Individual Project (CS3IP16)

Department of Computer Science

University of Reading

Project Initiation Document

## PID Sign-Off

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| **Student No.** | **26014212** |
| **Student Name** | **Christopher Githegi** |
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| **Degree programme** (BSc CS/BSc CSwIY) | **BSc Computer Science with Industrial Year** |
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| **Supervisor Name**  *(Consultation with supervisor is mandatory)* | **Atta Badii** |
|  | Supervisor to sign PID form on Bb (grade centre) |
| **Date** | **30/09/2020** |

# SECTION 1 – General Information

## Project Identification

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| **1.1** | **Project Title** |
|  | **Smart City Automatic Number Plate Recognition (ANPR) Traffic Modelling** |
| **1.2** | **Please describe the project with key-phrases (max 5)** |
|  | * Use ANPR data for smart city management * Show drivers showing irregular / Illegal driving behaviour |
| **1.3** | **E-logbook maintenance agreed with supervisor**  *Use Google doc, OneDrive, or any mobile App whereby you will be able to generate a PDF copy* |
| **https://livereadingac-my.sharepoint.com/:o:/g/personal/sc014212\_student\_reading\_ac\_uk/EuXp9vF6dKpHlCF-HTuu\_YwBp1gSjiff3vNvkxcD17l7Kw?e=SxRkHW** |
| **1.4** | **GitLab link for maintain source code and research data**  *Any change in GitLab link and Source code repository MUST be explicitly mention in final report* |
| **https://github.com/ChrisGithegi/FinalYearProject** |

# SECTION 2 – Project Description

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| **2.1** | **Summarise the project’s background in terms of research field /application domain (max 100 words).** |
|  | The research field for my project is to obtain ANPR data from my given area. In this case I will use the reading area as there are a lot of drivers in the area allowing for a high number of vehicles work with.  I will be conducting research to understand the type of drivers there are and the known routes that they will take.  I will use this to define who could be considered a bad driver as there may be some anomalous data that would stand out. |
| **2.2** | **Summarise the project aims, objectives and outputs (max 250 words).** These aims, objectives, and outputs should appear as the tasks, milestones and deliverables in your project plan (fill out Section 3). |
|  | The objective of the project is to take ANPR data and create charts that could suggest drivers who could be a cause of concern based on the routes they take, the known areas that they’re in, if the driver is consistently making this route regardless of the time of day etc.  The data retrieved from the input of the ANPR data will suggest drivers that could be labelled as  “Anomalous Drivers”  The research data we have available will allow for users to identify vehicles that may be a cause for concern if behaviours are persistent. |
| **2.3** | **Initial project specification – roughly indicate key features and functions of your finished program/application. Indicate possible method, data source, technology etc. (max 400 words)** (Sensible and relevant Charts, Table, and Figures can be used) |
|  | The key features and functions I aim to have within my finished program is to allow for ANPR data to take into account the time of day vehicles are making journeys and make a list of common routes made by drivers and make a table of areas they are known to be in alongside a value to recognise how often this driver is in this area.  By Doing so, this will allow for users to distinguish drivers that may be making traffic violations in and around the city. For example a driver could have made it from one checkpoint to another checkpoint abnormally quickly indicating that there is a speeding violation or a driver may have taken a route that is known to only be permitted for only buses and taxi’s meaning that they would have committed a traffic violation for being in a bus/taxi lane.  Using this as a factor would allow for the programme to identify the drivers that could potentially be making these violations and would therefore be due for further investigation. One key factor that would need to take into account is that the data may also require some real-world assumptions about typical patterns of normal driving and abnormal driving in terms of the most frequent patterns of deviant driving. |
| **2.4** | **Describe the social, legal and ethical issues that apply to your project. Does your project require ethical approval? (If your project requires a questionnaire/interview for conducting research and/or collecting data, you will need to apply for an ethical approval)** |
|  | One issue that may occur is because we are using ANPR data, this would reveal numberplates of vehicles and data like this could lead to knowing who owns the car based on where it is registered to etc. One way that this could be handled is by using 1-way hash-mapping in order to hide the details about the numberplate. We would have to ensure that the hash-mapped numberplate ID’s match if a driver does appear on more than one camera.  An alternative method is to synthesise the data where I would create an entire set of instances of “Ok” driving and some instances of irregular driving which would reflect on the real population on drivers. |
| **2.5** | **Identify the items you may need to purchase for your project. A cost upto £200 can be applied (include VAT and shipping if known). You need to have consent of your supervisor. Your request will be assessed by the department.** |
|  | N/A |
| **2.6** | **State whether you need access to specific resources within the department or the University e.g. special devices and workshop** |
|  | N/A |

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| **SECTION 3 - Project Plan** | | | | | | | | | | | | | |
| Please provide your project plan.  Below is an example project plan, you can use any tool or software to generate yours. | | | | | | | | | | | | | |
| **Project stage** | **START DATE: ../../…. <enter the project start date here>****Project Weeks** | | | | | | | | | | | | |
| 0-3 | 3-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-21 | 21-24 | 24-27 | 27-30 | 30-33 | 33-36 | 36-39 | |
| 1 Background Research |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Researching Python & Relevant libraries needed |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Researching Neural Nets |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Researching Relevant ANPR Data |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 2 Analysis/Design |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Designing App/Web Layout |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 3 Develop prototype |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Creating Database to store ANPR Data |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Developing backend to process the input data |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 4 Testing/evaluation/validation |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Testing Smart City Traffic Modelling |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 5 Assessments |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Final Write Up |  |  |  |  |  |  |  |  |  |  |  |  |  | |