operation even in environments with limited or no internet connectivity.
- Remote locations, such as oil rigs and rural areas, benefit from uninterrupted AI functionalities.

5. Personalized and Adaptive AI Experiences

- AI-powered edge devices tailor user experiences based on real-time local data.
- Smart home systems and wearable devices adjust to user preferences without cloud dependency.

Future Prospects of Edge AI

The future of Edge AI is promising, with ongoing advancements in:

- **AI-driven cybersecurity** to enhance device security at the edge.
- **Autonomous edge systems** for drones, robots, and smart infrastructures.
- **Integration with blockchain** for secure and transparent edge data transactions.

Conclusion

Edge AI is transforming industries by enabling efficient, secure, and real-time AI-powered solutions. Its innovations in hardware, connectivity, and machine learning are paving the way for a smarter, decentralized computing landscape. As technology continues to evolve, Edge AI will play an increasingly vital role in shaping the future of intelligent automation and decision-making.



| | Decimal | DMS |
|-----------|-----------|------------|
| Latitude | 21.014066 | 21°0'50" N |
| Longitude | 75.502681 | 75°30'9" E |

