Value-Added Course on Computer Vision

Report

Module Number: 08

Key Topics Covered: Object Detection using Classical Methods and Haar Cascades HOG+SVM

Resource Person(s): Mrs. Anusha Manda and Mr. Bheemana Bhuvan

Date and Time of Session: 19.11.2025 and 10.00am to 01.00pm Duration: 3 hours

**Mode of Delivery:** Face to Face Lecture Delivery

Target Audience: 2nd, 3rd and 4th year students

Number of Participants: 45

Venue: A-403 Classroom

Objectives of the Course Module:

- Introducing traditional (pre-deep-learning) object detection techniques
- Understand how image features, pattern recognition, and machine learning classifiers were used before CNN
- Understand the cascade structure for efficient real-time detection
- Recognize common applications like face detection
- Train an SVM classifier to detect objects based on extracted HOG features
- Explore the popular Dalal–Triggs pedestrian detection pipeline
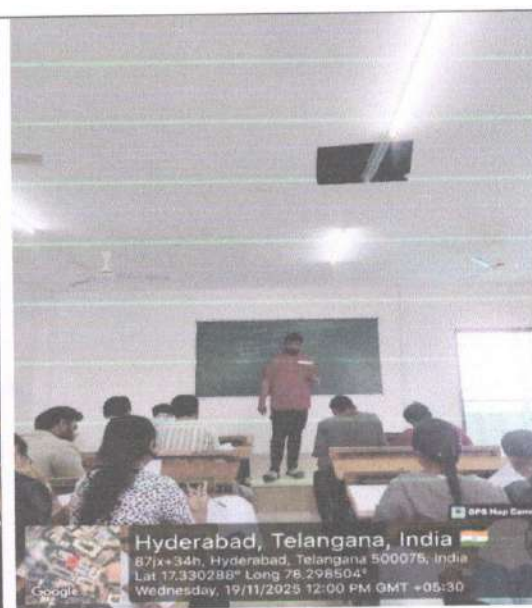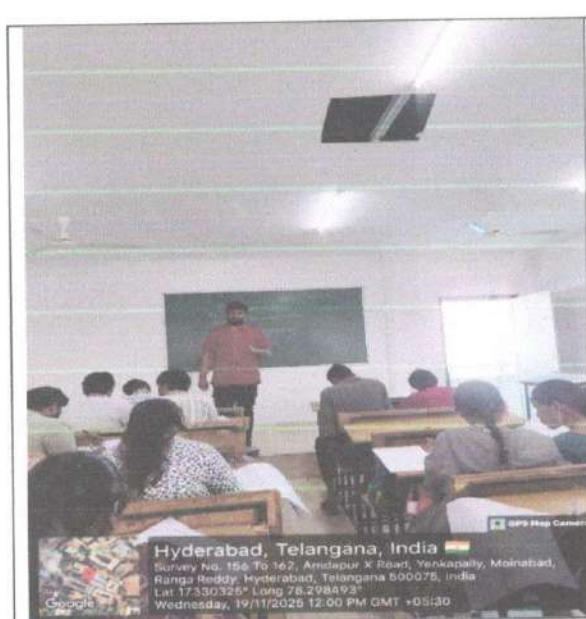
Session conducted on a Value-Added Course on Computer Vision for 2nd, 3rd and 4th year students of ECM on 19.11.2025

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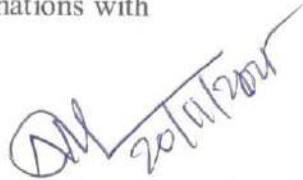### Department of Electronics and Computer Engineering

Expected Learning Outcomes of the Module: 08

By the end of the module, students could:

- Implement simple classical detectors and understand their computational challenges
- Evaluate performance and limitations of classical techniques in real-world applications
- Train a Haar Cascade for a simple object (e.g., face, eye, license plate)
- Implement and use OpenCV's Haar Cascade detectors in practice
- Train an SVM classifier to distinguish between object and non-object patches
- Build a sliding-window HOG+SVM detection system
- Evaluate detector accuracy and understand limitations in scale change, occlusion, and real-time performance

Summary:

Students appreciated the practical, project-based learning approach, clear explanations with industry relevance and real-time demonstrations and coding practice

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