How to Refine 3D Hand Pose Estimation from Unlabelled Depth Data?

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Task Description

Goal 1: 3D Hand Pose Estimation from Single Depth Image
Goal 2: Automatic Training and Refinement on Unlabelled Depth Data

Technique: Single CNN
Input: Depth Image
Output: Joint Angles (θ)

Contributions:
- Demonstrate how to train a 3D pose estimation CNN on unseen and unlabelled depth images (No ground truth)
- Propose a new training pipeline for 3D hand pose estimation with:
  - a Depth component – for refinement on unlabelled data
  - a Physical and Collision component – for regularization

Full Pipeline

Optimization inside CNN

Joint Angles (θ)

PointCloud (P)

Hand Model, Synthetic and Real Inputs

References


