

Title : Considering User Preference and Acceptance of Next  
Generation Route Guidance Systems  
Authors : Marin Lujak, Stefano Giordani and Sascha Ossowski  
Presenter: Marin Lujak

Abstract: In this talk, we treat the problem of the assignment of routes to vehicles in rush hours depending on the traffic situation on the road. Due to the rapidly increasing number of route guidance system (RGS) users, present RGSs might shortly worsen traveling times in congestion since they direct all their users on the same origin-destination (O-D) pair to the same routes. This myopic behavior, together with the assumption that the complete road network information is at the disposal of all the drivers, results in Wardrop equilibrium, which can be arbitrarily more costly than the system optimal traffic assignment. However, the drawback of the system optimum, which is calculated by minimizing total network cost, is that it can produce unfair assignments both for the vehicles on the same and different O-D pairs. This is the reason why, in [1] and [2], we proposed a distributed optimization model that bridges the gap between the user and system optimum considering enviousness and fairness in route assignment. The proposed approach keeps record of the users' satisfaction with route dynamics and assumes that the majority of the road users follow the proposed routes. In this talk, we investigate how to handle various levels of user preference in the previously proposed model and how the variance in the percentage of the vehicles that follow the recommended routes influences the RGS's efficiency and performance. We show simulation results for various scenarios and bring conclusions therefrom.

#### References

- [1] M. Lujak, S. Giordani, S. Ossowski, Fair route guidance: Bridging system and user optimization, in: 17th International IEEE Conference on Intelligent Transportation Systems (ITSC), IEEE, 2014, pp. 1415–1422.
- [2] M. Lujak, S. Giordani, S. Ossowski, Route guidance: Bridging system and user optimization in traffic assignment, Neurocomputing 151 (1) (2015) 449–460.