



Deep Learning for 2D-3D Model Retrieval

Bachelor Thesis / Seminar Project / Master Thesis





Description:

2D-3D object retrieval is the task of identifying objects in RGB images and then to retrieve a fitting model (e.g., CAD, 2.5D rendering) from a database. Possible applications include for example ordering of replacement parts from a retail service or augmenting rendered 3D models into a scene (e.g., virtual living room). Existing approaches typically building on feature extraction and efficient matching was recently replaced by more efficient, more accurate approaches using Deep Neural Networks. The goal of this project is to review related existing approaches and to implement and improve them for specific tasks. To this end, also task specific training and validation data would need to be created, paving the way for more efficient, practical applicable 2D-3D object retrieval. Besides academic and scientific interests, the project is also motivated by requests from industry (also supporting the project), showing that the task is highly relevant in practice.

Objective:

- Review literature on Deep Learning and Object Retrieval
- Create training and validation dataset (images and 3D models)
- Implement and test algorithms
- Apply methods for real-world, industrial applications (optionally)

Qualifications:

- Experience in Matlab, C++, Python
- Interest in Machine Learning (i.e., Deep Learning)
- Interest in GPU programming
- Interest in industrial applications

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