Value-Added Course on Computer Vision

Report

Module Number: 09

Key Topics Covered: Introduction to Deep Learning for CV, Neural Networks and CNN basics

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

Date and Time of Session: 21.11.2025 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: 51

Venue: A-403 Classroom

Objectives of the Course Module:

- Presenting real-world applications such as image classification, object detection, segmentation, and recognition
- Building an understanding of the computational requirements and frameworks (TensorFlow, PyTorch)
- Teaching forward propagation and backpropagation for training.
- Understanding the architecture of classic CNN models (LeNet, AlexNet, VGG).
- Demonstrating how CNNs outperform dense networks in image-based tasks.

Session conducted on a Value-Added Course on Computer Vision for 2nd, 3rd and 4th year students of ECM on 21.11.2025

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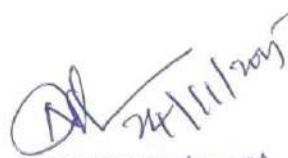## Department of Electronics and Computer Engineering

Expected Learning Outcomes of the Module: 09

By the end of the module, students could:

- Compare deep learning to classical CV methods (HOG, SVM, Haar Cascades).
- Identify major applications and understand where deep learning is most beneficial.
- Set up basic deep learning environments and understand GPU requirements.
- Train a simple neural network for tasks like digit classification (MNIST).
- Identify and address issues such as overfitting and vanishing gradients.
- Evaluate CNN performance and understand trade-offs such as depth, receptive field, and parameter count.
- Recognize challenges like overfitting and computational cost and select techniques to address them (data augmentation, regularization).

Summary:

Students appreciated the practical, project-based learning approach, clear explanations with

industry relevance and real-time demonstrations and coding practice

Head of Department

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