**Session 2025-2026**

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| **Vision:** Dream of where you want. | **Mission:** Means to achieve Vision |

**Program Educational Objectives of the program (PEO):** (broad statements that describe the professional and career accomplishments)

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| PEO1 | **Preparation** | **P: Preparation** | **Pep-CL abbreviation**  **pronounce as Pep-si-lL easy to recall** |
| PEO2 | **Core Competence** | **E: Environment (Learning Environment)** |
| PEO3 | **Breadth** | **P: Professionalism** |
| PEO4 | **Professionalism** | **C: Core Competence** |
| PEO5 | **Learning Environment** | **L: Breadth (Learning in diverse areas)** |

**Program Outcomes (PO):** (statements that describe what a student should be able to do and know by the end of a program)

**Keywords of POs:**

Engineering knowledge, Problem analysis, Design/development of solutions, Conduct Investigations of Complex Problems, Engineering Tool Usage, The Engineer and The World, Ethics, Individual and Collaborative Team work, Communication, Project Management and Finance, Life-Long Learning

**PSO Keywords:** Cutting edge technologies, Research

“I am an engineer, and I know how to apply engineering knowledge to investigate, analyse and design solutions to complex problems using tools for entire world following all ethics in a collaborative way with proper management skills throughout my life.” *to contribute to the development of cutting-edge technologies and Research*.

**Integrity:** I will adhere to the Laboratory Code of Conduct and ethics in its entirety.

**Name and Signature of Student and Date**

**Krishna Mishra**

(Signature and Date in Handwritten)

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| **Session** | **2025-26 (EVEN)** | | **Course Name** | Computer vision Lab | |
| **Semester** | **6th** | | **Course Code** | **23ADS1602** | |
| **Roll No** | **42** | | **Name of Student** | **Krishna Mishra** | |
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| Practical Number | | **05** | | | |
| Course Outcome | | CO1 Apply image enhancement and smoothing techniques to improve image quality for further analysis.  CO2 Extract meaningful features from images using descriptors such as HOG and SIFT. | | | |
| Aim | | Implement object detection algorithm YOLO. | | | |
| Problem Definition | | The objective is to implement an object detection system that automatically identifies and locates multiple objects in an input image using the YOLO (You Only Look Once) algorithm. The system should draw bounding boxes around detected objects and label them with class names and confidence scores. | | | |
| Theory  (100 words) | | YOLO (You Only Look Once) is a deep learning based real-time object detection algorithm. Unlike traditional methods that perform detection in multiple stages, YOLO uses a single convolutional neural network to predict bounding boxes and class probabilities simultaneously. The image is divided into grid cells, and each cell predicts objects with confidence scores. Because detection happens in one forward pass, YOLO is extremely fast and suitable for realtime applications. It provides good accuracy while maintaining high speed. YOLO is widely used in surveillance, traffic monitoring, autonomous vehicles, and security systems. | | | |
| Procedure and Execution  (100 Words) | | Algorithm:  Step 1:Install the Ultralytics YOLO library.  Step 2:Upload the input image.  Step 3:Load pretrained YOLO model.  Step 4:Read image using OpenCV.  Step 5:Run object detection using model.  Step 6:Draw bounding boxes and labels.  Step 7:Display the detected output. | | | |
| Code:  from ultralytics import YOLO  import cv2  import matplotlib.pyplot as plt  # load pre trained YOLO model  model = YOLO('yolov8n.pt')  #load input  image = cv2.imread(‘RohitSharma.jpg’)  # Check if image loaded successfully  if image is None:  raise FileNotFoundError(f"Error: Image not found at {image\_path}. Please ensure the image file is uploaded to Colab.")  image\_rgb = cv2.cvtColor(image,cv2.COLOR\_BGR2RGB)  # Display original image  plt.figure(figsize=(6, 6))  plt.imshow(image\_rgb)  plt.title("Original Image")  plt.axis("off")  plt.show()  results = model(image\_rgb)  annotated\_image = results[0].plot()  plt.figure(figsize=(10, 8))  plt.imshow(annotated\_image)  plt.title("YOLO Object Detection")  plt.axis("off")  plt.show() | | | |
| Output: | | | |
| Output Analysis | | After applying the YOLO object detection algorithm to the input image, the system successfully detects multiple objects present in the scene such as vehicles, pedestrians, and traffic elements. Bounding boxes are drawn around each detected object along with class labels and confidence scores. The confidence value indicates the probability of correct detection. Objects are detected simultaneously in a single pass, resulting in fast and efficient performance. The model accurately localizes objects even when they vary in size and position. Hence, YOLO provides real-time detection with good accuracy and minimal processing time. | | | |
| Link of student Github profile where lab assignment has been uploaded | | [krish-na45/ComputerVision\_Practicals](https://github.com/krish-na45/ComputerVision_Practicals) | | | |
| Conclusion | | The YOLO algorithm was successfully implemented for object detection. The model accurately detected multiple objects and displayed bounding boxes with labels. YOLO provides high speed and good accuracy, making it suitable for real-time applications such as traffic monitoring, surveillance, and autonomous systems. Hence, YOLO is an efficient and reliable object detection technique. | | | |
| Plag Report (Similarity index < 12%) | |  | | | |
| Date | | **19-02-2026** | | | |