## **Electric Vehicle Propulsion and Control**

**Electric Vehicle Propulsion and Control – UNIVAQ** 



E-Pico Master's Thesis



# Robust Intersection Management for Connected Autonomous Vehicles

### Goals

This thesis delves into the safety and performance challenges associated with implementing intersession of autonomous vehicles. It introduces a time and space aware technique designed to address these challenges by being robust against model mismatches, external disturbances, and nondeterministic delays in network and processing time.

#### Requirements

You should understand Automatic control, Machine Learning, Automotive.

#### **Bibliography**

- [1] M. Khayatian, M. Mehrabian and A. Shrivastava, "RIM: Robust Intersection Management for Connected Autonomous Vehicles," 2018 IEEE Real-Time Systems Symposium (RTSS), Nashville, TN, USA, 2018, pp. 35-44, doi: 10.1109/RTSS.2018.00014
- [2] H. Jin, Y. Wei, Z. Yang, Z. Liu and G. Fan, "Multi-Intersection Management for Connected Autonomous Vehicles by Reinforcement Learning," 2023 IEEE 43rd International Conference on Distributed Computing Systems (ICDCS), Hong Kong, Hong Kong, 2023, pp. 649-659, doi: 10.1109/ICDCS57875.2023.00014.
- [3] X. Pan, B. Chen, L. Dai, S. Timotheou and S. A. Evangelou, "A Hierarchical Robust Control Strategy for Decentralized Signal-Free Intersection Management," in IEEE Transactions on Control Systems Technology, vol. 31, no. 5, pp. 2011-2026, Sept. 2023, doi: 10.1109/TCST.2023.3291536.
- [4] S. Aoki and R. Rajkumar, "Safe Intersection Management With Cooperative Perception for Mixed Traffic of Human-Driven and Autonomous Vehicles," in IEEE Open Journal of Vehicular Technology, vol. 3, pp. 251-265, 2022, doi: 10.1109/OJVT.2022.3177437.
- [5] S. Chamideh, W. Tärneberg and M. Kihl, "A Safe and Robust Autonomous Intersection Management System Using a Hierarchical Control Strategy and V2I Communication," in IEEE Systems Journal, vol. 17, no. 1, pp. 50-61, March 2023, doi: 10.1109/JSYST.2022.3221620.