Chair of Automotive Technology
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Radar Super Resolution to Enhance Object Detection for Autonomous Driving

Successfully mastering the autonomous driving task depends highly on an accurate representation and understanding of the environment. To achieve such a detailed knowledge of the surrounding, current object detection algorithms use not just camera but also lidar or radar data. However, processing radar point cloud data is challenging due to its low resolution and data sparsity. To counteract this, super resolution techniques can be applied to provide dense point clouds for various perception tasks.

Modern vehicles offer a wide range for environment perception sensors such as camera, lidar and radar sensors. Among these the radar sensor offers a lot of advantages since it is robust to severe weather conditions, is cost-effective and has the ability to measure object velocities. However, the utilization of the radar data is very challenging due its low resolution and data sparsity. Therefore, the goal of this project is the development of a radar super resolution technique.

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The first step of this project consists of a literature research on the current stat of the art in super resolution. In the second step, an algorithm should be implemented to enhance the resolution of the radar point clouds. In the next step, a perception network should be feed with the enhanced point clouds from the super resolution algorithm. Finally, the results of the work should be compared to the current state of the art and validated on a real-world autonomous vehicle.

Work packages

- Literature research on super resolution
- Development of a super resolution algorithm
- Comparison of the results to the current state of the art
- Validation and deduction of an outlook on future improvements

Requirements

- Programming experience in Python or C++
- Experience with the Robot Operating System (ROS2)
- Ideally experience with Docker
- Involved working attitude

Should you be interested in this project or any other project in the context of autonomous driving, send a CV and transcript of records to:

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