

Ingenieurspraxis

# Evaluation of Sensor Data Compression in Teleoperated Driving

This work can be done in German or English

Human perception is mainly based on RGB data, in case of teleoperation captured by RGB cameras and transmitted to the remote operator through a communication network. As mobile networks have a variable and limited transmission rate, sending RGB video data is not always possible. Transmitting processed, high level data of the vehicle's Environment Model (bounding boxes, lane boundaries, traffic lights, etc.) results in a very low bitrate that is required for the transmission, but can be erroneously as the data are already processed. Raw or compressed LIDAR data provide the operator with a good 3D scene representation. However, perception of objects is difficult for the human operator. Using available RGB information and adding their texture in the 3D point improves the representation of the operator but comes with a higher transmission rate.

In this project, we focus on the comparison of the compression of different sensor data mentioned before. This includes image and video compression, point cloud compression, and a combination of both.

## Tasks

- Record several driving scenes in the CARLA simulator [1] containing all sensor information
- Evaluate compression performance on different sensor data using
  - \* JPEG Image Compression
  - \* Video Compression
  - \* Point Cloud Compression

## References

[1] <http://carla.org>

## Prerequisites

- Solid knowledge of video compression/the idea of compression in general
- Experience with Linux and Python
- Basic understanding of ROS

## Advisors

Markus Hofbauer