

# **VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

JNANA SANGAMA CAMPUS, BELGAVI-590018



**A PROJECT REPORT**

**ON**

## **“FACIAL EMOTION DETECTION USING OPENCV AND CNN”**

**Submitted in partial fulfilment of the award of degree in**

**BACHELOR OF ENGINEERING**

**IN**

**INFORMATION SCIENCE & ENGINEERING**

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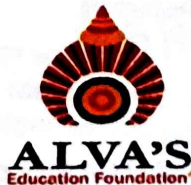
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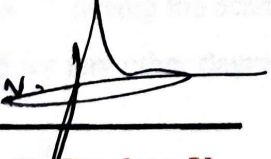
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**CERTIFICATE**

This is to certify that the Project entitled **"Facial Emotion Detection using OpenCV and CNN"** has been successfully completed by

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the bonafide students of the **Information Science & Engineering Department, Alva's Institute of Engineering and Technology, Moodubidire**, in partial fulfillment of **8<sup>th</sup> Semester, BACHELOR OF ENGINEERING**, affiliated to **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**, during the year **2023-2024**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirements in respect of Project Work Phase-2 -18CSP83 prescribed for the Bachelor of Engineering Degree.

  
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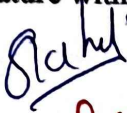

  
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## ABSTRACT

Facial emotion detection is a challenging task in computer vision, which has the potential to revolutionize the way we interact with computers and with each other. In this project, we discuss the methodology in facial emotion detection using machine learning, OpenCV, and CNNs. We also provide a comparative analysis of different methods and discuss the challenges and limitations of the current state-of-the-art. Facial emotion detection has become a crucial component in human-computer interaction and affective computing applications. This project shows a comprehensive approach to facial emotion detection, leveraging the synergy between OpenCV, a powerful computer vision library, and Convolutional Neural Networks (CNNs), a state-of-the-art deep learning technique. Our methodology involves preprocessing facial images using OpenCV for feature extraction, followed by a CNN model trained on a diverse dataset for accurate emotion classification.

The first stage of our approach utilizes OpenCV to detect and extract facial features, including key points and expressions, from input images. This preprocessing step ensures robust feature representation, capturing both global and local facial cues. Subsequently, a CNN model is employed to learn hierarchical features and patterns directly from the facial images. The CNN is trained on a carefully curated dataset encompassing a wide range of facial expressions, ensuring the model's ability to generalize to various emotional states.

We have conducted rigorous experiments to evaluate the performance of our approach, comparing it with existing methods on standard benchmark datasets. The results demonstrated the effectiveness of our integrated approach in achieving high accuracy and robustness in facial emotion recognition tasks.