

Masterarbeit

Robust light-weight semantic segmentation of large-scale 3D scenes

Semantic segmentation from point clouds is a challenging task since the methods have to both extract local and global features in a scene. Induced by the pioneering works such as PointNet [1], 3D scene modeling from raw point cloud data has seen a significant growth [2]. Many of the successful models focus on increasing the capacity and the receptive capabilities of the model. The frameworks utilized in these works have either high memory or time complexities or even both. A more recent work further expands the receptive field to make the models efficient [3]. However, having a larger receptive field may result in small details being averaged out and may hinder the performance when the model is fed with out of distribution samples.

In this Master's level research project, the student will investigate how to account for the shortcomings of utilizing a high receptive field. The goal is to transfer the pretrained light-weight models to out of distribution data for semantic segmentation task.

References

[1] Qi, Charles R., et al. "Pointnet: Deep learning on point sets for 3d classification and segmentation."

[2] Guo, Yulan, et al. "Deep learning for 3d point clouds: A survey."

[3] Hu, Qingyong, et al. "Randla-net: Efficient semantic segmentation of large-scale point clouds."

Voraussetzungen

- Experience in Python
- Experience in machine learning, data processing and scientific computing frameworks such as: NumPy, SciPy, Tensorflow, Pytorch, Matplotlib, Pandas
- Experience in 3D Computer Vision

Nice to have

- Experience with the ScanNet dataset
- Experience with the Open3D framework

Kontakt

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Betreuer

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