VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI-590018

Mini Project Report On

"KIDNEY STONE DETECTION AND LENGTH MEASUREMENT"

A report submitted in partial fulfillment of the requirements for

COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY (21CSL66)

In

Computer Science and Design

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CERTIFICATE

This is to certify that the CGIP Mini Project entitled **"KIDNEY STONE DETECTION AND LENGTH MEASUREMENT"** has been successfullycompleted by

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the bonafede students of **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 in respect of Mini Project work prescribed for the Bachelor of Engineering Degree.

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Mini Project Guide

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ABSTRACT

Kidney stones represent a prevalent and serious health issue requiring precise diagnostic tools for effective management. This project introduces an innovative image processing framework implemented in MATLAB for automated detection and accurate measurement of kidney stones. The system employs advanced techniques such as image preprocessing, segmentation, and morphological operations to isolate stones from medical images. Pixel calibration ensures measurements are translated into real-world millimetres, essential for clinical assessments. A user-friendly graphical interface facilitates intuitive image uploading, processing, and visualization of diagnostic results.

Machine learning algorithms enhance detection accuracy by adapting to varying stone characteristics encountered in patient data. The integration of these technologies aims to streamline diagnostic workflows, optimize treatment planning, and ultimately improve patient outcomes in nephrology practice. By automating these critical tasks, the system not only enhances diagnostic precision but also reduces human error and accelerates the decision-making process in clinical settings.

This research contributes to advancing medical imaging technologies, paving the way for more efficient and accurate kidney stone diagnosis and treatment. The project's outcomes promise to significantly benefit healthcare professionals by providing reliable tools to enhance clinical efficiency and patient care.