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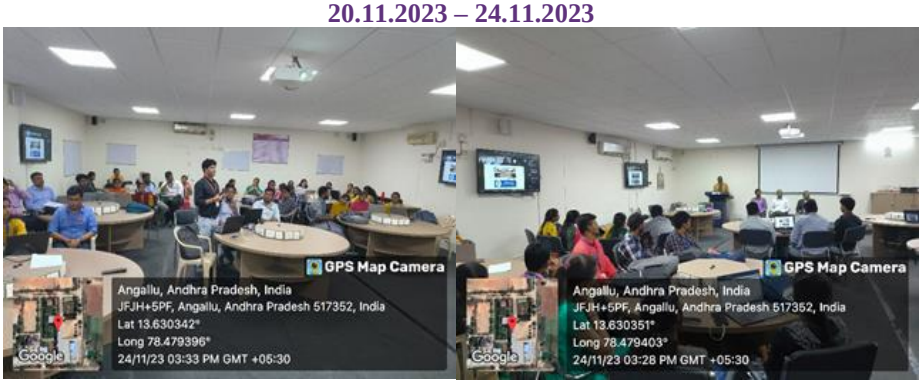
A Report on Faculty Development Program (FDP) on "Engineering Research Application of Artificial Intelligence (AI) Machine Learning (ML) and Internet of Things (IoT) using MATLAB"

Organized by Department of Electronics and Communication Engineering

Sponsored by IEEE Communication Society, Hyderabad Section

In Association with MITS IEEE Communication Society, MITS IEEE Student Branch & MathWorks

20.11.2023 – 24.11.2023



Submitted by: Dr. Sourav Ghosh, Assistant Professor, Department of Electronics and Communication Engineering, MITS MATLAB Coordinator, Madanapalle Institute of Technology & Science, Madanapalle

Event Coordinators:

1. **Dr. Sourav Ghosh, Assistant Professor, Department of Electronics and Communication Engineering.**
2. **Dr. Kumar C, Assistant Professor, Department of Electronics and Communication Engineering.**

No. of Participants: 114

Resource Person: Mr. Prem Kumar J, a seasoned Product Manager at Capricot Technologies.

Event Description:

The Faculty Development Program (FDP) titled "Engineering Research Application of Artificial Intelligence (AI) Machine Learning (ML) and Internet of Things (IoT) using MATLAB" was conducted from 20th November to 24th November 2023. The program aimed to enhance faculty members, research scholars and students' skills and knowledge in algorithm development, dynamic system modelling, signal processing, image processing, machine learning, deep learning, transfer learning, Python integration, and hardware support using MATLAB and Simulink. The resource person for the FDP was Mr. Prem Kumar J, a seasoned Product Manager at Capricot Technologies. The event was inaugurated by Dr. P. Ramanathan, Vice-Principal (Academics) and encouraged the participants to learn MATLAB tools for research and development. Dr. S. Rajasekaran. Professor and Head of the Department of Electronics & Communication Engineering appreciated the participation of FDP and advice to complete MATLAB Onramp Certification.

Day-wise Overview:

Day 1, 20th November 2023: Algorithm Development with MATLAB and Dynamic System Modelling with Simulink

The program commenced with a ceremonial opening on Day 1, where Dr. Kumar C introduced the sponsors and welcomed Mr. Prem Kumar J. The Vice Principal of MITS addressed the participants, emphasizing the significance of MATLAB in engineering and technology. Dr. S. Rajasekaran, Head of the Electronics & Communication Engineering Department, provided insights into the event's importance. Mr Prem Kumar J covered Algorithm Development with MATLAB in the forenoon session and Dynamic System Modelling with Simulink in the afternoon. The session featured intriguing discussions with introspective question-and-answer sessions among all the participants and the instructor.

Day 2, 21st November 2023: Signal Processing with MATLAB and Image Processing and Computer Vision with MATLAB and Simulink

The FDP continued with Signal Processing covered in the forenoon and Image Processing and Computer Vision in the afternoon. The highly interactive sessions allowed participants to grasp the theoretical foundations and practical applications of these essential MATLAB concepts. The instructor covered several practical examples and applications of signal and image processing, followed by small interactive tasks to give the audience a feel for hands-on experience.

Day 3, 22nd November 2023: Machine Learning and Deep Learning with MATLAB

Day 3 focused on the rapidly evolving fields of Machine Learning and Deep Learning using MATLAB. Mr. Prem Kumar J delved into the intricacies of these advanced topics, providing participants with a comprehensive understanding of their applications in engineering and technology. Various ML and AI algorithms were discussed using the respective MATLAB toolbox.

Day 4, 23rd November 2023: Transfer Learning and Python Integration with MATLAB and Discussion on MATLAB Onramp Certificate

The forenoon session of Day 4 explored Transfer Learning and Python Integration with MATLAB. The afternoon session included a valuable discussion on the MATLAB Onramp Certificate, addressing queries and providing insights into certification benefits and requirements. The participants got ample time to finish the requirements for the certificates and discuss their doubts with the instructor.

Day 5, 24th November: Hardware Support with MATLAB and Simulink and MATLAB and Simulink for IoT Applications

The final day of the FDP covered Hardware Support with MATLAB and Simulink in the forenoon and concluded with MATLAB and Simulink for IoT Applications in the afternoon. These sessions equipped participants with the skills necessary for integrating MATLAB and Simulink into hardware-centric and Internet of Things (IoT) applications.

Valedictory Ceremony:

As part of the FDP, the participants submitted their MATLAB Onramp Certificate. Following the completion of all sessions, a valedictory ceremony took place on Day 5. Dr. K. Sathesh and Dr. P. Ramanathan were present at the ceremony. The event provided ample opportunities for participants to express their gratitude and share their insights gained during the FDP. Dr. Kumar C shared the event's highlights with the dignitaries and participants. After that, Dr. Sourav Ghosh shared a vote of thanks to end the program. Certificates of participation were distributed to acknowledge the active involvement of the faculty members.

Conclusion:

The Faculty Development Program on "Engineering Research Application of Artificial Intelligence (AI) Machine Learning (ML) and Internet of Things (IoT) using MATLAB " proved to be a resounding success. Participants gained in-depth knowledge and practical skills, empowering them to integrate MATLAB and Simulink effectively into their teaching and research activities. The FDP enhanced participants' expertise and fostered a collaborative learning environment, contributing to the institution's overall academic excellence.

Outcome:

1.Enhanced Research Competence:

Participants in the FDP acquired skills and knowledge in the application of Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT) using MATLAB. This heightened competence will enable faculty members to engage in cutting-edge research and contribute to advancing engineering disciplines.

2.Curriculum Enrichment:

The FDP empowered faculty members to integrate MATLAB into their teaching curricula for contemporary applications. This integration will ensure that students are exposed to the most up-to-date tools and methodologies, preparing them for the rapidly evolving landscape of engineering research and industry applications.

3.Research Output and Publications:

The FDP's focus on hands-on training and practical applications using MATLAB will equip faculty members with the skills to conduct impactful research. As a result, the program is expected to increase the quantity and quality of research output, leading to more publications in reputable journals and conferences.

4. Industry-Relevant Skill Development:

The integration of MATLAB aligns with industry practices, as MATLAB is widely used in engineering and technology sectors. Faculty members gained industry-relevant skills, enhancing their ability to collaborate with industry partners, contribute to real-world projects, and prepare students for careers in AI, ML, and IoT-based applications in engineering.