UNIVERSITY OF SOUTH FLORIDA

Defense of a Master's Thesis

Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) Based Intersection Movement Assist, Lane Change Assist, and Rear Traffic Jam Formation Safety Applications
by
Gustavo Olenscki

For the Master of Science in Computer Engineering

Vehicles can be equipped with inexpensive embedded devices known as on-board units (OBUs) which offers the capability of data exchange. Such vehicles are called Connected Vehicles (CVs). CVs are able to send and receive Basic Safety Messages (BSMs) in order to inform surrounding vehicles or objects about their velocity, position, model, turn-signal, and many other aspects with regards to itself (the Host Vehicle (HV)). With low power consumption, relatively simple and inexpensive installation, OBUs are able to overcome constraints posed by vehicles relying solely on Ego-Vehicle capabilities such as cameras, LiDAR, and Radar. This work proposes Intersection Movement Assist (IMA) and Lane Change Assist (LCA) V2V & V2I safety applications. We simulate different scenarios and strategies to implement a reliable BSM exchange upon encountering physical obstruction. We also propose a traffic jam formation avoidance (Rear Traffic Jam Formation (RTJF)) technique. We validate the proposed applications with CARLA-Connect, a connected and autonomous vehicle simulator. The proposed warning system and negotiation algorithms will serve as the basis for several other V2X applications.

Tuesday, June 13th, 2023
10:00 am
ENB 313
[MS TEAMs](#)

THE PUBLIC IS INVITED

Examining Committee

Srinivas Katkoori, Ph.D., Major Professor
Hao Zheng, Ph.D.
Nasir Ghani, Ph.D.
Pei-Sung Lin, Ph.D.

Robert Bishop, Ph.D.
Dean, College of Engineering

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