

INTRODUCTION & OBJECTIVES

Problem Statement

Unmanned Aerial Vehicles (UAVs) pose security and surveillance challenges, especially in restricted and sensitive zones.

Manual monitoring is inefficient and error-prone.

Objectives

- Detect UAVs in real-time using vision-based techniques
- Integrate surveillance with vehicle-mounted systems
- Provide fast and accurate alerts for security response

SYSTEM ARCHITECTURE

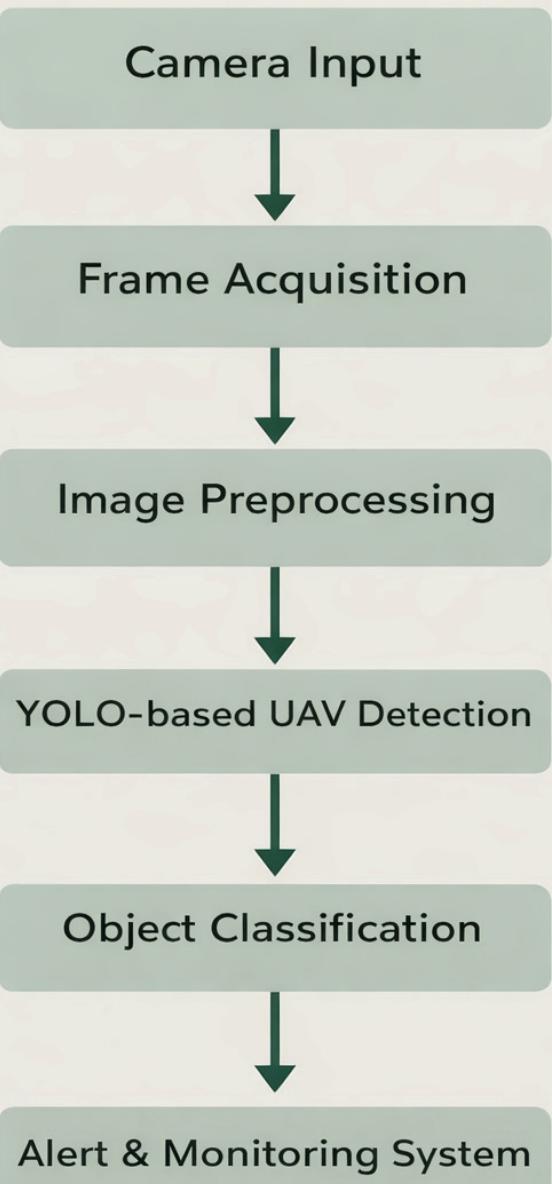
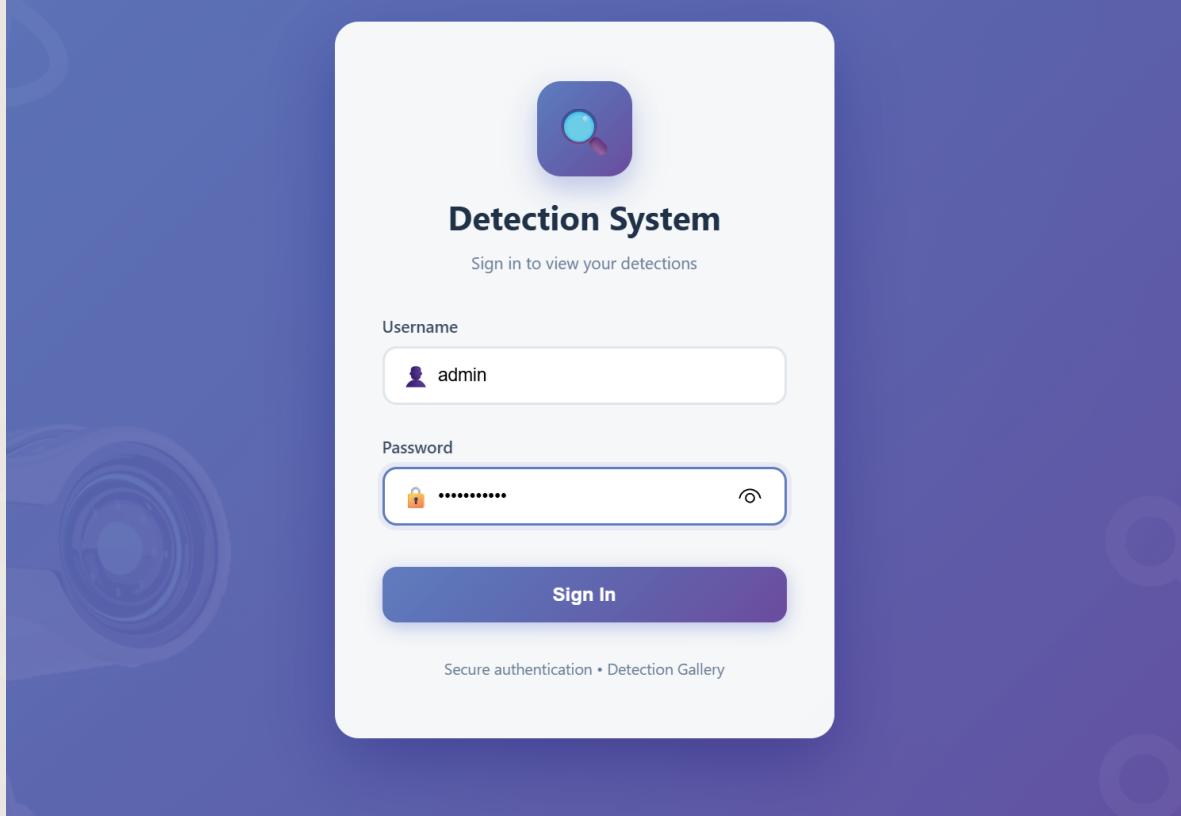
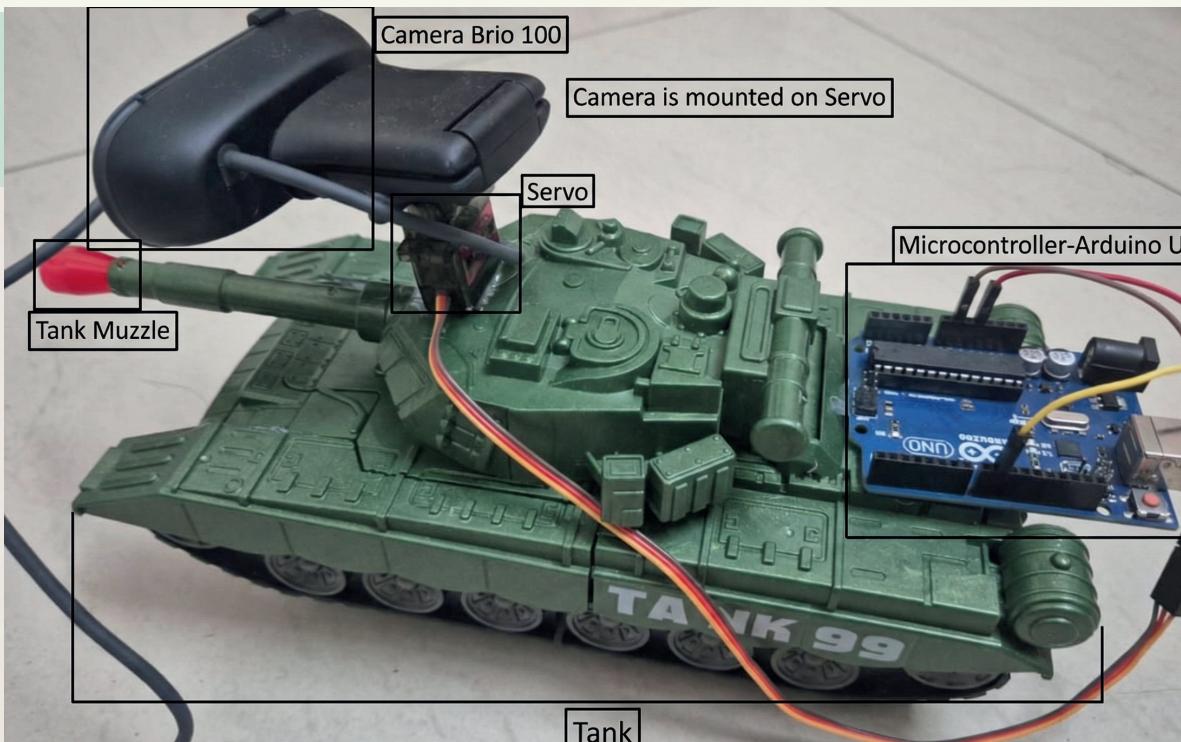


Fig.1 System Architecture of Vehicle Integrated UAV Surveillance System



LEARNING OUTCOMES & FUTURE SCOPE

Learning Outcomes

- Embedded System
- AI Algorithm
- Web Development

Future Scope

- Neutralize System
- Alert Networks

MODULES / COMPONENTS

- Logitech Brio 100
- MG90s Servo
- Arduino UNO R3
- Tank Dummy
- Compute Unit
- Brushless Drone

TOOLS & TECHNOLOGIES

- TKINTER & FLASK
- OPENCV + YOLOV11 (PYTORCH, CUDA)
- USB CAMERA (LIVE FEED)
- SQLite3 + File System
- MULTI-THREADED ARCHITECTURE
- PD CONTROLLER & EMA FILTERING
- SHA-256 AUTHENTICATION

REFERENCES

- YOLO Documentation
- OpenCV Library
- Tkinter Library
- Research papers on UAV detection

