

Project Proposal - Virtual traffic

I. Introduction

Conveqs has a data collection and traffic management platform operational at Jätkäsaari. The platform collects real time data from 17 radars and all the traffic light controllers in the corridor connecting Länsiväylä motorway to Länsisatama port. The data are used for traffic monitoring and developing better methods for traffic management (e.g. traffic signal control) in co-operation with Aalto University and City of Helsinki.

In order to research and improve traffic management, it would be useful for both the customers and Conveqs to be able to see how the system operates and how the traffic is moving. For this purpose a comprehensive web-based visualization tool is needed.

2. Project goals

The goal of the project is to build a web based visualization for traffic operations based on Conveqs platform's data (signal statuses, vehicle movement). In particular, what should be implemented are 1) a web server able to connect pre-defined data streams and serving them to clients (back end), and 2) web-app providing the visualization of traffic and traffic signals in the browser (front end).

A more detailed scope will be defined during the project, but at least the end product should be able to:

- 1) Visualize (in real time) the road users and their types (pedestrians, cars, trams, trucks, etc) on top of a map in their actual locations (these are detected by the radar)
- 2) Visualize (in real time) the statuses of the traffic signals connected to the system (i.e. show which directions of traffic flow are given green and which red light)
- 3) Make it possible to configure/fine tune the tool to accommodate the needs of different customers (e.g. choose what data will be shown etc)

3. Technologies

Student team can choose the technologies and development tools for the project. The platform provides standard access to the data (JSON) via REST and Websocket interface to be used for the visualization.



A proof of concept (PoC) has been built by Conveqs. The PoC implementation employed Flask/Quart server (Python) for the backend and Mapbox (Javascript) for the frontend, but the team is not limited to those technologies.

4. Requirements for the students

Understanding of web technologies is needed (Javascript, REST, Websockets, HTML, Server/Client model) in addition to basic programming skills. Expertise on platform and traffic engineering aspects are provided by the customer.

The difficulty of the topic is likely to be moderate, however, it can be modified to become harder (or easier) by tuning the requirements/functionality.

5. Legal Issues

Intellectual Property Rights (IPR): The client gets all IPRs to the results.

Confidentiality: The client will not share any confidential information with the students.

6. Client

Conveqs Oy is a startup founded in 2019 focusing in traffic modeling and management. The company has deep connections with Aalto university and its founding team has a combined 50+ years of expertise in traffic engineering and software development.

The work will be part of the high priority “Jätkäsaari Smart Junction” research initiative and Conveqs has prepared to provide all the manpower and other support needed for a successful completion of this project. In addition, cloud servers, software licenses and other tools needed will be provided by the company.

Contact person/product owner will be Kari Koskinen who has successfully led several similar projects and has a long academic and industry experience in relevant fields. Contact details are:

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7. Additional information

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