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Category-level 6D object pose recovery in depth images

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Intra-class variations, distribution shifts among source and target domains are the major challenges of category level tasks. In this study, we address category level full 6D object pose estimation in the context of depth modality, introducing a novel part-based architecture that can tackle the above mentioned challenges. Our architecture particularly adapts the distribution shifts arising from shape discrepancies and naturally removes the variations of texture, illumination, pose, etc. so we call it as Intrinsic Structure Adaptor (ISA). We engineer ISA based on the innovations: (1) Semantically Selected Centers (SSC) are proposed in order to define the 6D pose at the level of categories, (2) 3D skeleton structures, which we derive as shape-invariant features are used to represent the parts extracted from the instances of given categories and privileged one-class learning is employed based on these parts, (3) graph matching is performed during training in such a way that the adaptation/generalization capability of the proposed architecture is improved across unseen instances. Experiments validate the promising performance of the proposed architecture.

Biography

Caner Sahin is a PhD student in Imperial Computer Vision and Learning Lab at the Department of Electrical and Electronic Engineering of Imperial College, London. His PhD research is based on computer vision and machine learning. Particularly, he is working on object recognition, detection and 6D pose estimation.

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