UAV System for Public Infrastructure Inspection

Team 9 | Semester Project

Chapter 1

Introduction & Problem

The maintenance and inspection of public infrastructure are critical for ensuring safety and reliability. Traditional methods are time-consuming, labor-intensive, and hazardous.

The Challenge: Manual Inspection Limitations

Significant Risks

Exposes workers to dangerous environments.

High Operational Costs

Labor-intensive and time-consuming processes.

Delayed Maintenance

Lack of real-time monitoring leads to potential hazards.

Chapter 2

Project Objectives

Our UAV system aims to address these challenges by providing a safer, faster, and more cost-effective solution.

Key Objectives of Our UAV System

Enhance Safety

Reduce human risk in hazardous inspection environments.

Improve Accuracy & Speed

Deliver precise and rapid inspection data.

Real-time Monitoring

Implement automated alerts and continuous oversight.

Reduce Costs

Lower operational expenses for cities and agencies.

Chapter 3

Research & Design

We conducted thorough research and followed a structured design process to develop our solution.

Our Design Process

01

Problem Understanding

Defining requirements and scope.

02

Ideation & Concepts

Brainstorming and sketching initial designs.

03

Prototyping

Developing UAV hardware and software interface.

04

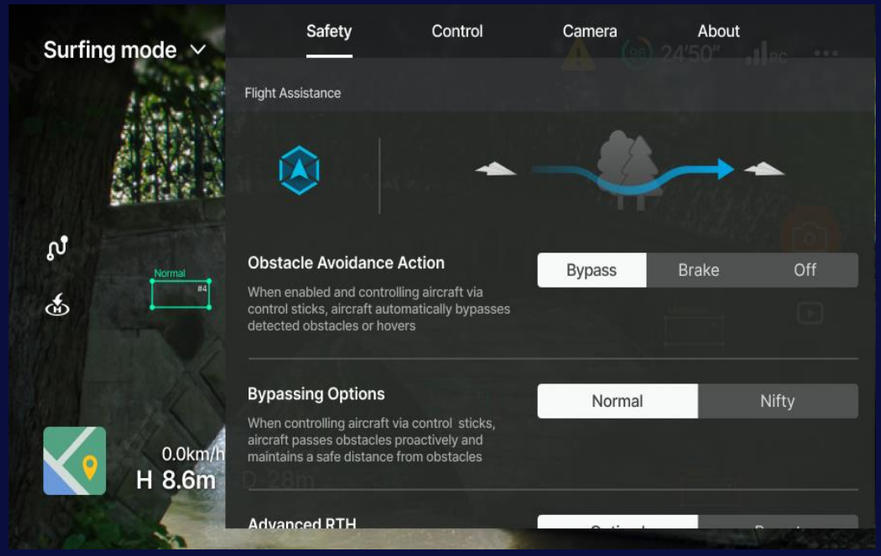
Testing & Iterations

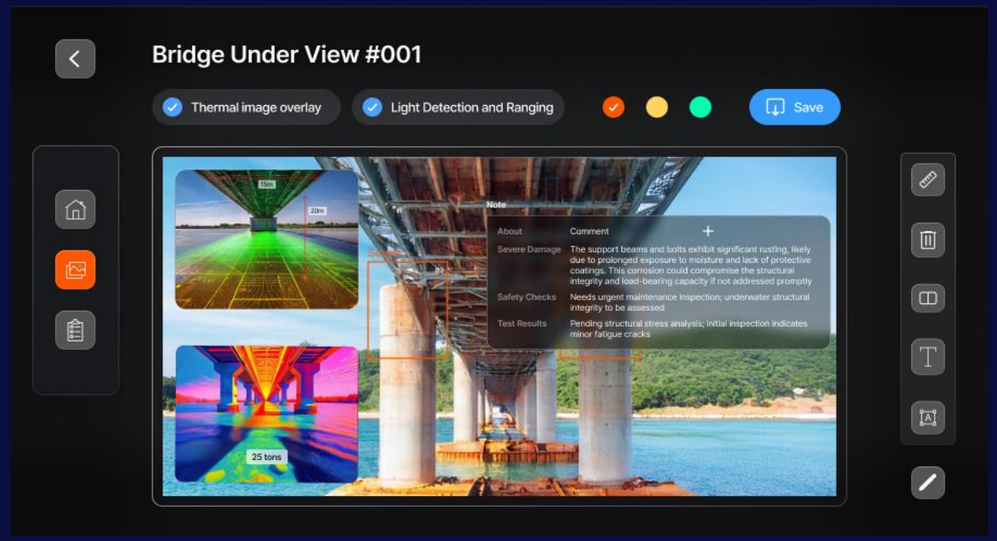
Refining based on feedback and performance.

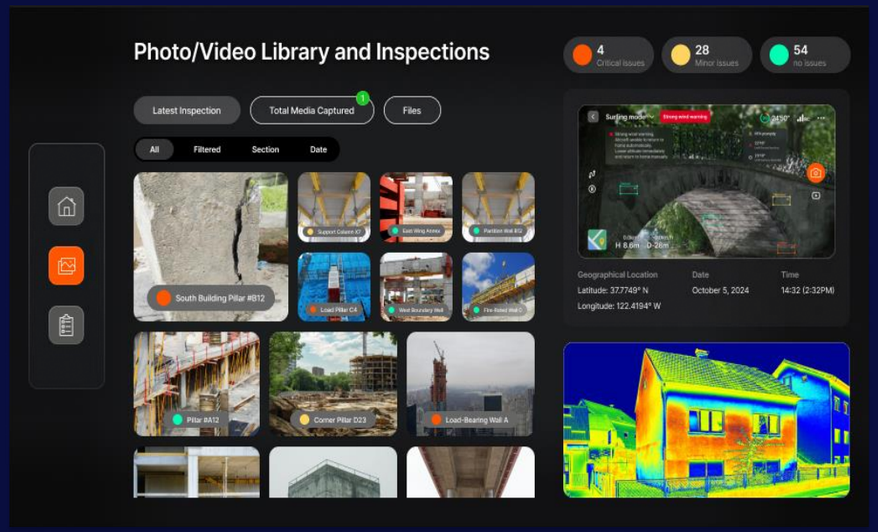
The UAV Solution: Integrated Features

- Obstacle detection system for safe navigation.
- Real-time monitoring dashboard for immediate insights.
- Automated alert system for critical issues.
- High-resolution imaging for precise defect detection.

HIGH Fidelity Designs







Chapter 4

Impact & Future

The UAV system significantly improved safety and efficiency, with exciting future possibilities.

Conclusion & Future Scope

Key Impact

Reduced inspection time and human exposure to hazards, providing more accurate data for decision-making.

Future Directions

- AI-powered defect detection.
- Integration with city management systems.
- Large-scale deployment for smart cities.

This project demonstrates the potential of UAV technology to revolutionize public infrastructure maintenance for smarter, safer cities.