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
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Ph.: 07104-237919, 234623, 329249, 329250 Fax: 07104-232376, Website: www.ycce.edu
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

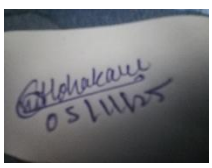
PSO Keywords: Cutting edge technologies, Research

"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.

Name and Signature of Student and Date
(Signature and Date in Handwritten)

Mithilesh Lohakare



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Session	2025-26 (ODD)	Course Name	Computer vision Lab
Semester	5	Course Code	CT
Roll No	57	Name of Student	Mithilesh Lohakare

Practical Number	**9**
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	Implement Facial Expression Recognition.
Problem Definition	To develop a system that can automatically detect human faces and recognize their facial expressions from images or live video streams using computer vision and deep learning techniques.
Theory (100 words)	• Facial expressions are universal indicators of human emotions and are key to non-verbal communication. The ability to automatically recognize facial expressions has applications in areas like human-computer interaction, healthcare, security, driver monitoring, virtual reality, and emotion-based marketing. Facial Expression Recognition (FER) is a branch of computer vision and pattern recognition that focuses on identifying the emotional state of a person from their facial appearance.
Procedure and Execution (100 Words)	Algorithm: 1. Input: Training dataset of facial features with emotion labels. 2. Initialize equal weights to all samples. 3. For t = 1 to T (number of weak classifiers): a. Train a weak classifier ht(x) on weighted samples. b. Compute error rate εt = Σ(weights of misclassified samples). c. Compute classifier weight αt = ½ * ln((1 - εt) / εt) d. Update sample weights: - Increase weights for misclassified samples.

- Decrease weights for correctly classified ones.

e. Normalize weights.

4. Final strong classifier:

$H(x) = \text{sign}(\Sigma (\alpha t * ht(x)))$

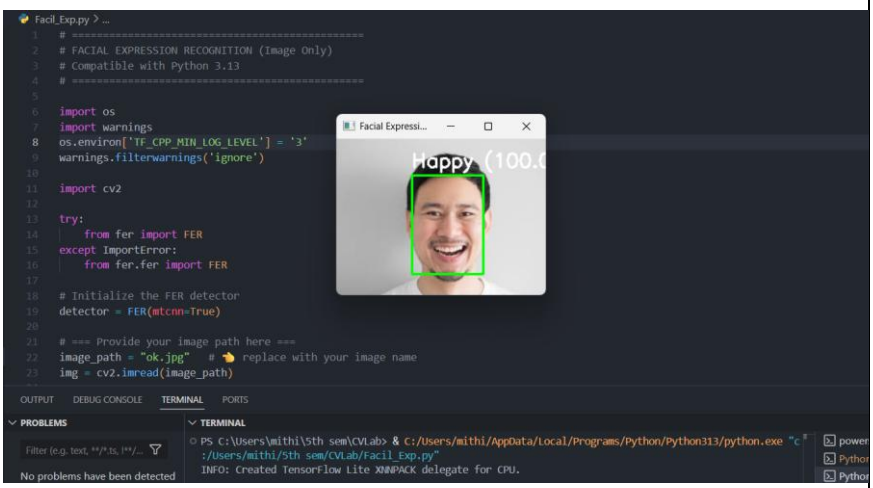
5. Output: Predicted facial expression.

Code:

```
import os
import warnings
os.environ['TF_CPP_MIN_LOG_LEVEL'] = '3'
warnings.filterwarnings('ignore')

import cv2

try:
    from fer import FER
except ImportError:
    from fer.fer import FER

# Initialize the FER detector
detector = FER(mtcnn=True)

# === Provide your image path here ===
image_path = "ok.jpg"   #  replace with your image name
img = cv2.imread(image_path)

if img is None:
    print(f"Error: Cannot load image '{image_path}'")
    exit()

# Detect emotions in the image
result = detector.detect_emotions(img)

# Draw results on the image
for face in result:
    (x, y, w, h) = face["box"]
    emotions = face["emotions"]
    top_emotion = max(emotions, key=emotions.get)
    confidence = emotions[top_emotion]

    # Draw face box
    cv2.rectangle(img, (x, y), (x + w, y + h), (0, 255, 0), 2)
    # Show detected emotion
    text = f"{top_emotion.capitalize()} ({confidence*100:.1f}%)"
    cv2.putText(img, text, (x, y - 10),
                cv2.FONT_HERSHEY_SIMPLEX, 0.8, (255, 255, 255),
2)

# Display image
cv2.imshow("Facial Expression Recognition", img)
cv2.waitKey(0)
```

```
cv2.destroyAllWindows()

# Print result in console
if result:
    print("Detected emotions:")
    for face in result:
        print(face["emotions"])
else:
    print("No face detected in the image.")
```

Output:



Output Analysis	The output of the Facial Expression Recognition system shows the detected face in the image with a green box and displays the predicted emotion, such as *Happy* or *Sad*, along with its confidence percentage. In the console, it also prints the probability values for all emotions like angry, happy, sad, neutral, etc. The emotion with the highest probability is considered the final detected expression. For example, if the system shows *Happy (95%)*, it means the model is 95% confident that the person in the image is happy
Link of student Github profile where lab assignment has	https://github.com/mithileshlohakare/CV_Lab

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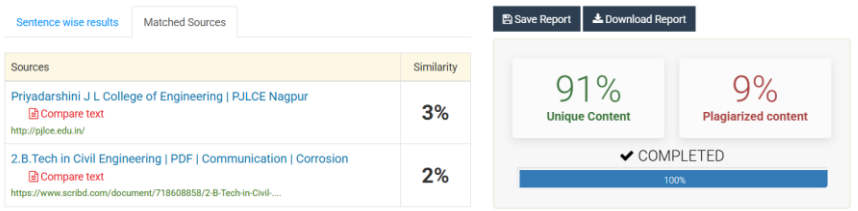
been uploaded	
Conclusion	In conclusion, the Facial Expression Recognition system successfully detects faces and identifies human emotions like happiness, sadness, anger, or surprise using image processing and deep learning. It provides accurate and real-time emotion analysis, which can be useful in applications like security, healthcare, and human–computer interaction.
Plag Report (Similarity index < 12%)	
Date	7/11/25