Proposed 301 Project

Traffic Camera Image Analysis System

Client: Department of Defence, Peace, Safety and Security, at the Council for Scientific and Industrial Research. (DPSS, CSIR)

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# Vision & Objectives

Traffic. A recent study conducted in 2014 ranked it as number 4 on the list of most annoying things in the modern world. Google is one of the innovators at the forefront of providing users with real-time and up-to-date traffic information. Google Maps gathers their up-to-date traffic information by crowd sourcing GPS location data from its user base. It applies intelligent algorithms to this data and outputs traffic information that can assist users in avoiding areas of high traffic on their daily used routes. Users are even alerted pre-emptively of traffic affecting their routes on their smartphones.

For this project we want to achieve a similar objective, but instead of crowd sourcing the up-to-date traffic data, we want to run image analysis on the live publicly available SANARAL highway cameras along the N1 and various other routes.

# Scope

The team will be required to develop a traffic cameras image analysis system that comprises of an Android mobile app, and possibly a web server. The team will have to first investigate whether the image processing and analysis would be able to run within acceptable performance parameters natively on the Android device only. If not then a web server will need to be implemented in order to handle the heavy processing and then push that information to the Android device via GCM (Google Cloud Messaging).

The team will also have to investigate what the best possible 3rd party open source image processing library is that should be used e.g. OpenCV.

The mobile app should allow the user to set up routes on which they wish to be informed of the traffic. Users should also be able to set the time at which they want to be notified of the traffic on a particular route e.g. at 5PM just before I leave work for home.

The image analysis component should then find all SANRAL traffic cameras (<https://www.i-traffic.co.za/traffic/cameras.aspx>) along that route, apply image processing and intelligence to determine the state of traffic and compile a useful traffic report to be sent to the user.

Bonus points will be awarded for finding other open data sources of traffic cameras and integrating the various sources to provide a more accurate single traffic picture.

# Recommended Skills

Java programming (Android app)

C# programming (web server, preferred but open to other languages)

Android development experience and general Android knowledge will be an advantage.

# Project Deliverables

A copy of the following documentation will be required upon project completion:

* Original tender document
* Requirements specification
* Architecture and Design Document
* Developers Guide
* In terms of software deliverables, we would require all the project source code.

# Intellectual Ownership

The source code can be made open source.

# Client commitment

At least one of the clients would be available twice a month for consultation. Consultation will take place at the CSIR campus during core business hours 8 am to 4 pm. Scheduling of meetings is left to the students, but bear in mind that clients of the project are full time employees and cannot attend meetings on short notice.

The client will also provide an Android device to test with for the duration of the project.