Team Schmalstieg
Institute of Computer Graphics and Vision
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Point Cloud Registration using Deep Learning

Bachelor's Thesis / Seminar Project / Master Project / Master's Thesis

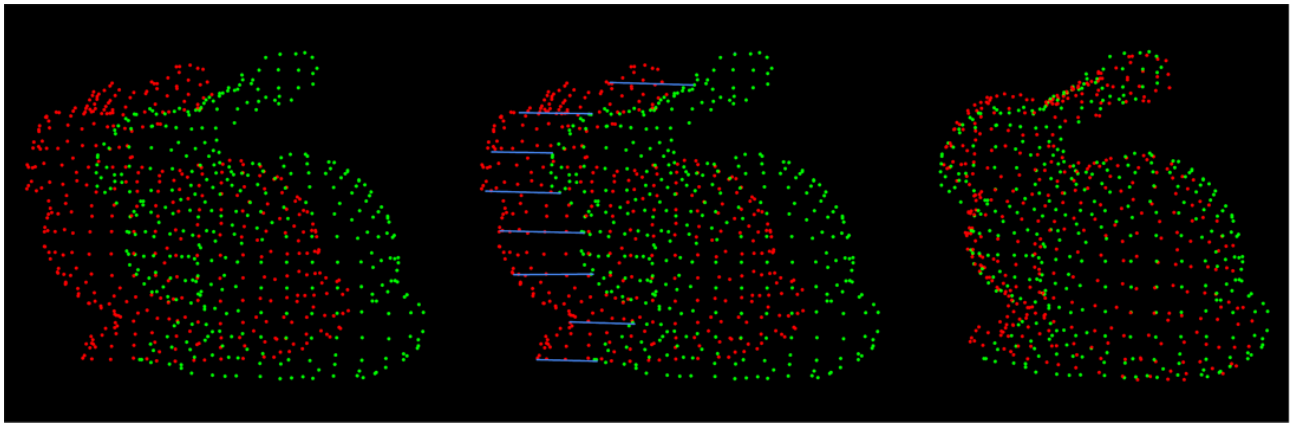

Figure 1: Point cloud registration is the task of estimating a rigid transformation which aligns a source point cloud (red) to a target point cloud (green).

Description:

Point cloud registration is an important problem in computer vision applied to augmented reality or medical imaging, just to name a view. Traditional methods, such as Iterative Closest Point (ICP) and it's variants, face several difficulties, such as converging to local optima. Recently, deep learning has been used for registration, using Neural Networks for either feature localization and description or for inferring a rigid transformation between point clouds directly. In this project, such methods should be explored for their usability in a medical augmented reality scenario.

Objective:

- Research on different approaches for point cloud analysis and registration using deep learning.
- Adaptation of deep learning architectures to and experiments with our own data.
- Integration of deep learning based registration into an existing pipeline.

Qualifications:

- Interest in computer vision and / or augmented reality
- Basic programming skills in Python
- Familiarity with deep learning frameworks such as PyTorch or Tensorflow preferred

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