Automated UAV-Based Speed Monitorization in Public Roads

Project Proposal

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1   Objetives

The rapid development of intelligent transportation systems (ITS) has proven an important role in intelligent traffic monitoring, management, dynamic information, and vehicle control services. In particular, vehicle operating speed is a crucial factor for road safety, as it strictly affects occurrence and severity of crashes. Usually, 85th percentile of the operating speed distributions (i.e., V85) in free-flow traffic condition is widely accepted as a base value of consistency evaluation for homogenous portion of existing roads.

Figure 1: Illustration of the UAV available for the project (source: https://www.dji.com/pt/phantom-4-pro-v2).

This project aims at developing a prorotype for automated vehicle speed monitorization in roads, when acquiring data from UAV (i.e., drones, such as the one depicted in Fig. 1). Originally, the main idea is to develop an uncalibrated system, where spped estimation simply yields from the knowledge of ground-truth speed of a specific set of vehicles passing at a particular region (Fig. 2).

Figure 2: Illustration of a possible output of the prototype expected for this project.

2   Work Plan

T1: Study of the existing techniques for object detection and tracking.

T2: Design and development of the data acquisition protocol.

T3: Capture of data in controlled and uncontrolled settings.

T4: System development.

T5: Report writing.

3   Academic Prerequisites

• Interest about Artificial Intelligence and Machine Learning topics.

• Programming skills *Python* (+ *Keras or Pytorch)*.

4   Expected Results

- 1 computational prototype
- 1 report

5   Contact

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