



Formation Control of Wheeled Robots

Multi-robot systems offer many advantages over single robots. Tasks can be distributed to multiple robots and performed simultaneously, which leads to higher efficiency and faster task execution.

One of the main difficulties that arises is accurate formation control of a multi-vehicle system. As described by Lawton et al. [2003], there are three types of formation control of multi-robot systems: leader following, behavioral methods and virtual structure techniques. In the leader following approach, a classification between the leader and the followers is made. Behavior-based approach defines several desired behaviors, whose importance is then weighted, in order to get the final control. In the virtual structure approach, the whole robot team is considered to be one entity.

The goal of this thesis is to implement three existing formation control algorithms, and to compare their performance both in simulation and using real TurtleBot 2 robots. For the relative localization, no external tracking system should be used, but only the sensors already available on the robots.

The student should have attended the “Praktikum: Mobile Roboter”, and it is desired to have attended the lecture “Mobile Roboter”.

Knowledge in C++ and ROS is required, as well as good knowledge in calculus.

Communication with the supervisor is in German or English.



Kontakt

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