

Automation of Scaled Vehicles

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Background

The transport sector is going through a major shift with the introduction of autonomous driving systems. The design and development of such systems require a broad set of skills, which this project aims to develop.



Figure 1 The project lab

Project and problem description

One of the main tasks of this project is to design and implement a vehicular system that can move autonomously while communicating with other vehicles for coordinating their actions, such as intersection crossing [1] and merging [2]. This project considers different simulative approaches as well as working with scaled vehicle units (robots). The project requires the ability to work in teams. Specifically, we will work in a dedicated lab, see Figure 1, using advanced autonomous robots, such as [WiFi-Bots](#) (similar to the version in Figure 2) that have many onboard sensors, the ability to communicate with each other, and are externally positioned using an indoor positioning system (GuliView). There is also onboard access to Intel Core i7 and [Jetson TX2](#).

The project can also focus on improving the indoor positioning system (GuliView). It is also possible to focus on [interior monitoring systems](#) (talk to the supervisor).

Technology areas covered in this project

- Software design and development
- Control theory
- Modeling/simulation
- Vision and artificial intelligent
- Communications

Team size

6 to 12 persons in 1 to 2 groups

Objective section

Students on D, E, IT, Z, and Engineering Physics

The final report will be written in Swedish



Figure 1 WiFi-Bot

References

[1] António Casimiro, Emelie Ekenstedt, Elad Michael Schiller "Self-Stabilizing Manoeuvre Negotiation: The Case of Virtual Traffic Lights" SRDS 2019: 354-356

[2] Eleonora Andreotti, Selpi, and Maytheewat Aramrattana "Cooperative merging strategy between connected autonomous vehicles in mixed traffic", Cooperative merging strategy between connected autonomous vehicles in mixed traffic 2022.