

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI – 590018**



Project Report on
“Deep Learning – Based Object Detection System Using YOLO
Algorithm”

BACHELOR OF ENGINEERING
IN
INFORMATION SCIENCE AND ENGINEERING

Subject: ARTIFICIAL INTELLIGENCE [BIS515B]

Submitted By:

Mohammed Sinan [4JK22IS032]

Mohammed Shiban [4JK22IS033]

Mohammed Faheem [4JK22IS034]

Mohammed Irfan [4JK22IS035]

Under the guidance of

Prof. USHA C S

Assistant Professor

Department of Computer Science & Engineering



DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

A. J. INSTITUTE OF ENGINEERING & TECHNOLOGY NH-

66, KOTTARA CHOWKI, MANGALURU – 575006

2024 - 2025

A. J. INSTITUTE OF ENGINEERING & TECHNOLOGY

NH – 66, Kottara Chowki, Mangaluru - 575006

A Unit of Laxmi Memorial Education Trust (R)

(Affiliated to Visvesvaraya Technological University, Belagavi & Approved by AICTE, New Delhi)

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING



CERTIFICATE

Certified for the assignment work entitled **“Deep Learning – Based Object Detection System Using YOLO Algorithm”** carried out by **Mr. MOHAMMED SINAN (4JK22IS032), Mr. MOHAMMED SHIBAN (4JK22IS033), Mr. MOHAMMED FAHEEM (4JK22IS034), Mr. MOHAMMED IRFAN (4JK22IS035)**, bonafide students of A.J. Institute of Engineering & Technology, Mangaluru, in partial fulfillment for the award of **Bachelor of Engineering in Information Science and Engineering** of **Visvesvaraya Technological University, Belagavi** during the year 2024-2025. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library.

The report has been approved as it satisfies the academic requirements in respect of Work prescribed for the said Degree.

Prof. USHA C S

Assistant Professor

Dr. John P Veigas

**Head of the
Department**

ACKNOWLEDGEMENT

The joy and satisfaction that accompany the successful completion of any task would be incomplete without the mention of the people who made it possible.

We would like to express our gratitude to our **Principal, Dr. Shantharama Rai C** for providing us a congenial environment for engineering studies and also for guiding us to carry out the project.

We consider it a privilege to express our sincere thanks to **Dr. John P Veigas** , Professor and Head, Department of Information Science and Engineering for her support and valuable guidance throughout the tenure of this project.

We would like to thank our Guide **Prof Usha C S**, Professor, Department of Computer Science and Engineering for her support, guidance, motivation, encouragement for the successful completion of this project.

We intend to thank all the teaching and non-teaching staff of our Department of Information Science and Engineering for their immense help and co- operation.

Finally, we would like to express our gratitude to our parents and friends who always stood by us.

Mohammed Sinan	[4JK22IS032]
Mohammed Shiban	[4JK22IS033]
Mohammed Faheem	[4JK22IS034]
Mohammed Irfan	[4JK22IS035]

ABSTRACT

The Deep Learning-Based Object Detection System is an advanced solution designed to detect and classify objects in real-time. Powered by the state-of-the-art YOLO (You Only Look Once) algorithm, this system is capable of analyzing images and videos with exceptional speed and precision. By leveraging deep learning technologies, it efficiently identifies and distinguishes between various objects, making it highly useful for applications like agriculture, surveillance, robotics, and autonomous systems.

This project is specifically trained to detect and classify objects such as "crops" and "weeds", providing critical insights for applications like smart farming. The system processes visual data through a deep neural network, identifying objects and drawing bounding boxes around them with high confidence. Its intuitive design and robust performance make it accessible and practical for diverse use cases.

The purpose of this system is to simplify object detection tasks and enhance automation in various industries. Whether it's optimizing agricultural productivity, improving safety in automated systems, or enabling efficient surveillance, this system demonstrates how deep learning can transform traditional workflows. With its ability to provide reliable and actionable insights, the Deep Learning-Based Object Detection System Using YOLO Algorithm is a powerful tool for innovation and practical problem-solving.

TABLE OF CONTENT

S.No	TITLE	PAGE
	List of figures	i
1	Introduction	1
1.1	Objectives of the Project	2
1.2	Significance of the project	3
2	Software Requirement Specification	4
2.1	Introduction	4
2.2	Purpose	4
2.3	Scope	4
2.4	Specific Requirements	5
2.4.1	Hardware Requirements	5
2.4.2	Software Requirements	6
3	Design and Implementation	7
3.1	System Design	7
3.1.1	Flowchart	7
3.1.2	Sequence diagram	8
3.1.3	Class diagram	9
3.2	Modules with description	10
3.2.1	YOLO Network Initialization Module	10
3.2.2	Web Cam Capture Module	10
3.2.3	Frame Pre-Processing Module	10
3.2.4	Object Detection Processing Module	11

3.2.5	Non-Maximum Suppression Module	11
4	Result and Conclusion	12
4.1	Snapshot with description	12
	Conclusion	14
	Future Enhancement	15
	References	16

LIST OF FIGURES

FIGURE No.	DESCRIPTION	PAGE
3.1.1	Flowchart of Object Detection System	7
3.1.2	Sequence diagram of Object Detection System	8
3.1.3	Class diagram of Object Detection System	9
3.2.1	Snapshot of pro.py	10
3.2.2	Snapshot of pro.py	10
3.2.3	Snapshot of pro.py	10
3.2.4	Snapshot of pro.py	11
3.2.5	Snapshot of pro.py	11
4.1	Snapshot of user interface	12
4.2	Snapshot of user interface	13