



**MALLA REDDY COLLEGE OF ENGINEERING**

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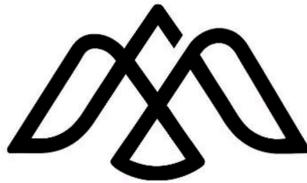
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**A Report of**  
**National level 5 Days Faculty Development Program**  
**On**  
**Advanced Machine Learning**

**Organized by:**

**Department of CSE (AI & ML)**

**Target Audience: Teaching Faculties**



In association with

**Institution Innovation Council and Plexus Club**

Date : Date: 3<sup>rd</sup> June 2024 – 7<sup>th</sup> June 2024

Mode : Online



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### **ABOUT THE INSTITUTION**



**MRCE, BLOCK-A**

Malla Reddy College of Engineering (Formerly CM Engineering College) has been established under the aegis of the Malla Reddy Group of institutions in the year 2005, a majestic empire, founded by chairman Sri. Ch. Malla Reddy. He has been in the field of education for the last 22 years with the intention of spearheading quality education among children from the school level itself.

Since the beginning Mr. Malla Reddy has endeavoured to ensure quality education and carved a niche for himself by managing this group of institutions.

Malla Reddy College of Engineering has been laid upon a very strong foundation and has ever since been excelling in every aspect. The bricks of this able institute are certainly the adept management, the experienced faculty, the selfless non-teaching staff and of course the students.



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### **INSTITUTION VISION:**

To emerge as a centre of Excellence for producing professionals who shall be the leaders in technology innovation, entrepreneurship, and management and in turn contribute for advancement of society and human kind.

### **INSTITUTION MISSION:**

- To provide an environment of learning in emerging technologies.
- To nurture a state of art teaching learning process and R&D culture.
- To foster networking with Alumni, Industry, Institutes of repute and other stakeholders for effective interaction.
- To practice and promote high standards of ethical values through societal commitment.

### **VISION OF THE DEPARTMENT**

To teach excellence education for undergraduates in the field of Artificial Intelligence and Machine Learning in the technological-embedded domain and make professionals who help the better cause of society.

### **MISSION OF THE DEPARTMENT**

- Impart demanding training to create knowledge through the state-of-the-art ideas and skills in Artificial Intelligence and Machine Learning.
- Facilitate the students to adapt to the rapidly changing technologies by providing cutting-edge laboratories and facilities.
- Kick off the research and training, paying special attention to the essential skills of the subsequent generation's workforce.



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### **ABOUT CSE (AI&ML) DEPARTMENT**

The Department of Artificial Intelligence and Machine Learning (AI&ML) was founded in 2020 with the goal of providing high-quality higher education to as many students as possible and to satisfy the enormous need for highly trained professionals in the industry. The Department of AI&ML offers a B. Tech program in Computer Science and Engineering (Artificial Intelligence and Machine Learning). The curriculum is created to give students a firm foundation in AI and ML principles and concepts as well as practical experience in handling situations from the real world. Programming languages, computer architecture, machine learning, natural language processing, artificial intelligence, and deep learning are some of the department's core subjects. Students are continuously trained with an attitude of excellence to overcome automation challenges across all industries and provide new context and background to improve the agile process with the assistance of great laboratory facilities and well-qualified faculty members. Because of the program's interdisciplinary nature, it draws on knowledge and coursework from many different disciplines, including computer science, mathematics, and statistics. Students will have the chance to take part in research projects in addition to the required courses, both inside the department and with other departments and organizations. Students who complete the B.Tech. programme in Computer Science and Engineering (Artificial Intelligence and Machine Learning) will be well-versed in the theories and methods of AI & ML and will be qualified for employment in a range of fields and positions, including data analysis, software development, and research.



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### **Poster:**

DEPARTMENT OF CSE(AIML)  
ORGANIZES

**FACULTY DEVELOPMENT  
PROGRAM ON  
ADVANCED  
ML-RESEARCH  
PERSPECTIVE**

**SPEAKERS**

**DAY 1:** Dr. G. Sucharitha, Professor, Anurag University  
**DAY 2:** Dr. T. Kishan Rao, Professor, KPRIT  
**DAY 3:** Dr. J. Srikanth, Associate Professor, MRECW  
**DAY 4:** Dr. Ch. Lalitha Saroja, Associate Professor, SCET  
**DAY 5:** Dr. P. Nageshwara Rao, Associate Professor, SCET

Date: 3<sup>rd</sup> June 2024 – 7<sup>th</sup> June 2024

*Convener*  
Dr. Maram Ashok  
Principal, MRCE

*Co-Convener*  
Dr. Anantha Raman G R  
HOD-CSE(AIML)



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### **ABOUT THE EVENT**

The Department of Computer Science and Engineering successfully organized a National Level Faculty Development Programme (FDP) on “**Advanced Machine Learning and Its Applications.**”

Machine Learning has become a core technology driving innovation in areas such as data science, artificial intelligence, predictive analytics, computer vision, and natural language processing. This FDP was designed to deepen participants’ understanding of advanced machine learning concepts, algorithms, and real-world applications, with a strong emphasis on practical implementation and research-oriented approaches.

The program provided hands-on exposure to modern machine learning techniques, model evaluation strategies, and emerging trends, enabling faculty members to effectively incorporate advanced machine learning methodologies into teaching, research, and interdisciplinary academic projects.

The FDP witnessed enthusiastic participation from faculty members belonging to engineering, science, management, and allied disciplines from various institutions across the country. In the following days, the sessions covered diverse and impactful topics such as:

#### **Day 1 – Foundations of Machine Learning**

Session 1: Introduction to Machine Learning Concepts

Overview of machine learning fundamentals, types of learning (supervised, unsupervised, and reinforcement), and real-world applications across domains.

Session 2: Data Preprocessing and Feature Engineering

Understanding data collection, cleaning, normalization, handling missing values, and feature extraction techniques essential for building effective models.



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### Session 3: Exploratory Data Analysis (EDA)

Statistical analysis and visualization techniques to understand data patterns, correlations, and insights prior to model building.

## **Day 2 – Supervised Learning Techniques**

### Session 1: Regression Algorithms

In-depth study of linear, multiple, and regularized regression models, along with evaluation metrics and practical use cases.

### Session 2: Classification Algorithms

Detailed discussion on decision trees, k-nearest neighbours, support vector machines, and ensemble methods for classification problems.

### Session 3: Model Evaluation and Validation

Understanding performance metrics, cross-validation techniques, bias-variance trade-off, and model optimization strategies.

## **Day 3 – Unsupervised Learning and Dimensionality Reduction**

### Session 1: Clustering Techniques

Exploration of k-means, hierarchical clustering, and density-based methods with real-world examples.

### Session 2: Association Rule Mining

Introduction to frequent pattern mining, Apriori algorithm, and market basket analysis applications.



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### Session 3: Dimensionality Reduction Techniques

Understanding PCA, LDA, and feature selection methods to reduce complexity and improve model performance.

## **Day 4 – Advanced Machine Learning Techniques**

### Session 1: Ensemble Learning Methods

Working with bagging, boosting, random forests, and gradient boosting techniques for improved predictive performance.

### Session 2: Introduction to Deep Learning

Fundamentals of neural networks, activation functions, and training deep learning models.

### Session 3: Natural Language Processing and Computer Vision Overview

Introduction to text processing, embeddings, and basic image analysis techniques using machine learning models.

## **Day 5 – Applications of Machine Learning in Teaching and Research**

### Session 1: Machine Learning for Research and Innovation

Applying machine learning techniques to solve research problems, analyze complex datasets, and support interdisciplinary studies.

### Session 2: Model Deployment and Ethical Considerations

Basics of deploying machine learning models, understanding scalability, interpretability, and ethical issues in AI systems.

### Session 3: Open Discussion, Q&A, and Feedback

Interactive session for experience sharing, addressing participant queries, and discussing future research and learning pathways.



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The interactive nature of the FDP stood out as a strong point. Faculty participants actively engaged in discussions, shared classroom challenges, and collaborated on innovative teaching practices. By the end of the week, participants expressed that the FDP had greatly enriched with updated knowledge on **cutting-edge developments in Artificial Intelligence and to enhance their ability to integrate modern AI techniques** into teaching, research, and real-world applications

The program concluded with a **valedictory session**, during which participants shared their feedback, describing the FDP as “enlightening,” “practically useful,” and “highly motivating.” Certificates of participation were distributed to all faculty members, acknowledging their commitment to continuous learning and professional growth.

In summary, the **FDP on “Recent Advances in AI and Their Applications”** was a resounding success. It not only enhanced the professional capacity of faculty members but also equipped them with strategies to mentor and prepare students for the rapidly changing technological world. The event marked a significant step toward strengthening the bridge between academia and industry, reaffirming MRCE’s commitment to academic excellence, innovation, and holistic development.



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### **FDP – AIM, PURPOSE AND IMPORTANCE**

#### **AIM**

The aim of this Faculty Development Programme is to equip faculty members with a strong conceptual understanding and practical proficiency in advanced machine learning techniques, enabling them to design, develop, evaluate, and deploy intelligent models, analyze complex datasets, and effectively integrate machine learning–based methods and applications into teaching, research, and interdisciplinary academic problem-solving.

#### **PURPOSE**

The purpose of this FDP is to provide a comprehensive platform where participants can:

- Understand the core concepts of machine learning, including data preprocessing, feature engineering, supervised and unsupervised learning algorithms, and model evaluation techniques.
- Gain exposure to real-world and industry-relevant applications of advanced machine learning in areas such as predictive analytics, artificial intelligence, natural language processing, computer vision, and research-driven problem solving.
- Enhance their ability to design, implement, and evaluate machine learning models for academic and research projects using appropriate algorithms, tools, and frameworks.
- Learn to use modern machine learning libraries, frameworks, and development environments that support effective teaching, experimentation, and research productivity.
- Foster collaboration among faculty members by sharing best practices and exploring innovative ways to integrate advanced machine learning concepts into curriculum design, teaching methodologies, and interdisciplinary research.

#### **IMPORTANCE:**

This FDP holds significant importance as it:



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- Helps faculty stay aligned with recent advancements in machine learning and the rapidly evolving role of data-driven intelligence across diverse domains.
- Strengthens the academic ecosystem by promoting innovative, hands-on teaching strategies supported by machine learning models, tools, and real-world case studies.
- Enhances faculty competency to guide students in machine learning–based projects, internships, research work, and industry-oriented problem solving.
- Promotes the development of high-quality academic projects, research publications, intelligent systems, and interdisciplinary applications using advanced machine learning techniques.
- Prepares educators to create a future-ready learning environment where students acquire analytical thinking, data-driven decision-making, and industry-relevant AI and machine learning skills.
- Helps institutions integrate advanced machine learning concepts into curriculum design, research initiatives, innovation activities, and technological development, contributing to academic excellence and societal impact.

In essence, this FDP was not just about academic enrichment but about transforming faculty into catalysts who can inspire and guide students to thrive in the competitive global environment. It highlighted MRCE's commitment to continuous faculty development, innovation in education, and the holistic preparation of students to meet the challenges of the future workforce.



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### **SUMMARY :**

The National Level Faculty Development Programme on “Advanced Machine Learning and Its Applications”, organized by the Department of Computer Science and Engineering, Malla Reddy College of Engineering (MRCE), will be conducted entirely in online mode. To ensure effective communication and seamless coordination throughout the programme, a dedicated WhatsApp group will be created. Participants are encouraged to join the group using the shared link to stay updated, interact with fellow participants, and receive important announcements. Session links, schedules, and related information will be communicated to participants via email prior to each session.

### **Important:**

FDP Dates Date: **3rd June 2024 - 7th June 2024**

Mode: **Online**

All sessions will be conducted via **Cisco Webex**.

**Note:** We kindly request you to download and install the Cisco Webex Meetings app in advance to avoid any last-minute issues.

Total no of participants: 70

Installation links:

- **For Desktop/Laptop:** <https://www.webex.com/downloads.html>
- **For Android:**  
<https://play.google.com/store/apps/details?id=com.cisco.webex.meetings>
- **For iOS (iPhone/iPad):** <https://apps.apple.com/app/id298844386>
- **WhatsApp Group Link :** <https://chat.whatsapp.com/LB23xHpe8qy4MdT7KpA4ZS>
- **FDP Session Link :**  
<https://netacad.webex.com/netacad/j.php?MTID=m8e24f6c91db35948e76a995e3e8d5a2a>



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### **Content and Session :**

The Faculty Development Programme (FDP) commenced with a warm welcome and introductory address by **Mr. R. Venkatesh, Assistant Professor**, who acknowledged the dignitaries and organizers behind the successful conduct of the programme. He warmly welcomed the visionary leader of MRCE, our respected Principal **Dr. Maram Ashok**, who delivered the inaugural address and emphasized the importance of advanced machine learning techniques in academics, research, and emerging technologies.

### **Day 1**

**Title:** Online Faculty Development Programme

**Name of Guest Speaker:** **Dr. G. Sucharitha**, Professor, Anurag University

**Topic:** Foundations of Machine Learning

**Objectives:** Understanding machine learning fundamentals and core concepts

**Organization Name:** Malla Reddy College of Engineering

**Venue:** Online Platform

**Time:** 6:00 p.m. to 7:30 p.m.

Mr. R. Venkatesh introduced the Chief Guest, **Dr. G. Sucharitha**, Professor, Anurag University.

In her session, Dr. G. Sucharitha provided valuable insights into the **Foundations of Machine Learning**, highlighting:

- Introduction to artificial intelligence and machine learning
- Types of machine learning: supervised, unsupervised, and reinforcement learning
- Real-world applications of machine learning across various domains
- Role of data and algorithms in intelligent systems

The session laid a strong conceptual foundation for the participants.



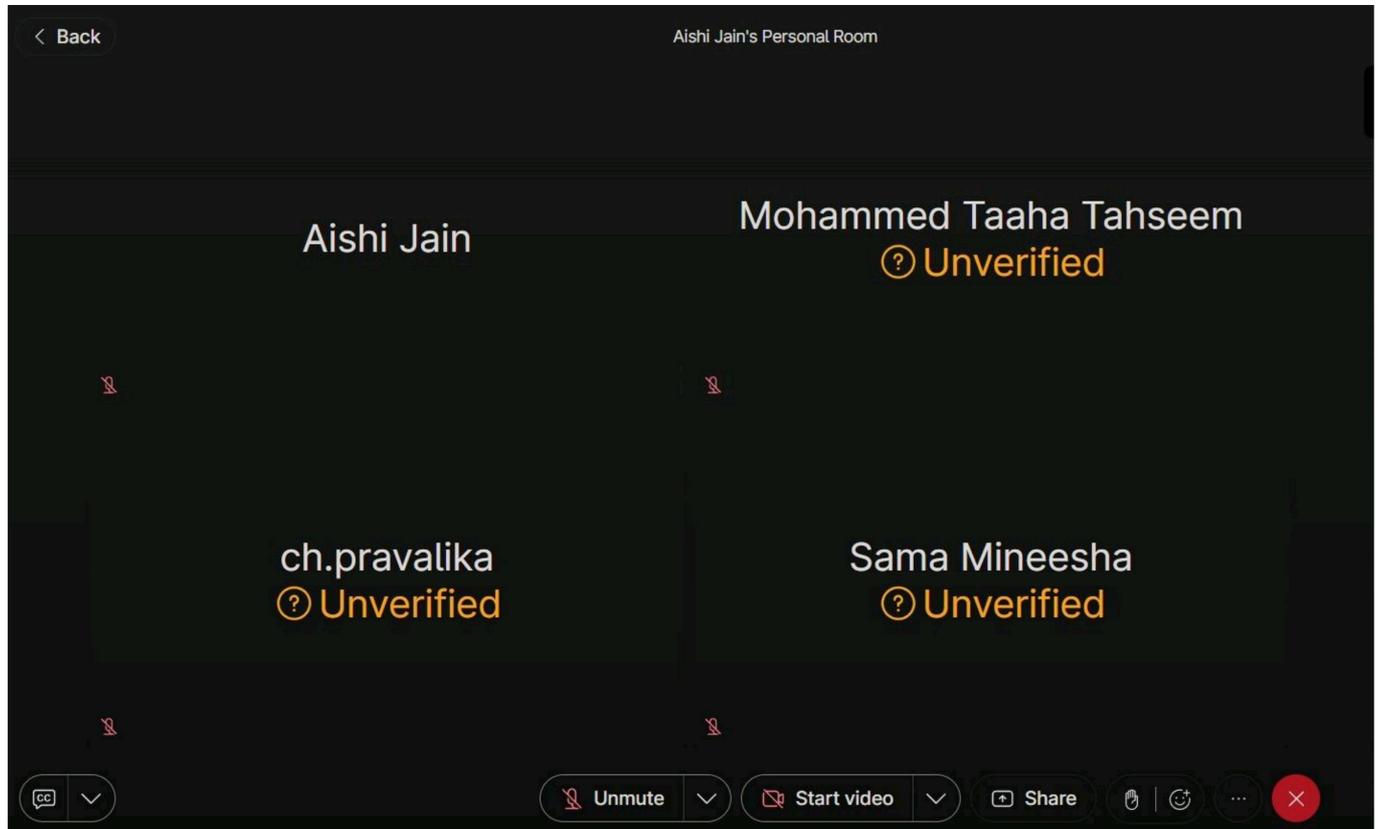
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## **Day 2**

**Title:** Online Faculty Development Programme

**Name of Guest Speaker:** Dr. T. Kishan Rao, Professor, KPRIT

**Topic:** Supervised Learning Techniques

**Objectives:** Understanding regression and classification models

**Organization Name:** Malla Reddy College of Engineering

**Venue:** Online Platform

**Time:** 6:00 p.m. to 7:30 p.m.

In his session, Dr. T. Kishan Rao delivered an in-depth explanation of **Supervised Learning Techniques**, covering:

- Linear and logistic regression algorithms
- Classification techniques such as decision trees, KNN, and SVM
- Model training, testing, and evaluation metrics
- Practical examples and academic use cases



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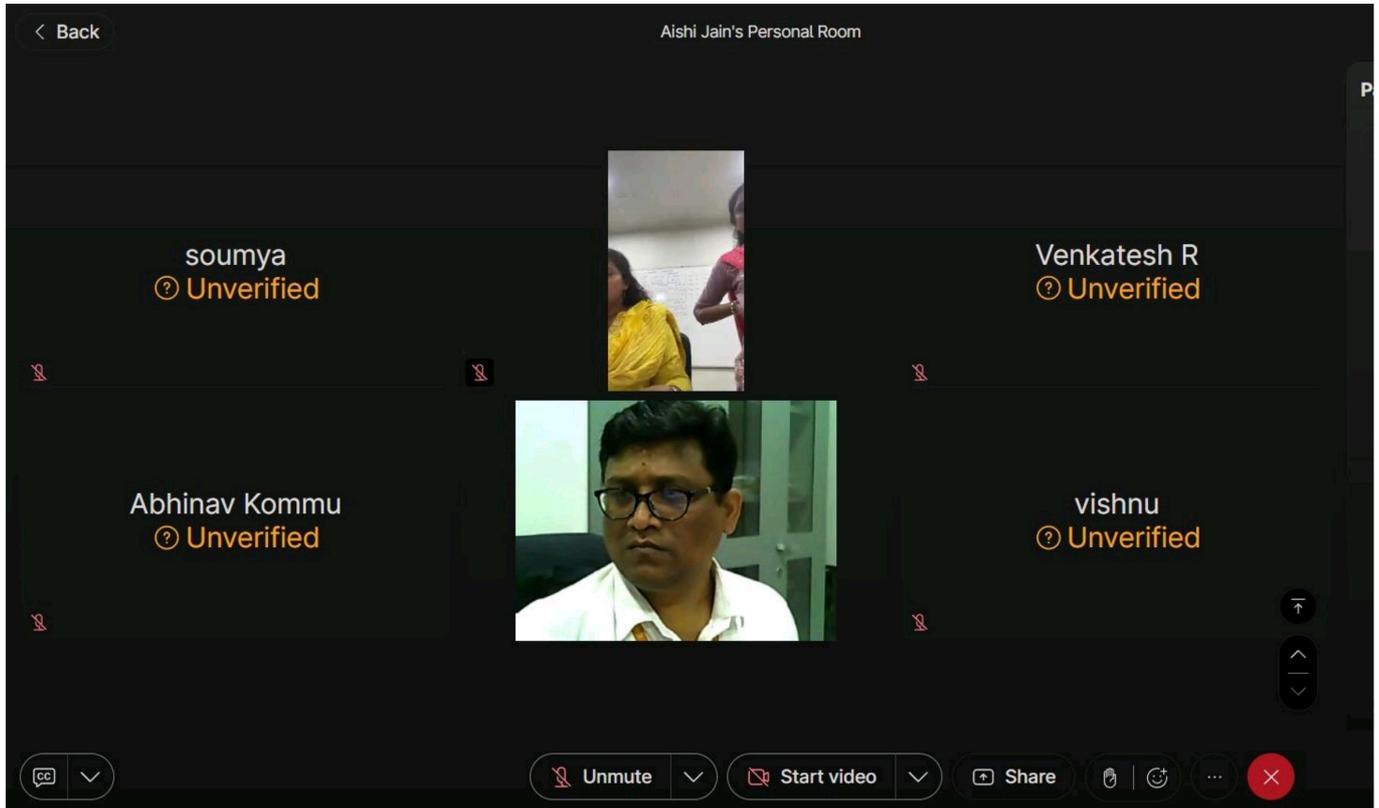
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Participants actively interacted and clarified doubts related to algorithm selection and performance analysis.



### **Day 3**

**Title:** Online Faculty Development Programme

**Name of Guest Speaker:** Dr. J. Srikanth, Associate Professor, MRECW

**Topic:** Unsupervised Learning and Dimensionality Reduction

**Objectives:** Discovering hidden patterns and reducing data complexity

**Organization Name:** Malla Reddy College of Engineering

**Venue:** Online Platform

**Time:** 6:00 p.m. to 7:30 p.m.

Dr. J. Srikanth delivered an insightful session on **Unsupervised Learning Techniques**, which included:

- Clustering methods such as K-means and hierarchical clustering
- Association rule mining concepts



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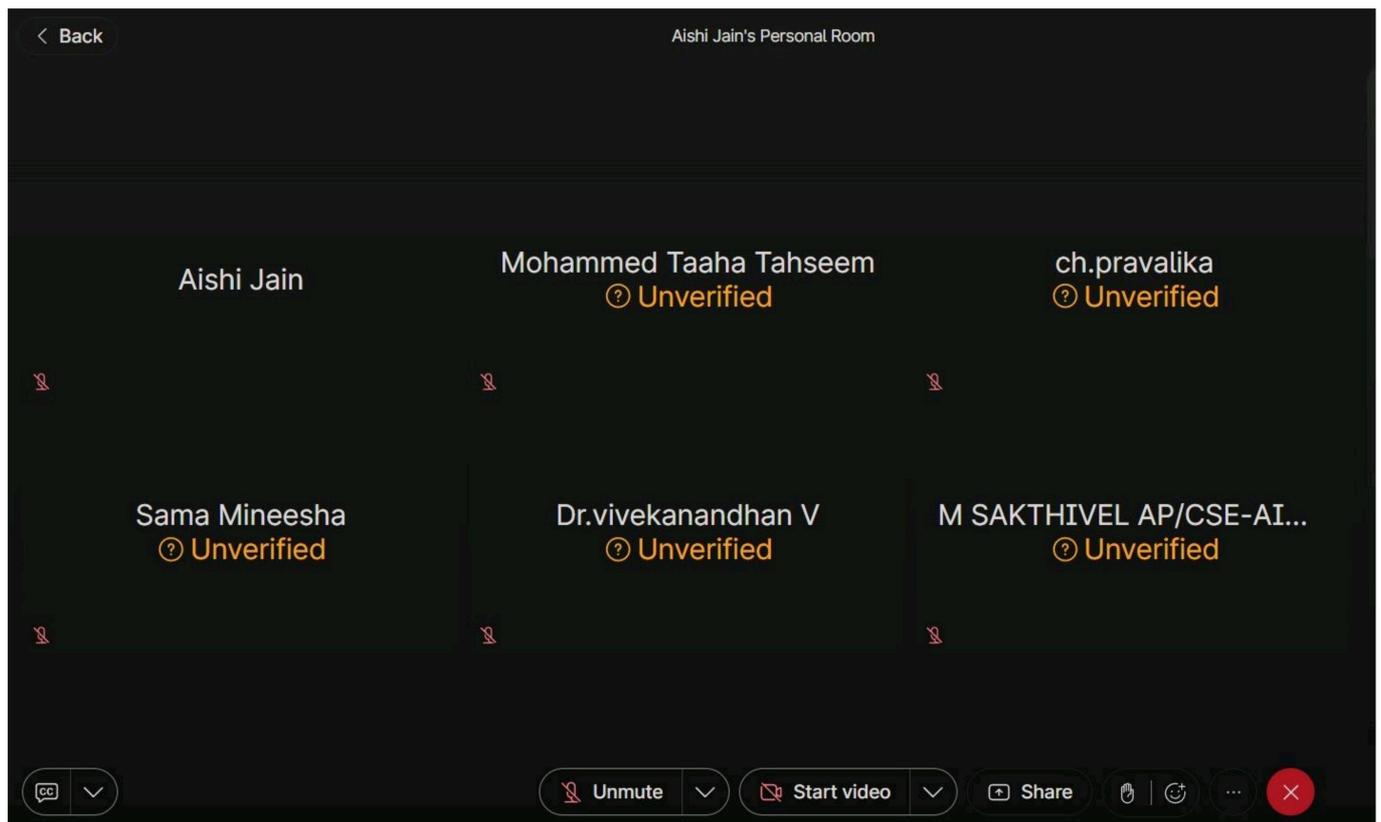
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- Dimensionality reduction using Principal Component Analysis (PCA)
- Applications of unsupervised learning in real-world datasets

The session enhanced participants' understanding of data exploration and pattern discovery.



### **Day 4**

**Title:** Online Faculty Development Programme

**Name of Guest Speaker:** Dr. Ch. Lalitha Saroja, Associate Professor, SCET

**Topic:** Ensemble Learning and Introduction to Deep Learning

**Objectives:** Improving model performance and understanding neural networks

**Organization Name:** Malla Reddy College of Engineering

**Venue:** Online Platform

**Time:** 6:00 p.m. to 7:30 p.m.

In her session, Dr. Ch. Lalitha Saroja emphasized advanced learning techniques and discussed:

- Ensemble learning methods such as bagging, boosting, and random forests



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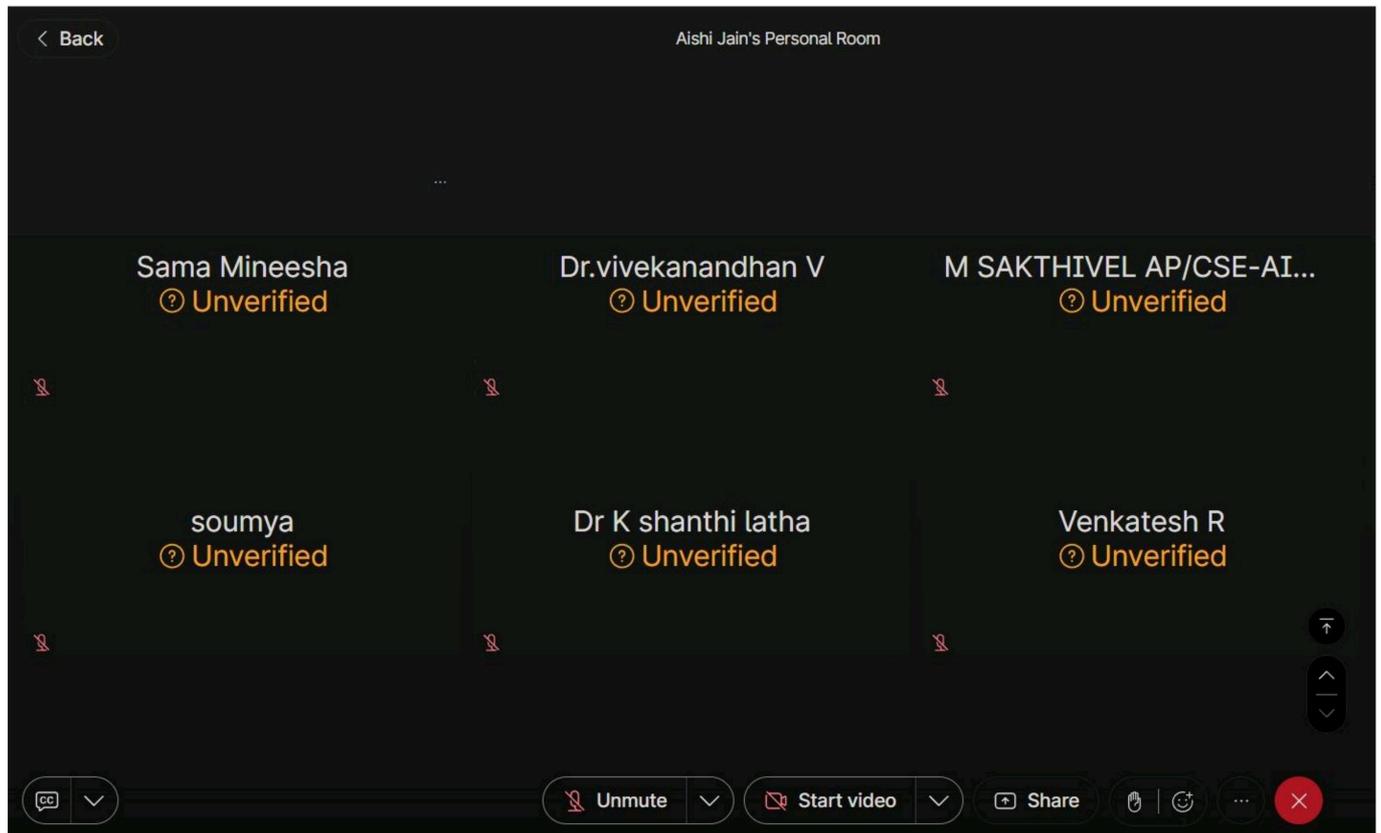
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- Activation functions and training mechanisms
- Applications of deep learning in NLP and computer vision

The session provided participants with exposure to modern machine learning trends.



## **Day 5**

**Title:** Online Faculty Development Programme

**Name of Guest Speaker:** Dr. P. Nageshwara Rao, Associate Professor, SCET

**Topic:** Machine Learning Applications in Teaching and Research

**Objectives:** Applying machine learning in academic and research environments

**Organization Name:** Malla Reddy College of Engineering

**Venue:** Online Platform

**Time:** 6:00 p.m. to 7:30 p.m.

In his session, Dr. P. Nageshwara Rao provided valuable insights on:

- Machine learning applications in academic projects and research
- Model deployment basics and ethical considerations
- Interdisciplinary research opportunities using machine learning
- Future scope of machine learning in emerging technologies



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The FDP concluded with an **interactive Q&A session and feedback**, followed by a **Vote of Thanks** delivered by **Mr. R. Venkatesh, Assistant Professor**, expressing gratitude to all resource persons and participants for their active involvement.

### **PROGRAM OUTCOMES**

#### **Program Specific Outcomes (PSOs)**

By the end of the Faculty Development Program, the participants will be able to:

#### **PSO 1 – Pedagogical Excellence**

Adopt modern teaching-learning methodologies, tools, and practices to enhance classroom engagement and knowledge delivery.

#### **PSO 2 – Research & Innovation Competence**

Apply advanced concepts, methodologies, and tools in their domain to initiate quality research, publications, and industry-oriented projects.

#### **PSO 3 – Industry-Academia Collaboration**

Integrate insights from industry experts and current technological trends into curriculum design, student mentoring, and project guidance.

#### **PSO 4 – Professional and Ethical Development**

Incorporate ethical practices, inclusivity, and lifelong learning habits in academic and research activities to serve as role models for students.



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### **Program Educational Objectives (PEOs)**

The FDP aims to enable participants to:

#### **PEO 1 – Continuous Upgradation of Knowledge**

Strengthen their subject expertise and stay updated with emerging technologies and industry practices.

#### **PEO 2 – Enhanced Teaching Competence**

Develop innovative pedagogy and assessment strategies to improve student learning outcomes and employability.

#### **PEO 3 – Research & Development Orientation**

Encourage faculty to pursue research, secure funded projects, publish in reputed journals, and contribute to academic excellence.

#### **PEO 4 – Holistic Faculty Growth**

Foster a spirit of collaboration, adaptability, and professional responsibility, ensuring that faculty contribute effectively to the institution's mission and vision.

#### **PEO 5 – Building Student-Centric Ecosystems**

Equip faculty to mentor students effectively by guiding them through internships, projects, industry certifications, and career development activities.



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### **CONCLUSION**

The Five Day Faculty Development Programme (FDP) on “Advanced Machine Learning and Its Applications” concluded successfully with a balanced combination of theoretical understanding, practical insights, and collaborative learning. Throughout the programme, participants gained a strong foundation in machine learning concepts, advanced algorithms, and their relevance to teaching, research, and academic problem-solving. The structured sessions helped faculty members understand the evolving role of machine learning in modern education and research environments.

Eminent resource persons from reputed institutions delivered insightful sessions covering key areas such as data preprocessing, supervised and unsupervised learning, ensemble techniques, and an introduction to deep learning. The sessions emphasized real-world applications of machine learning in domains including artificial intelligence, data science, predictive analytics, computer vision, and natural language processing. Interactive discussions, illustrative examples, and experience sharing enabled participants to effectively relate theoretical concepts to practical and research-oriented scenarios.

Overall, the FDP successfully achieved its objective of equipping faculty members with advanced machine learning knowledge and practical exposure required to meet contemporary academic and industry demands. The programme enhanced participants’ analytical, research, and mentoring capabilities, while encouraging the adoption of data-driven and research-focused pedagogical approaches. The successful completion of this FDP marks a meaningful step toward developing a community of educators who are technologically proficient, innovation-oriented, and well-prepared to guide students in an AI-driven and data-centric world.



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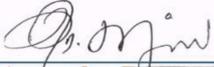
### **SAMPLE CERTIFICATE**

 **CERTIFICATE**   
OF APPRECIATION PLEXUS  
UNITED BY NERVES

THIS CERTIFICATE IS PROUDLY PRESENTED TO

***Dr. G. Sucharitha***

for the contribution as a Resource Person in the Five-Day National Level Faculty Development Program on "Advanced ML Research Perspective" conducted 03 to 07 June 2024.

  
**Dr. Anantha Raman G R**  
Co-Convener  
HOD-CSE(AIML)-MRCE



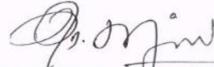
  
**Dr. Maram Ashok**  
Convener  
PRINCIPAL-MRCE

 **CERTIFICATE**   
OF PARTICIPATION PLEXUS  
UNITED BY NERVES

THIS CERTIFICATE IS PROUDLY PRESENTED TO

***Mrs. K. Sravanthi***

For participating in Five Day National level Faculty Development Program on "Advanced ML Research Perspective" conducted from 03 to 07 June 2024.

  
**Dr. Anantha Raman G R**  
Co-Convener  
HOD-CSE(AIML)-MRCE



  
**Dr. Maram Ashok**  
Convener  
PRINCIPAL-MRCE



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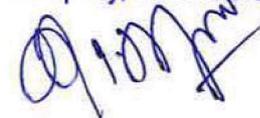
*“A National level FDP on “Advanced Machine Learning” Successfully organized and completed with support of convenor, co-convenor, Organizers.*

**Signature**

**Convenor**

  
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**THANK YOU!!**