Graduate Research Project Outline

Queen’s University, Kingston

Wireless CTCC in Support of VTL for Autonomous Vehicles

SUPERVISORS
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STUDENT BACKGROUND
Students interested in this graduate project should ideally have a background in mechatronics, mobile robotics and wireless technology.

OUTLINE
The subject of this project is virtual traffic light (VTL) technology, where a central traffic control computer (CTCC) communicates with autonomous vehicles and directs traffic flow through a four-way intersection. A traditional VTL decision process is illustrated in Fig. 1. A previous project used a Bluetooth master/slave module mounted on a single mobile robot with a single data stream (range), to demonstrate the feasibility of the concept. This project would set out to determine the limitations of the technology, in terms of the ability to handle multiple mobile robots with multiple data streams (position, speed, range). Specifically, a team of four Arduino-based LynxBots will be tested in a mock streetscape environment (Fig. 2). The student would have to research available communication and decision making protocols, evaluate their feasibility, program the most appropriate, and test the upper limits of the system through both simulation and experimentation.

BIBLIOGRAPHY

Fig. 1. Traditional VTL decision process (from [2]).

Fig. 2. Test setup with four mobile robots.