# Literature Review on Multi-intersection Control for Connected Autonomous Vehicles

**Bachelor‘s Thesis of Jennifer Steinbach**

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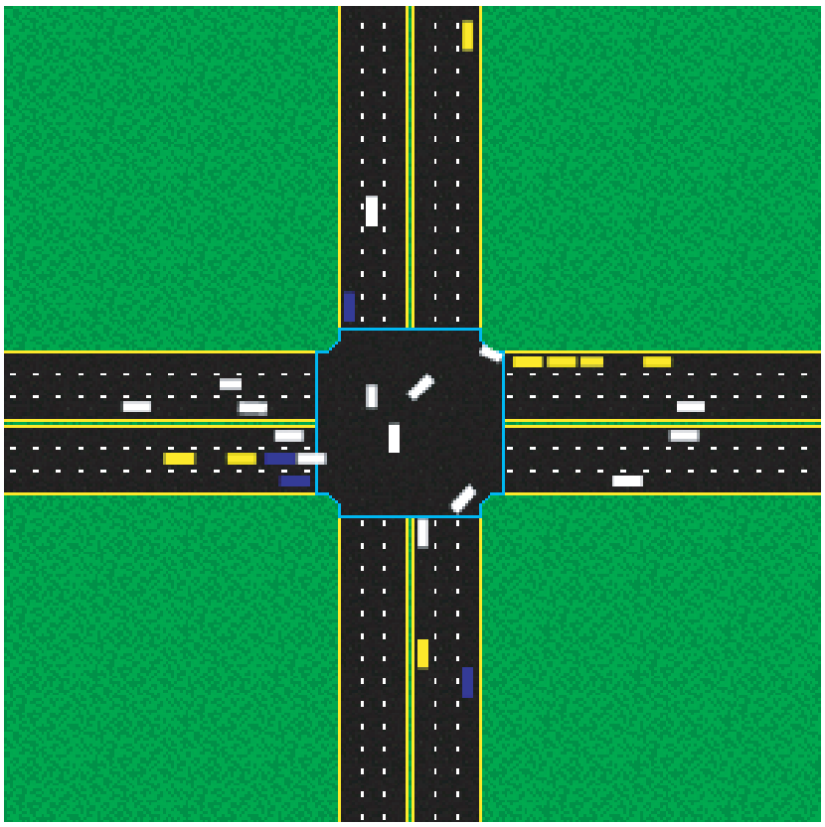
With the rapid progress in wireless communication and comprehensive vehicle technologies, there are now more opportunities to optimally improve driving behavior. Many cars are already equipped with driver assistance systems such as lane departure warning, distance assist, brake assist, etc. It is expected that this technology will continue to develop in the market and eventually lead to fully autonomous driving. The so-called Connected Autonomous Vehicles (CAVs) could be the future on our roads. CAVs are vehicles that are equipped with communication devices and can therefore exchange information to control the movement of vehicles as they cross an intersection. This time-space reservation of intersections is commonly referred to as Autonomous Intersection Management (AIM). In the future it could replace the traffic signals we are familiar with today at intersections. It can also increase the overall efficiency and safety of intersections.



## Autonomous Intersection Management for Single-Intersections

Research has mainly focused on AIM at isolated intersections, but there is a growing number of new approaches that conduct their research on small networks with multiple intersections.

For AIM at a single intersection, many different approaches can be found in the literature, such as the FCFS strategy, whose main rule is that the vehicle that enters the intersection first is allowed to pass first. The heuristic strategy uses limited knowledge and incomplete information to find a feasible solution. The system optimal approaches attempt to focus on optimizing specific parameters of an intersection such as delay, fuel consumption, comfort, etc. by establishing specific algorithms or equations that must be solved to achieve an optimal result.

## Autonomous Intersection Management for Multi-Intersections

More and more research is now focusing on small networks with multiple intersections. CAV control for small networks involves not only AIM at intersections, but also CAV control on road segments between intersections and throughout the network. There are many new approaches to AIM at intersections in a small network and also some that focus on routing of CAVs. Routing is the search for the optimal and most efficient route through a network. There are many different promising approaches.