

## Multi-agent reinforcement learning for route guidance system

### Abstract:

Nowadays, multi-agent systems are used to create applications in a variety of areas, including economics, management, transportation, telecommunications, etc. Importantly, in many domains, the reinforcement learning agents try to learn a task by directly interacting with its environment. The main challenge in route guidance system is to direct vehicles to their destination in a dynamic traffic situation, with the aim of reducing travel times and ensuring efficient use of available road network capacity. This paper proposes a multi-agent reinforcement learning algorithm to find the best and shortest path between the origin and destination nodes. The shortest path such as the lowest cost is calculated using multi-agent reinforcement learning model and it will be suggested to the vehicle drivers in a route guidance system. The proposed algorithm has been evaluated based on Dijkstra's algorithm to find the optimal solution using Kuala Lumpur (KL) road network map. A number of route cases have been used to evaluate the proposed approach based on the road network problems. Finally, the experiment results demonstrate that the proposed approach is feasible and efficient.