**Real-Time Safe Navigation in Crowded Dynamic Environments Using Generalized Velocity Obstacles**

We aim at developing a real-time navigation method for a car like agent, the so-called simple car with x,y and theta as states and steering angle as input. To this end, a local motion planner will be introduced which combining the Generalized Velocity Obstacles (GVO) notion and a suitable controller so that the inevitable collision states can successfully be avoided. The proposed method considers only the kinematics of the robot and not its dynamics.

Finally, in order to demonstrate the performance and effectiveness of the proposed motion planner for the steered robot, we plan to use it on either an actual F1-Tenth (scaled down steered vehicle) which we use in our lab or in simulation like we used in class. Some realistic and challenging scenarios with dynamic obstacles can be setup and the vehicle with the algorithm can be tested in these scenarios.

**Works Cited**

Bin Zi, Jun Lin, Sen Qian, Localization, obstacle avoidance planning and control of a cooperative cable parallel robot for multiple mobile cranes, Robotics and Computer-Integrated Manufacturing, Volume 34, 2015, Pages 105-123, ISSN 0736-5845, [https://doi.org/10.1016/j.rcim.2014.11.005.](https://doi.org/10.1016/j.rcim.2014.11.005)

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