Optimization of 3D Object Detection Procedures for Indoor Environments
3D object detection has been a major task for point cloud-based 3D reconstruction of indoor environments. Current research has focused on having a low inference time for 3D object detection. While this is preferable, a lot of cases do not profit from this. Especially considering the use of a pre-defined static Digital Twin for AR and robotics application, thus this decreases the incentive for low inference time at the cost of accuracy.

As such this thesis will follow the approach of [1] (in this work only based on point cloud data) to generate proposals of layout and objects in a scene through for example [2]/[3] and use some form of optimization algorithm (reinforcement learning, genetic algorithm) to optimize to the correct solution.

Further, for more geometrical-reasonable results the use of a relationship graph neural network, as in [4], would be applied in the pipeline.

References

https://arxiv.org/abs/2103.07969#:~:text=We explore how a general, from noisy RGB-D scans.

https://arxiv.org/abs/2109.05566


Prerequisites

● Python (Pytorch)
● Experience with Git
● Knowledge in working with 3D Point Clouds (preferable)
● Knowledge about optimization methods (preferable)

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