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Two Hands Pose Estimation from Single RGB-D Images

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ABSTRACT

The work focuses on a method for annotating images of two hands manipulating an object and interacting with each other, with the 3D poses of both the hands and the object. It is very important and upcoming given its applications in Robotics and Augmented Reality. Currently, there lies a deficit or lesser understanding of real-world datasets which are annotated with pose and segmentation in hands-object scenario due to the result of this being a very challenging problem. When considering both the hands, the problem amplifies due to severe mutual, partial and self-occlusions.

The project aimed on hand segmentations alongwith an object from a single image and 2D joint prediction from Pose machine networks as initialisation for a formalized non-linear optimisation problem, to estimate poses in real time. Developing an automated annotation algorithm is very important given the lack of real-world datasets in the arena of robot vision. Significant improvements were made while capturing the motion of two hands without sync of each other. The dataset currently comprises of more than $35,000$ images of hands annotated with their 3D poses and 2D binary masks, for spearheading research into the arena.

[**Artificial Robotics**]: Pose Estimation, Computer Vision, Robotics, Deep Learning, Image Processing