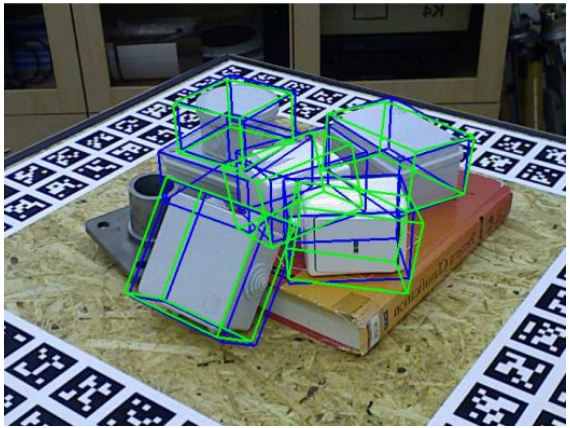
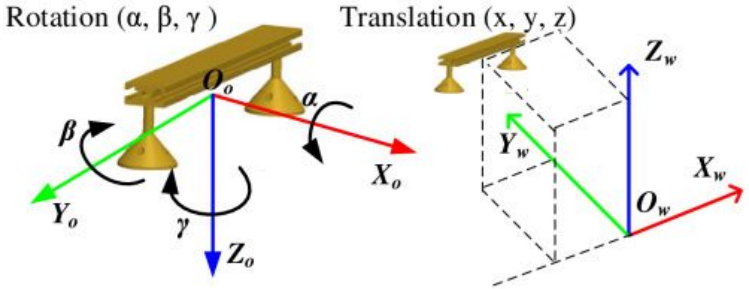
DeepSCOPE
Unsupervised Geometry Synthesis for Common Objects Pose Estimation

Saksham Gupta, Xiaolong Li, Lynn Abbott





Presented By: Saksham Gupta
saksham@vt.edu

VIRGINIA TECH

Github Repository

Google Slides Link

Unsupervised Geometry Synthesis for Common Objects Pose Estimation

INTRODUCTION

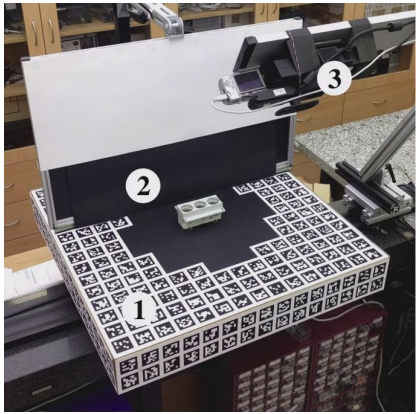
Applications

Robotic Manipulation

Augmented Reality

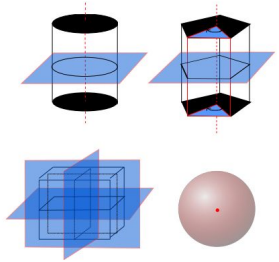
Challenges

Pose Annotation is Expensive



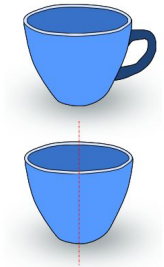
Generalizing to real world images

Symmetry

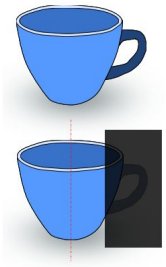


(a) Object symmetries

Occlusion



(b) Self-occlusion induced symmetries



(c) Occlusion induced symmetries

Solution

Use Unsupervised and semi-supervised techniques

Train on artificial datasets, but train to identify background noise

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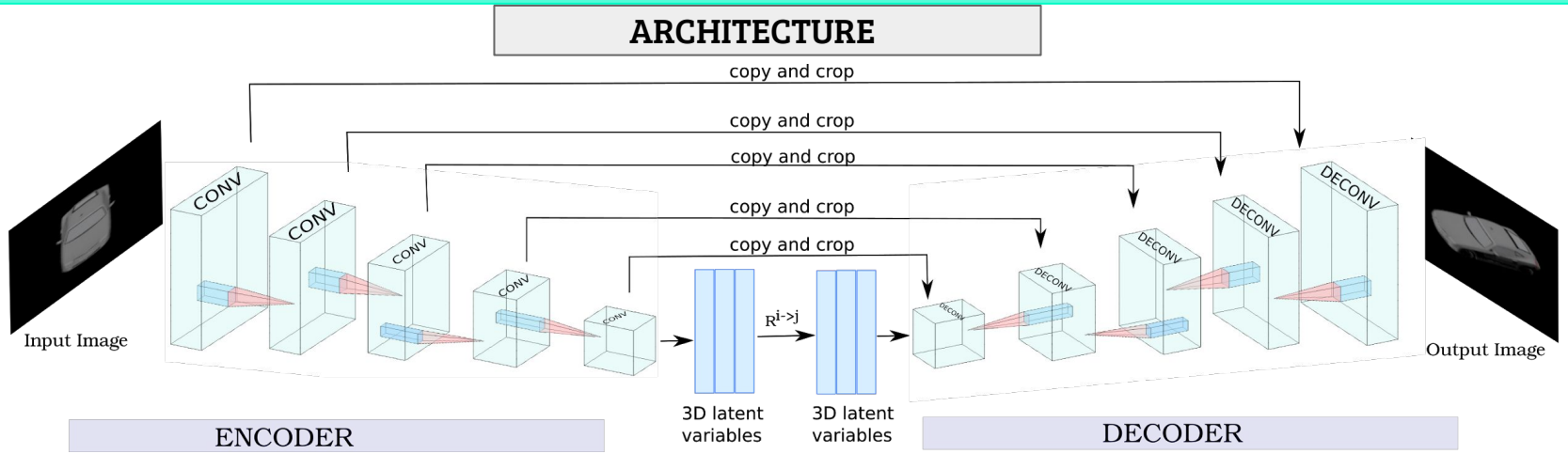
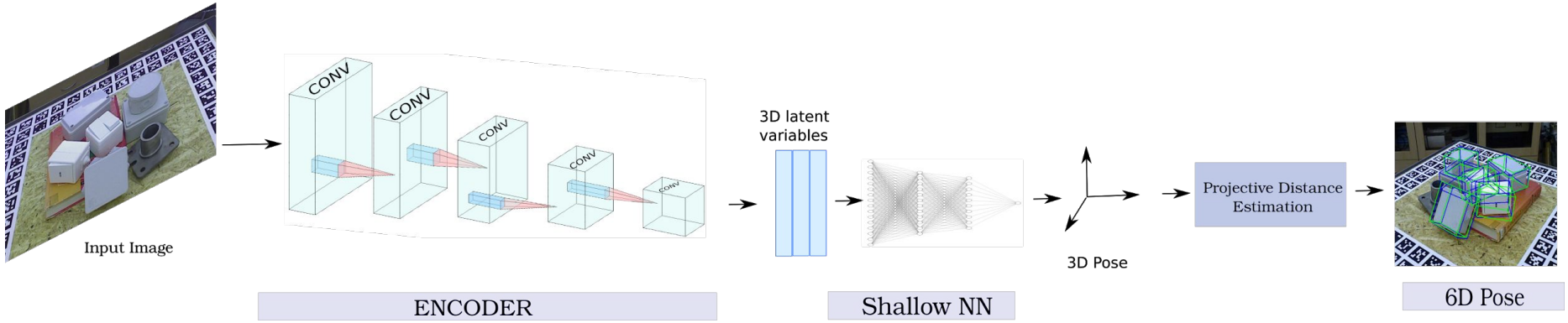


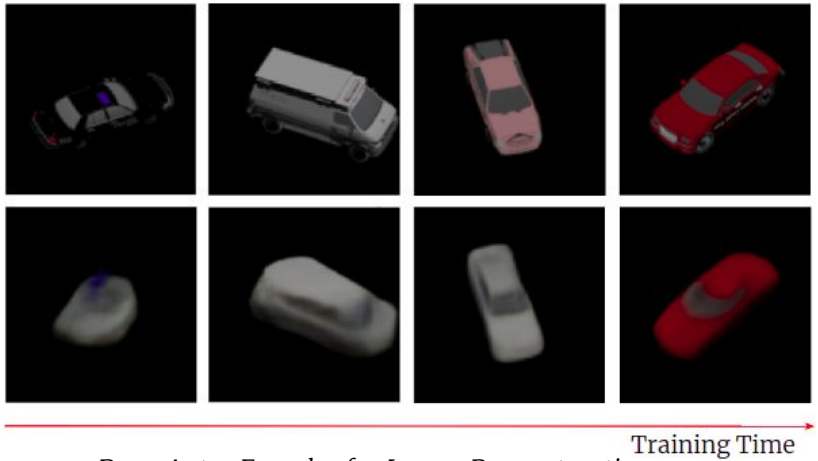
Novel View Generation Pipeline



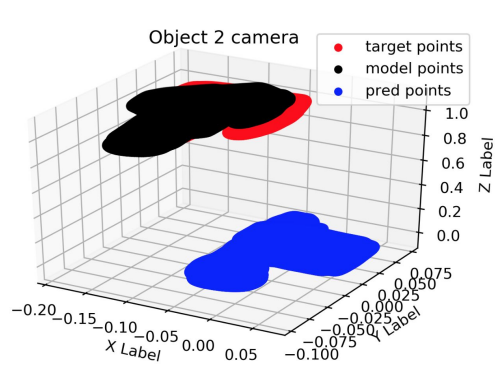
6D Pose Prediction Pipeline

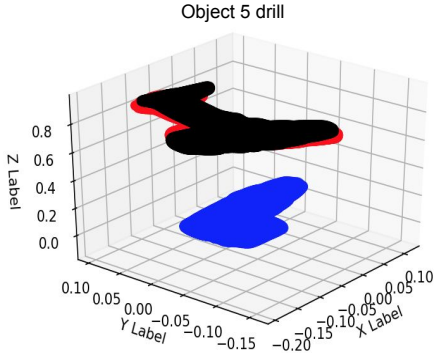
Unsupervised Geometry Synthesis for Common Objects Pose Estimation

PRELIMINARY RESULTS



Deep Auto-Encoder for Image Reconstruction





6D Pose Estimation Baseline(Ours)

Examples of Falling Things dataset