



Semester-/Master-Thesis

Neural Video Compression with multimodal & semantic Priors

The aim of this study is to improve upon the state of the art neural compression method by leveraging structural and semantic information and beat an existing algorithmic base line

Background

Autonomous vehicles generate huge amounts of sensor data, which is semantically processed by neural networks and classical algorithms to perform the dynamic driving task.

Video data is currently the largest chunk of data transmitted. Recently, neural data compression methods have emerged as a valid alternative to classical methods such as MPEG standards. However, most of the current state-of-the-art methods in neural video compression only deal with video data. In the autonomous vehicle use case, we can assume that there is valuable side information via semantic priors (e.g. semantic segmentation methods) and multimodal information (point clouds, motion information, different camera views) that can be used to further increase the compression rate.

Your Role

- Literature research about current neural data compression methods as well as their evaluation
- Literature research about semantically relevant perception models, e.g. point clouds, semantic segmentation, depth prediction, IMU sensors, etc.
- Integration of semantic and multimodal methods for neural video compression
- Training and evaluation of the developed method

Depending on the type of thesis, this work can be split up in different topics

Was should you bring along?

- Strong interest & motivation for autonomous driving
- Initiative & independent way of working
- Foundational understanding of statistics and machine learning
- Programming skills, e.g. Python

Language

English/German

If you are interested, please send me a grade sheet with your CV!

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