Nagar Yuwak Shikshan Sanstha's
Yeshwantrao Chavan College of Engineering
(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
Hingna Road, Wanadongri,
Nagpur - 441 110 NAAC A++

Department of Computer Technology

Vision of the Department

To be a well-known centre for pursuing computer education through innovative pedagogy, value-based education and industry collaboration.

Mission of the Department

To establish learning ambience for ushering in computer engineering professionals in core and multidisciplinary area by developing Problem-solving skills through emerging technologies.

Session 2025-2026

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)

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)

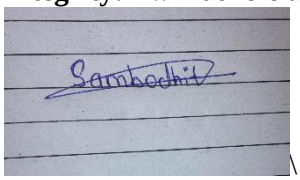
Keywords of POs:

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

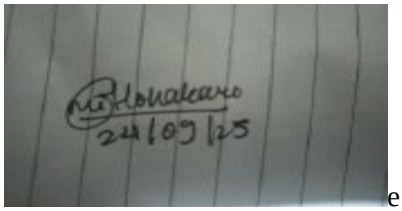
PSO Keywords: Cutting edge technologies, Research

"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.



Sambodhit Chavhan



Signature of Teacher and Date

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Session	**2025-26 (ODD)**	**Course Name**	**Computer vision Lab**
Semester	**5**	**Course Code**	**CT**
Roll No	**70**	**Name of Student**	**Sambodhit Chvahn**

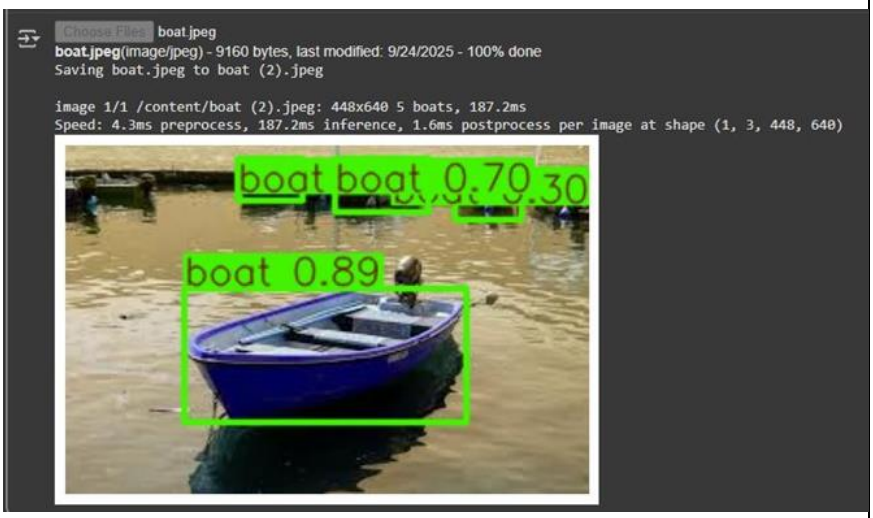
Practical Number	**5**
Course Outcome	**Upon successful completion of the course the students will be able to** 1. Apply image enhancement and smoothing techniques to improve image quality for further analysis. 2. Extract meaningful features from images using descriptors such as HOG and SIFT. 3. Implement and evaluate modern object detection methods including YOLO and R-CNN. 4. Analyze and develop solutions for motion estimation, object recognition, and facial expression recognition using classical and learning-based methods.
Aim	The aim of this project is to implement an object detection system using the YOLO (You Only Look Once) algorithm that can accurately identify and locate multiple objects in images or video streams in real time.
Problem Definition	Write a Program To Apply **YOLO** On Input Image.
Theory (100 words)	YOLO, which stands for *You Only Look Once*, is a popular object detection method used in computer vision. Unlike older methods that check many parts of an image separately, YOLO looks at the whole image in a single pass using a Convolutional Neural Network (CNN). The image is divided into a grid, and each cell predicts bounding boxes, confidence scores, and class probabilities for objects whose center is inside the cell. After prediction, Non- Max Suppression removes overlapping boxes, keeping only the best ones.

Procedure and Execution (100 Words)	Algorithm: ● · **Look at the whole image at once:** ● YOLO does not scan an image piece by piece. Instead, it processes the entire image in a single pass. ● · **Divide the image into a grid:** ● The image is split into small cells. Each cell is responsible for detecting objects whose centers lie inside it. ● · **Each cell predicts:** ● **-Bounding boxes**: The location and size of objects. ● **-Confidence score**: How likely the box contains an object. ● **-Class probabilities**: What type of object it is (person, car, dog, etc.). ● · **Combine predictions:** ● All predictions from all grid cells are collected at once. ● · **Remove overlaps:** ● Using **Non-Max Suppression**, overlapping boxes are removed, keeping only the most confident ones. ● · **Final output:** ● You get bounding boxes with labels and confidence scores for every object in the image — fast and accurate

Code:

```
import cv2
import matplotlib.pyplot as
plt import torch
from ultralytics import
YOLO from google.colab
import files
model =


YOLO("yolov8n.pt")


uploaded = files.upload()



image_path = list(uploaded.keys())[0]



results = model(image_path)


plt.imshow(results[0].plot())
plt.axis('off')
plt.show()
```

Output:



Output Analysis	When YOLO runs on an image, it detects all objects in a single pass and outputs **bounding boxes, class labels, and confidence scores** for each detected object. The bounding boxes show the location and size of objects, the class labels identify what each object is, and confidence scores indicate how sure the model is about each detection.

Link of student Github profile where lab assignment has	https://github.com/sambodhit-chavhan/CV-

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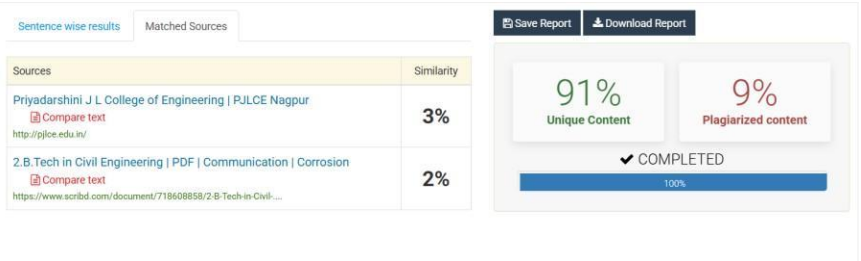
been uploaded	
Conclusion	The SIFT algorithm is effective in identifying distinctive and stable keypoints from an image. The experiment demonstrates that SIFT features are scale and rotation invariant, making them highly reliable for computer vision tasks. Thus, SIFT plays a crucial role in applications like object detection, image stitching, and robot navigation due to its robustness and accuracy.
Plag Report (Similarity index < 12%)	
Date	30/08/25