VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI- 590018

Mini Project Report On

"ADAPTIVE YOLO-BASED REAL-TIME OBJECT DETECTION WITH FRAME CONTROL OPTIMIZATION"

A report submitted in partial fulfillment of the requirements for

MINI PROJECT

In

Computer Science and Engineering (IOT , Cyber Security including Blockchain Technology)

Submitted by

ADARSH S NAIK	4AL22IC001
AISHWARYA	4AL22IC002
AKASH GOUD	4AL22IC003
AMULYA N M	4AL22IC004

Under the Guidance of

Dr. Pradeep V

HOD CSE(ISE/ICB)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (IOT , CYBER SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MOODBIDRI-574225, KARNATAKA

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ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI, D.K. - 574225

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CERTIFICATE

This is to certify that the Project entitled "**Adaptive YOLO-Based Real-Time Object Detection with Frame Control Optimization**" has been successfully completed by

ADARSH S NAIK	4AL22IC001
AISHWARYA	4AL22IC002
AKASH GOUD	4AL22IC003
AMULYA N M	4AL22IC004

the bonafide students of Department of Computer Science & Engineering (IOT , Cyber Security including Blockchain Technology), Alva's Institute of Engineering and Technology in **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (IOT , CYBER SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)** 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 project report has been approved as it satisfies the academic requirements in respect of project workprescribed for the Bachelor of Engineering Degree.

Dr. Pradeep V
Project Guide

Dr. Pradeep V
HOD CSE(ISE/ICB)

H. O. D.
Dept. Of Information Science & Engineering
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

ABSTRACT

You only look once (YOLO) is being used as the most popular object detection software in many intelligent video applications due to its ease of use and high object detection precision. In addition, in recent years, various intelligent vision systems based on high-performance embedded systems are being developed. Nevertheless, the YOLO still requires high-end hardware for successful real-time object detection.

In this paper, we first discuss real-time object detection service of the YOLO on AI embedded systems with resource constraints. In particular, we point out the problems related to real time processing in YOLO object detection associated with network cameras, and then propose a novel YOLO architecture with adaptive frame control (AFC) that can efficiently cope with these problems.

Through various experiments, we show that the proposed AFC can maintain the high precision and convenience of YOLO, and provide real-time object detection service by minimizing total service delay, which remains a limitation of the pure YOLO.