Training for hand pose estimation with augmented dataset

Problem description:
Hand pose estimation plays an important role in some human-robot interaction tasks, such as gesture recognition and learning grasping capability by human demonstration. Since emergence of consumer-level depth sensing device, a lot of depth image based hand pose estimation methods appeared. For learning based methods, a large dataset for training is required to obtain good performance [1, 4]. Existing hand pose datasets usually only contain clean hand images, where the hand is not in contact with other objects [3, 2]. This constrains the trained models to be applied on hand-object interaction scenarios. To overcome this issue, a hand pose dataset that contains a lot of occlusion cases, is needed, because occlusion often appears during hand-object interaction.

In this Forschungspraxis, the student will add artificial occlusion to existing dataset [3], in order to simulate hand-object interaction cases. The student will then use the augmented dataset to train a neural network following [1], and test the performance in real hand-object interaction scenario.

Work schedule:
- Literature review on hand pose estimation.
- Create augmented dataset.
- Training using augmented dataset.
- Test performance on real captured data.

Bibliography:

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