

# ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Unit of Alva's Education Foundation ®, Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by AICTE, New Delhi, Recognized by Government of Karnataka.

**Accredited by NACC with A+ Grade**

Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka

## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

### CERTIFICATE

This is to certify that the Mini Project entitled **“HISTOGRAM EQUALIZATION: ENHANCING COLOR IMAGES”** has been successfully completed and report submitted in A.Y 2024-25. It is certified that all corrections/suggestions indicated Presentation session have been incorporated in the report and deposited in the department library.

The assignment was evaluated and group members marks as indicated below

SI	USN	NAME	Presentation Skill (5)	Report (15)	Subject Knowledge (3)	Question and Answer (2)	Total Marks (25M)
1	4AL21AI025	NIKHITHA H R					
2	4AL21AI032	PRATHIKSHA E					
3	4AL21AI045	SHETTY CHINTAN ASHOK					
4	4AL21AI051	SUMANTH N					

**Dr. Ganesh K**

Professor

## ACKNOWLEDGEMENT

The satisfaction and euphoria that accompany a successful completion of any task would be incomplete without the mention of the people who made it possible, success is the epitome of hardwork and perseverance, but steadfast of all is encouraging guidance.

So, with gratitude, we acknowledge all those whose guidance and encouragement served as a beacon of light and crowned the effort with success.

The selection of this mini-project work as well as the timely completion is mainly due to the interest and persuasion of our Project guide **Dr. Ganesh K**, Professor, Department of Artificial Intelligence & Machine Learning. We will remember his contribution forever.

We sincerely thank, **Prof. Harish Kunder**, Associate Professor and Head of the Department of Artificial Intelligence & Machine Learning who has been the constant driving force behind the completion of the project.

We thank our beloved Principal, **Dr. Peter Fernandes**, for his constant help and support throughout.

We are indebted to the **Management of Alva's Institute of Engineering and Technology, Mijar, Moodbidri** for providing an environment which helped us in completing our mini project.

Also, we thank all the teaching and non-teaching staff of Department of Artificial Intelligence & Machine Learning for the help rendered.

<b>NIKHITHA H R</b>	<b>4AL21AI025</b>
<b>PRATHIKSHA E</b>	<b>4AL21AI032</b>
<b>SHETTY CHINTAN ASHOK</b>	<b>4AL21AI045</b>
<b>SUMANTH N</b>	<b>4AL21AI051</b>

## **ABSTRACT**

This report details the implementation of Histogram Equalization (HE) for enhancing the contrast and visual quality of grayscale images using the Scilab programming environment. The project aims to develop a robust and efficient system for HE, addressing challenges like noise amplification and over-enhancement while maintaining the naturalness of the enhanced images. The report outlines the methodology, including image loading, histogram calculation, normalization, CDF generation, scaling, pixel mapping, and visualization of results. The effectiveness of HE is demonstrated through visual comparisons of the original and enhanced images and their corresponding histograms, validating the accuracy and utility of the implemented method. The project also emphasizes the importance of preprocessing in image enhancement, the value of visual validation, and the improvement of Scilab programming skills.

# TABLE OF CONTENTS

CHAPTER NO.	DESCRIPTION	PAGE NO.
1	INTRODUCTION	1-2
1.1	Background	1
1.2	Problem Statement	1
1.3	Objectives	1
1.4	Scope	3
2	OBJECTIVE	4-6
3	METHODOLOGY	4
3.1	Loading the Input Image	4
3.2	Computing the Histogram	4
3.3	Normalizing the Histogram	4
3.4	Generating the Cumulative Distribution Function (CDF)	4
3.5	Scaling the CDF to 0–255 Range	5
3.6	Mapping Pixels to New Intensity Values	5
3.7	Visualizing the Results	5
3.8	Documentation and Reporting	5
4	RESULTS	7-9
4.1	Display of results for image enhancement.	7
5	CONCLUSION	10

## LIST OF FIGURES

FIGURE NO.	DESCRIPTION	PAGE NO.
7.1	Input image	8
7.2	Output image	8
7.3	Combined	9