Dis Structure

# Formatting + other stuff ill need

Font – Times New Roman

Font size – 12

Line space – 1.5

Page numbers

Table of contents

Bibliography

Harvard referencing

# Intro

**Background information:**

**What is the subject we are covering?**

We are creating a lightweight AI IoT that can be mounted onto a UAV using YOLO and can using object detection CV to detect potholes in real time.

**Definitions?**

YOLO

CV

Object detection

AI

IoT

UAV

**Motivation?**

**Why is this needed / relevant? What is the purpose and justification behind this project?**

As of, the RAC reported that there is an estimate of six potholes per mine across both England and Wales, which causes an average of £600 of damages to fix per car. In addition, the RAC also reported in 2023, that around £824,000 has been paid out to drivers as a direct result to pothole related damages. With the mass number of potholes across England and Wales, being able to detect and locate them is a major step forward in addressing the overall issue of how negatively they affect road safety and road infrastructure. The ability to locate and highlight them is a positive step forward in repairing the mass amount of potholes over time.

https://www.data.gov.uk/dataset/69c309f5-f6a3-4b36-9ff5-f1bea358d151/surface-defects

<https://www.data.gov.uk/dataset/07b933c8-dfb2-4311-8919-16e3964e18f9/pothole-claims>

https://www.data.gov.uk/dataset/9d8eb20f-7835-401c-ae22-f3c2d1a6b2b1/road-condition-survey-2024-2025

**Research questions**

**What are the questions which result from this project?**

For this research, the following questions will be asked: How accurately can a YOLO-based model detect potholes from an image dataset? What challenges will be encountered during the development? How effective will the Geo-tagging capabilities be? Addressing these questions will demonstrate the viability of combining AI, Computer Vision and UAV technology for pothole detection purposes.

# Lit Review – 3k words

**Look back at how I did the related works for Advanced AI – same thing**

Look at what technologies have been created that are similar to what I have created. Evaluate those technologies and compare them to each other. Add illustrations, data, anything niche and specific that is found in the research paper.

* Object detection AI
* CV drones
* YOLO AI

# Research Objectives + Hypotheses

Reiterate what the research objectives are as well as what hypotheses that I will have for this project.

https://www.grammarly.com/blog/academic-writing/how-to-write-a-hypothesis/

# Methodology

Brief re-iteration of the project summary

Explain in detail how we have created our project.

Add illustrations

Add reasoning, both why and why not certain decisions were made – provide evidence if possible

Code Breakdown

Add graphs and charts

Gant chart

Whatever else Issam told us to create

Circuit diagrams

Images of the created project if possible

# Data Collection

Introduction – what data will be using and why?

Obtaining the data – how has the data been obtained?

Ethical issues with the data

Summary of the data

# Data Analysis

A conclusive breakdown of how well the project performs

Add visual information to back up points

# Conclusion

Conclusive summary on how well the project performs

Answer the research questions proposed earlier

What limitations were there creating this project?

what would we do in the future to improve this project overall?

# Appendix

Ethics form