Imperial College London

Department of Electrical and Electronic Engineering

Final Year Project Interim Report 2017



Project Title: **Distributed Road Traffic Speed Monitoring**

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Course:  **4T**

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# Introduction

# Project Specification

From the project description, the goals of the project can be separated into the following:

## Project goals

* Implement a number plate recognition system using existing computer vision algorithms on a low-cost, readily available hardware platform.
* Set up a peer-to-peer network to share vehicle passing times and detect violations without the need for a central server.
* Publish photo evidence of any violations

## Advanced project goals

* Use the changes in the number plate geometry as the vehicle passes to detect the instantaneous speed of a vehicle. This provides a stand-alone mode that will aid adoption in areas where there isn't already an established network.
* Implement automatic peer discovery so that each device can find its neighbours and calculate the minimum legal transit time between them using a public mapping database.
* Add an encryption layer so that a hacker or rogue peer cannot use the network to track the movements of law-abiding vehicles.
* Package the system so that it can be easily installed in a home by an inexperienced user.

After discussions with Dr. Stott, the following clarifications were made:

1. The number plate recognition system should be targeted at an off the shelf package, so there should be minimal setup and calibration done. This also means anyone, with the right equipment, should be able to download and compile the system if they have existing hardware.
2. The low-cost, readily available hardware platform will be a Raspberry Pi (RPi), with a camera attached to it. Using an RPi combines the best of cost (~£30), power (quad core CPU), flexibility (camera can be any USB webcam or RPi’s official cameras), and support (development work on the RPi is extensive and there are ample tutorials/information online)
3. The peer to peer network should ideally be fully decentralised, so the system should be able to find peers without the help of a central server.
4. Publishing photo evidence will most likely be done onto a social network.
5. The public mapping database will be one accessible to most people – Google Maps API.
6. A hacker or rogue peer should not be able to extract license plates from the system remotely.

# Estimation

# Requirements

# Design and Build

# Testing

# Deployment and Maintainance

# References

# Appendix

## Table of Figures

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