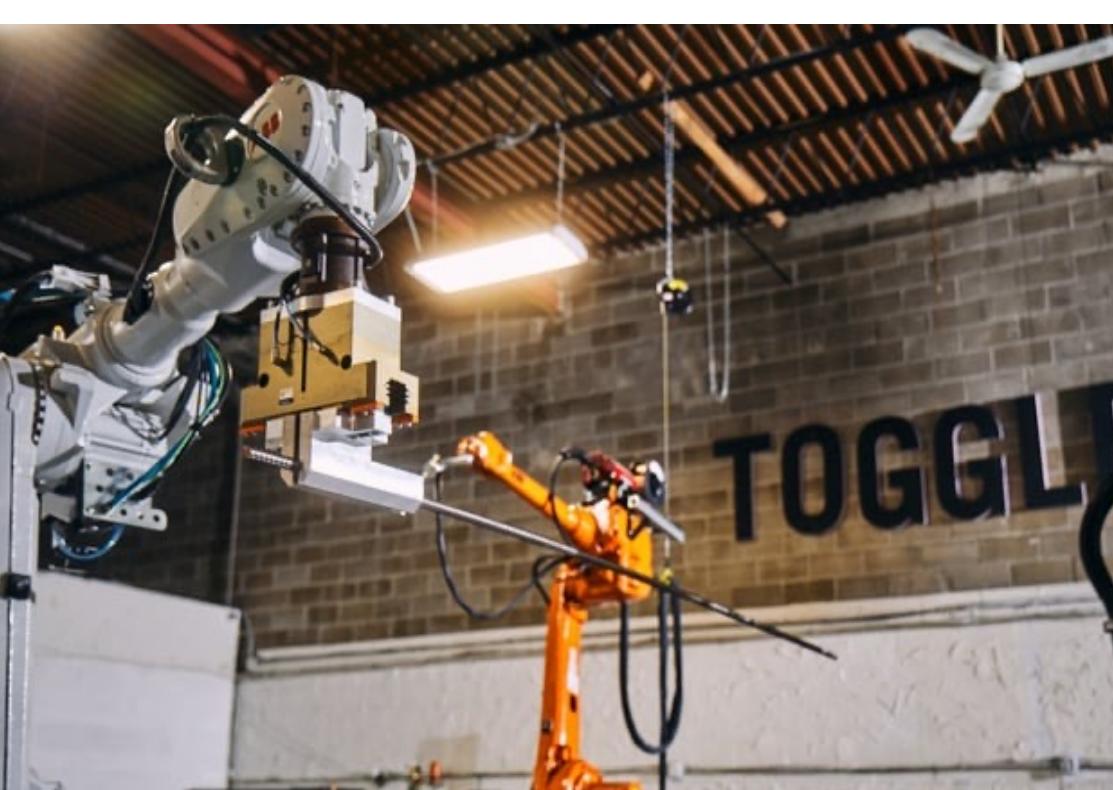


Motivation

Rebar recognition drives automation in reinforcement work



Quality Control



Robotic Manipulation

Segmenting rebars from **3D point clouds** vs. 2D images:

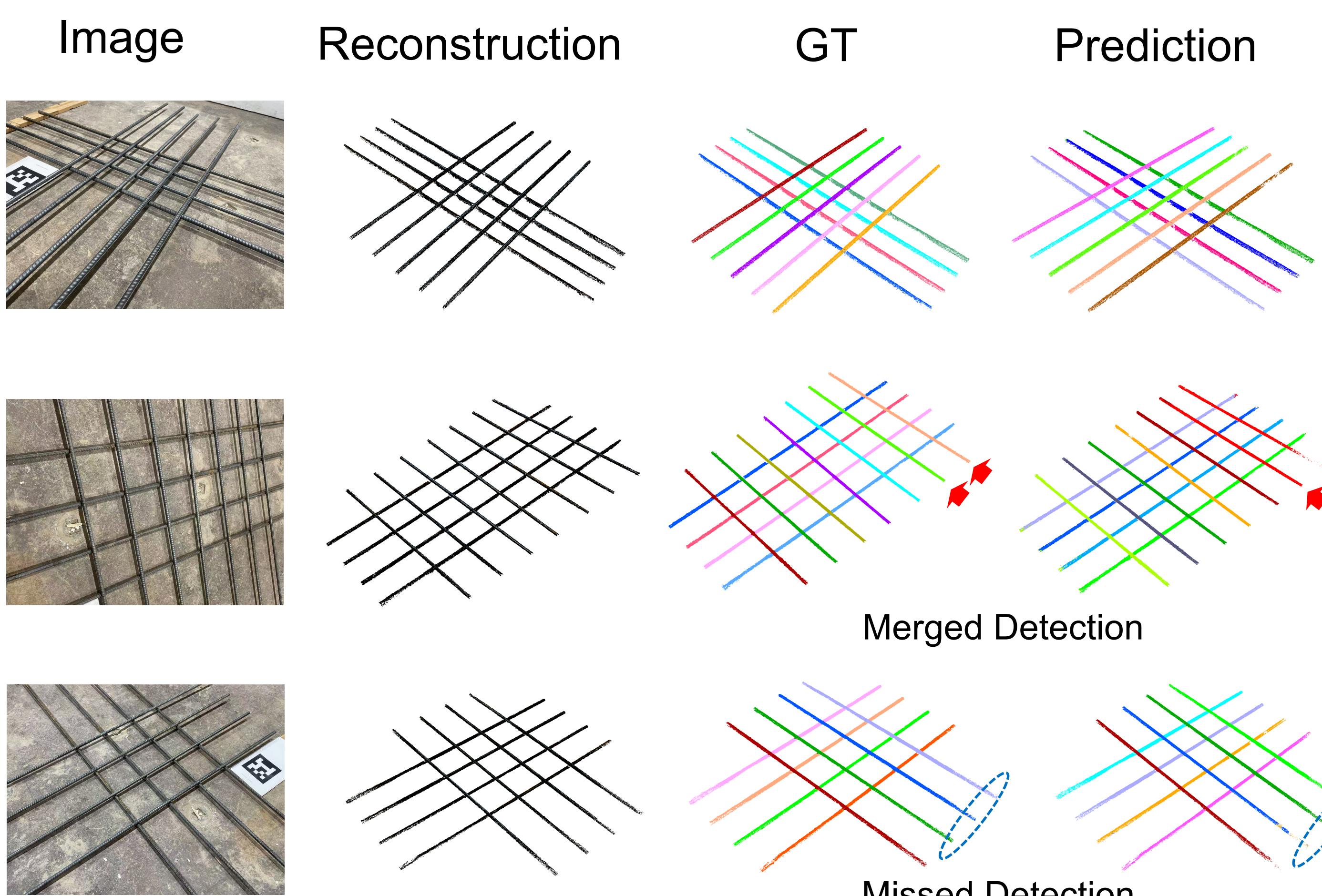
Better leverages 3D priors (more robust to occlusions and perspective variations)

Scales to large scenes (more efficient detection)

Deployment bottleneck: Scarce high-quality 3D dataset

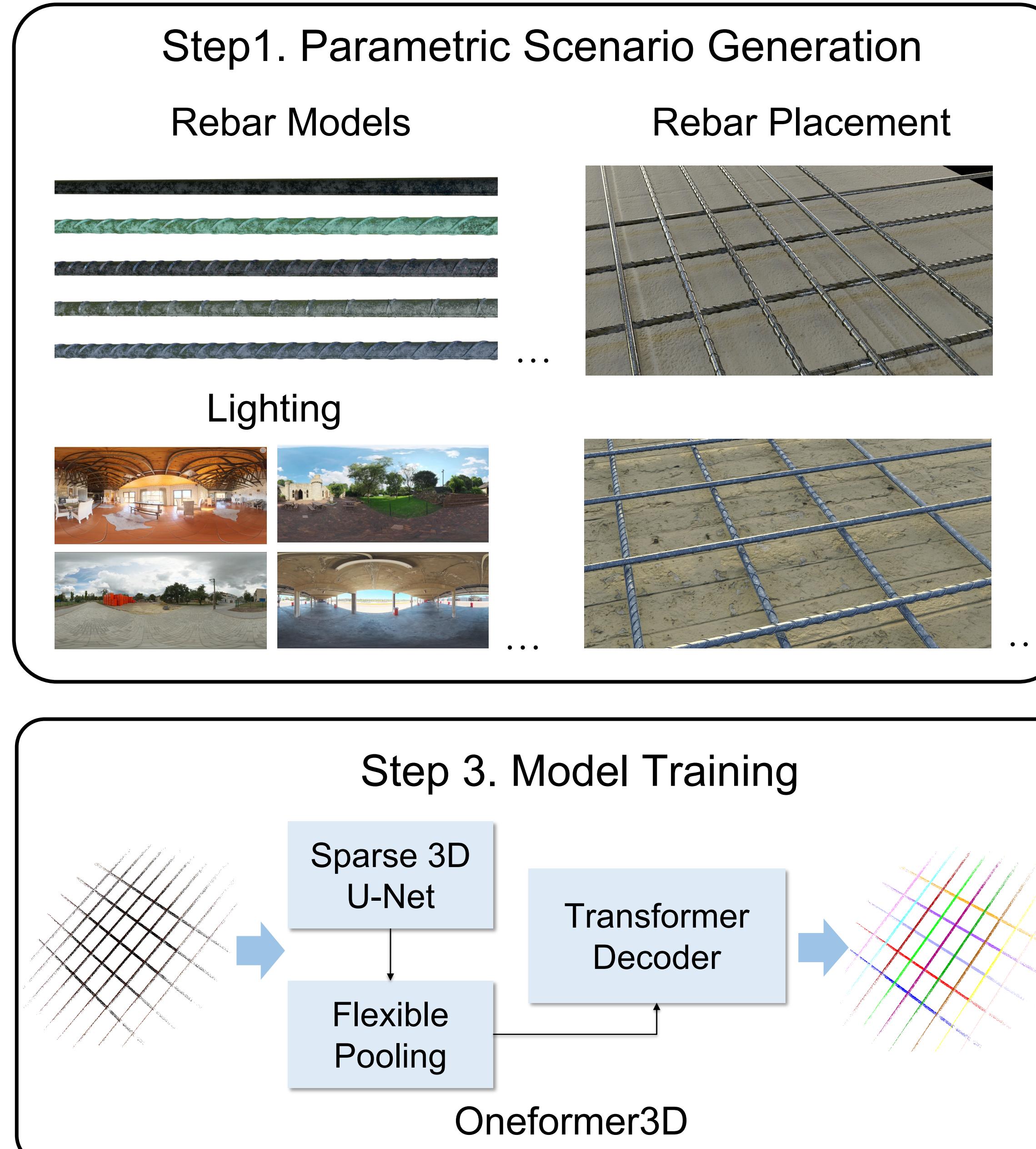
Can we learn rebar segmentation from point cloud using synthetic data?

Experiment & Results



Domain	Segmentation mAP
Synthetic	99.4
Real	95.4

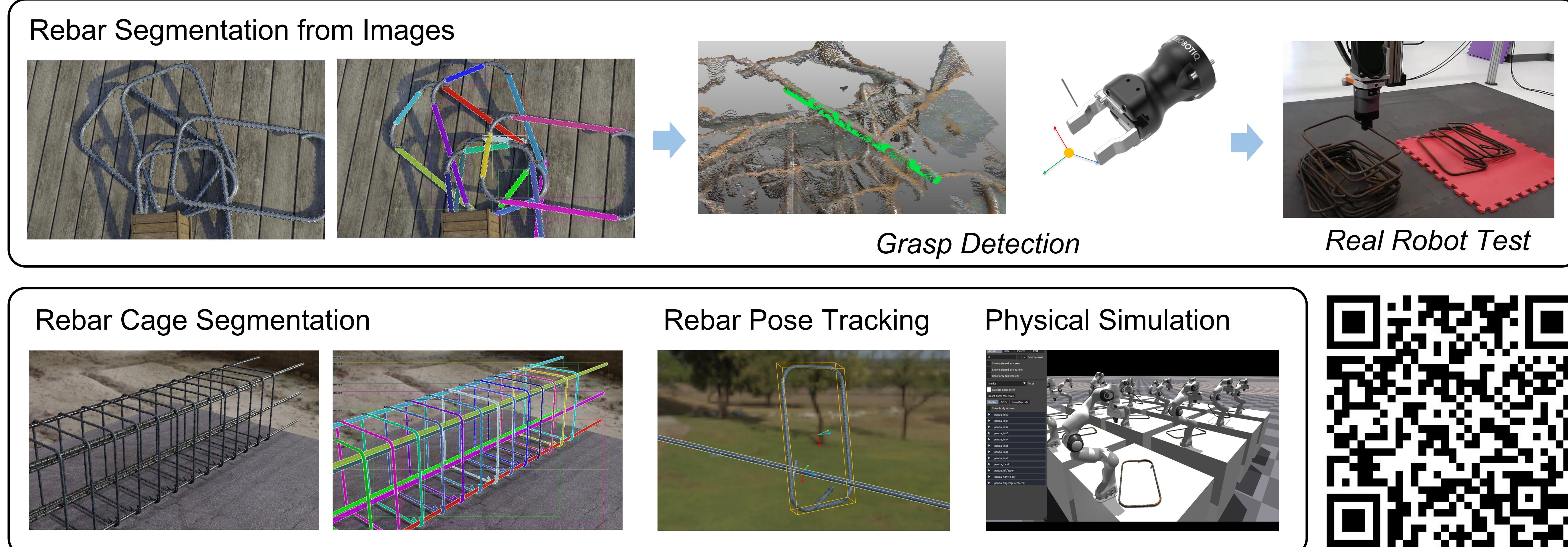
Method



- Highlights**
- ⌚ Parametric rebar asset modelling
 - ⌚ High-fidelity data generation
 - ⌚ Zero manual labeling expenses

Extension

Our pipeline can be easily generalized to other rebar recognition tasks [1]



[1] Sun, Tao, et al. "Rebar grasp detection using a synthetic model generator and domain randomization." *Automation in Construction* 176 (2025): 106252.