KARTHIKA.J

Final Project

PROJECT TITLE

SkyVision
Advancing Road Safety with UAV-Based Automated Damage Detection

AGENDA

- Problem statement
- Proposed System / solution
- System Development Approach
- Algorithm and Deployment
- Result
- Conclusion
- References

PROBLEM STATEMENT

Despite ongoing efforts to maintain road infrastructure, identifying and addressing road damages in a timely manner remains a significant challenge. Manual inspection processes are time-consuming, costly, and often prone to errors, leading to delays in repairs and compromised road safety. There is a critical need for an automated and efficient system that can accurately detect various types of road damage, such as potholes, cracks, and surface deterioration

PROJECT OVERVIEW

The project aims to revolutionize road damage detection by leveraging Unmanned Aerial Vehicle (UAV) imagery and advanced deep learning techniques. Traditional methods of manual data collection for road infrastructure maintenance are not only labor-intensive but also pose safety risks to personnel. To address these challenges, our approach proposes the integration of UAVs and Artificial Intelligence (AI) technologies. By harnessing the power of deep learning algorithms like YOLOv4, YOLOv5, and YOLOv7, we can achieve precise object detection and localization in UAV-captured images, thereby significantly enhancing the efficiency and accuracy of road damage detection.

WHO ARE THE END USERS?

1. Transportation Authorities
2. Civil Engineers
3. Road Maintenance Crews
4. Traffic Management Agencies
5. Urban Planners
6. Insurance Companies
7. Research Institutions

YOUR SOLUTION AND ITS VALUE PROPOSITION

Solution Overview:

Our solution integrates Unmanned Aerial Vehicle (UAV) imagery with state-of-the-art deep learning algorithms, specifically YOLOv4, YOLOv5, and YOLOv7, for automated road damage detection. This approach enables efficient and accurate identification of various types of road damage, such as potholes, cracks, and surface deterioration, which are crucial for maintaining safe and sustainable transportation infrastructure

Value Proposition:

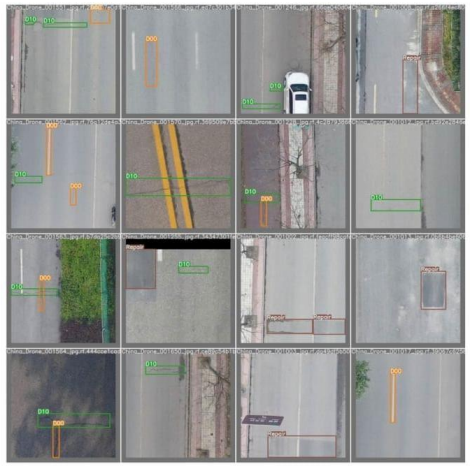
1. Enhanced Efficiency
2. Improved Accuracy
3. Cost Savings
4. Enhanced Safety
5. Data-Driven Insights
6. Scalability
7. Future Innovation

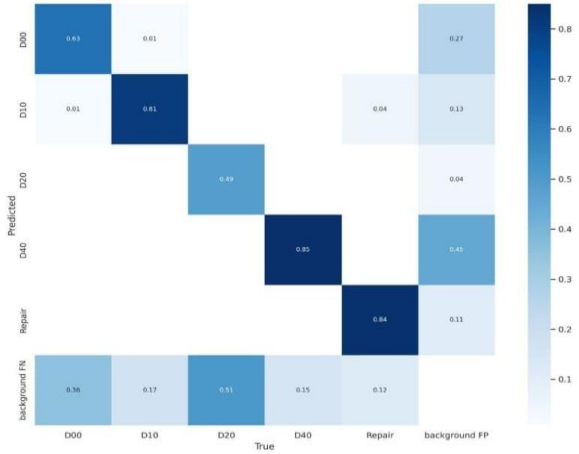
THE WOW IN YOUR SOLUTION

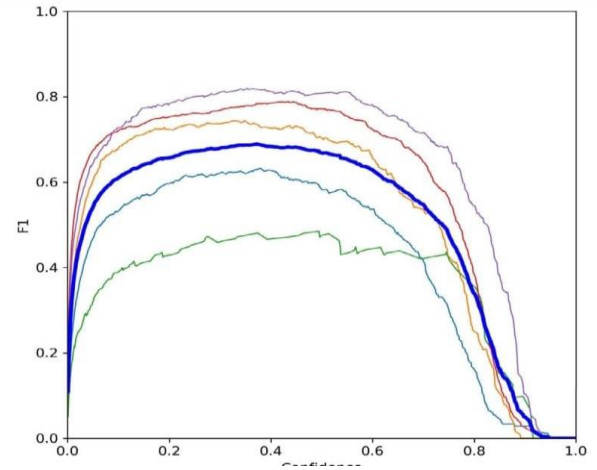
Our solution stands out by seamlessly integrating cutting-edge UAV imagery with state-of-the-art deep learning algorithms, delivering unparalleled precision and efficiency in road damage detection.

MODELLING

Teams cam add wireframes







Utilizing UAV imagery and deep learning algorithms, our model accurately detects and localizes road damages, streamlining infrastructure maintenance.

RESULTS

Our project achieved impressive results, with YOLOv7 demonstrating a 73.20% mean average precision (mAP) at an IoU threshold of 0.5. This signifies a significant advancement in automated road damage detection using UAV images and deep learning. The streamlined process led to enhanced efficiency, cost savings, and improved road safety, showcasing the practical impact of our research. These results pave the way for scalable deployment and future innovations in transportation technology.

Demo Link