PREDICTING SHORT-TERM TRAFFIC CONGESTION ON URBAN MOTORWAY NETWORK

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1. Problem description

Traffic congestion has become a major issue all around the world, thus policy makers and city managers have huge challenges to improve the quality of life in urban areas. It is a widely occurring traffic phenomenon in metropolitan areas due to the increasing number of road vehicle users and is characterized by slower vehicles' speeds, longer travel times, queues etc.

2. Solution approach

The project idea, illustrated in Fig.1 and Fig.2, is the design and development of Mobility as a Service (MaaS) traffic prediction application using machine learning. It will allow users to input a region and receive traffic information about major roads and highways in the region. For each major road, a machine learning(ML) algorithm is applied to live images of the road, and returns the image information and the level of congestion (low, medium, or high). Having such an application can allow users to check traffic patterns before they leave or on the go, to decide the best route to take. The solution will be in three parts:

- traffic image recognition and prediction
- traffic congestion classification based on vehicle counts
- automated traffic congestion updates on twitter and e-billboard

3. Competition & existing solutions/market size

According to markets forecast, overall market size for Intelligent Transportation System (ITS) is expected to grow from around CAD 23.3 billion in 2018 to CAD 30.7 billion by 2023, splitting evenly between software licenses and related technical services, including Data-as-a-Service (DaaS), Modelling and simulation Software-as-a-Service (m and s SaaS), Analytics-as-a-Service (AaaS), and Platform-as-a-service (PaaS). Even though development of smart cities across the world is driven by the ITS market in roadways, it is still facing daunting challenges in achieving interoperable and standard ITS architecture due to increasing concerns related to public safety and growing traffic congestion problems. Our analysis shows that a significantly larger part of the overall growth for the next several years is in the application of MaaS related solutions to ITS. The push towards the adoption of MaaS using ML is driven by access to near real-time traffic data, and availability of modern IT infrastructure cum software tools to efficiently acquire, store, transform and visualize this information.

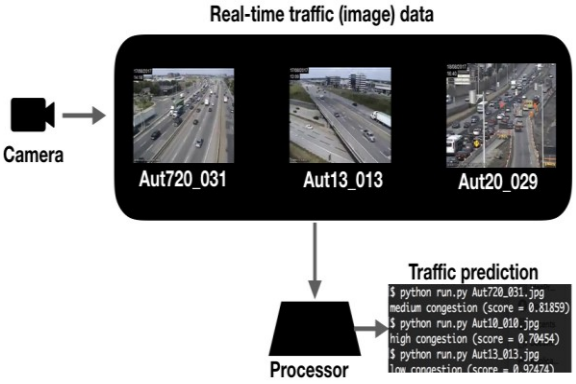

Fig.1: Traffic image recognition and prediction.

Fig. 2: Detection and counts of moving vehicles on the traffic lane.

4. Potential team

The project will bring together a team of experienced professionals with exceptional industry-wide as well as cross-industry capabilities to develop a unique software-based offering for the marketplace. The focus of this team will be on developing the products and associated services in the product operations environment for improved performance of ITS through capturing real-time traffic data and developing data-driven closed-loop monitoring and control solutions to improve mobility by leveraging the predictive capabilities of machine learning. The project team will also apply creative innovation and imagination capabilities to design easy to use products/services and to find other areas of improvements.