Traffic signal control in urban areas

Bachelor / Master thesis

Supervisor: Prof Themistoklis Charalambous

Description:
In this work, we will consider distributed traffic signal control policies using the max- weight algorithm. We wish to demonstrate via simulations that the developed algorithm performs better than the standard traffic lights used in urban areas in Cyprus.

Keywords: traffic control, urban areas, back pressure, realistic simulator.

Deliverables:

- A thesis in which the current state-of-the-art is briefly described.
- Some methods are implemented on commercial simulation (Aimsun).
- New traffic control mechanisms are developed.

Work type: 20% literature review, 40% simulations, 40% theoretical analysis

Tools: MATLAB, Aimsun (simulation and AI for intelligent mobility)

References:
[1] Qadri, S.S.S.M., Gökçe, M.A. & Öner, E. State-of-art review of traffic signal control methods: challenges and opportunities. Eur. Transp. Res. Rev. 12, 55 (2020).
[2] Themistoklis Charalambous, Muwahida Liaquat, Balázs Kulcsár, and Henk Wymeersch, "Back-Pressure Traffic Signal Control in the Presence of Noisy Queue Information," IFAC World Congress, 2023.