VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590018

Mini Project Report

On

"DETECTION OF FRACTURE IN HAND USING IMAGE PROCESSING"

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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Under the Guidance of

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DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY MIJAR,

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CERTIFICATE

This is to certify that the Computer Graphics and Image Processing Laboratory with Mini Project entitled **"DETECTION OF FRACTURE IN HAND USING IMAGE PROCESSING"** has been completed by

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The Bonafide student 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.

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ABSTRACT

The detection of fractures in hand X-ray images is a critical task in the medical field, often requiring expert radiologists to perform detailed analyses. This project aims to develop an automated system for detecting fractures using image processing techniques and machine learning algorithms. The proposed system enhances X-ray images, extracts relevant features, and applies machine learning models to identify potential fractures. By automating the detection process, the system assists medical professionals in making quicker and more accurate diagnoses, ultimately improving patient outcomes.

The implementation leverages Python programming along with libraries such as OpenCV, PIL, and TensorFlow. The system architecture includes components for image acquisition, pre-processing, feature extraction, fracture detection, and result visualization. Techniques such as histogram equalization, noise reduction, edge detection, and image segmentation are employed to process the images effectively.

The project demonstrates high accuracy in detecting fractures when tested with a dataset of hand X-ray images, showing significant potential for reducing diagnostic time and improving consistency. Future enhancements could include integration with hospital information systems, expansion to other types of fractures, and the application of advanced deep learning techniques to further improve detection performance.

In conclusion, this project provides a robust and efficient solution for fracture detection in hand X-ray images, showcasing the power of image processing and machine learning in medical diagnostics.