VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590018

Mini Project Report

On

"Enhancing Visual Data Through Advanced Image Processing Techniques Using OpenCV"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

Submitted by

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CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"Enhancing Visual Data Through Advanced Image Processing Techniques Using OpenCV"** has been completed by

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The Bonafide students of the **Department of Computer Science & Design, Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & DESIGN** of the **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 Mini Project report has been approved as it satisfies the academic requirements concerning the Mini Project work of Computer Graphics and Image Processing subject prescribed for the Bachelor of Engineering Degree.

Dr. Pushparani M K
Mini Project Guide

Prof. Jayantkumar A Rathod
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ABSTRACT

Image processing is a pivotal field within computer science and engineering that focuses on the manipulation and analysis of visual data to enhance image quality, extract meaningful information, or transform images for various applications. This project aims to demonstrate the practical implementation of several fundamental image processing techniques using OpenCV, an open-source computer vision and machine learning library. By converting images into pencil sketches, performing morphological operations, creating negative images, converting to grayscale, and applying cartoon effects, the project showcases the versatility and power of OpenCV in transforming visual data. Through a structured methodology encompassing requirement analysis, literature review, algorithm design, implementation, testing, and validation, this project highlights how these techniques can be applied effectively across diverse domains such as healthcare, security, automotive, retail, robotics, and entertainment. The project also emphasizes the importance of a user-friendly interface to facilitate interaction with the image processing functions. Overall, this project underscores the critical role of image processing in modern digital technology, providing a comprehensive understanding of essential techniques and their practical applications, with potential for future enhancements through advanced machine learning models and real-time optimization.