Assembly Object Detection From 3D Cad Models in Manufacturing Environments

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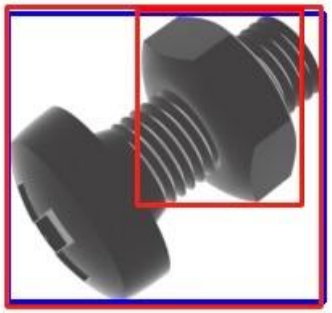
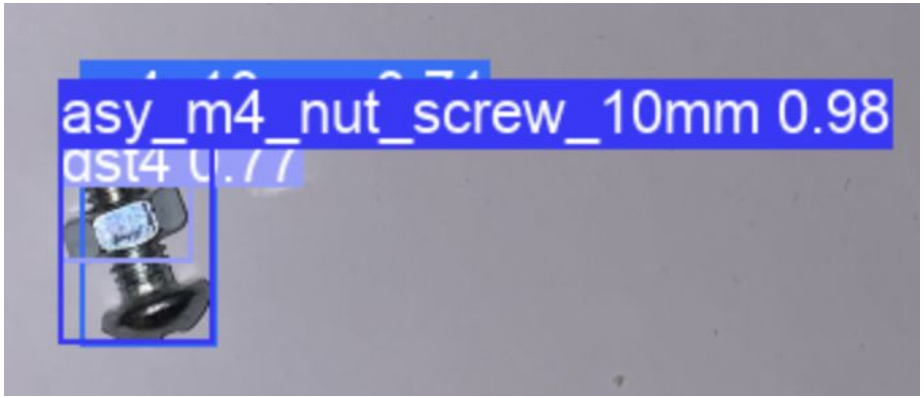
Problem statement

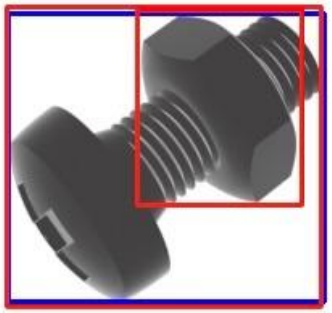
- Object detection of assemblies in manufacturing environment
- Synthetic training data created from 3D Cad Models
- Application with automated workflow

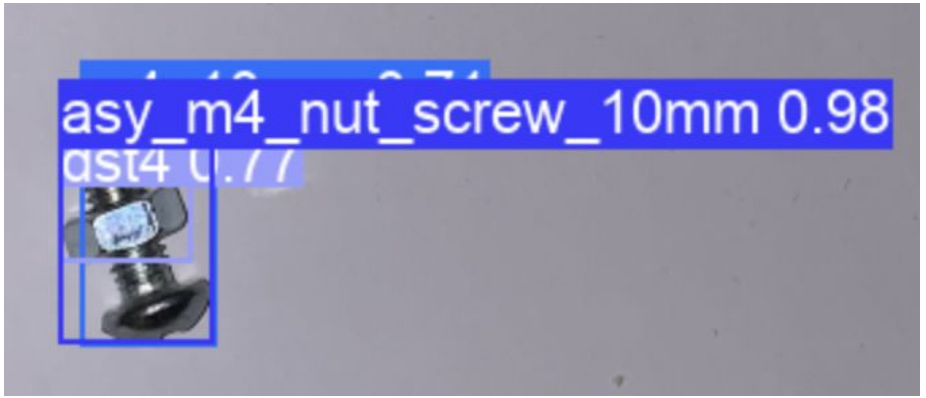




Challenges

- Assemblies: Overlaying parts
- Simulation to reality
- Reducing human involvement
- Robustness of the model

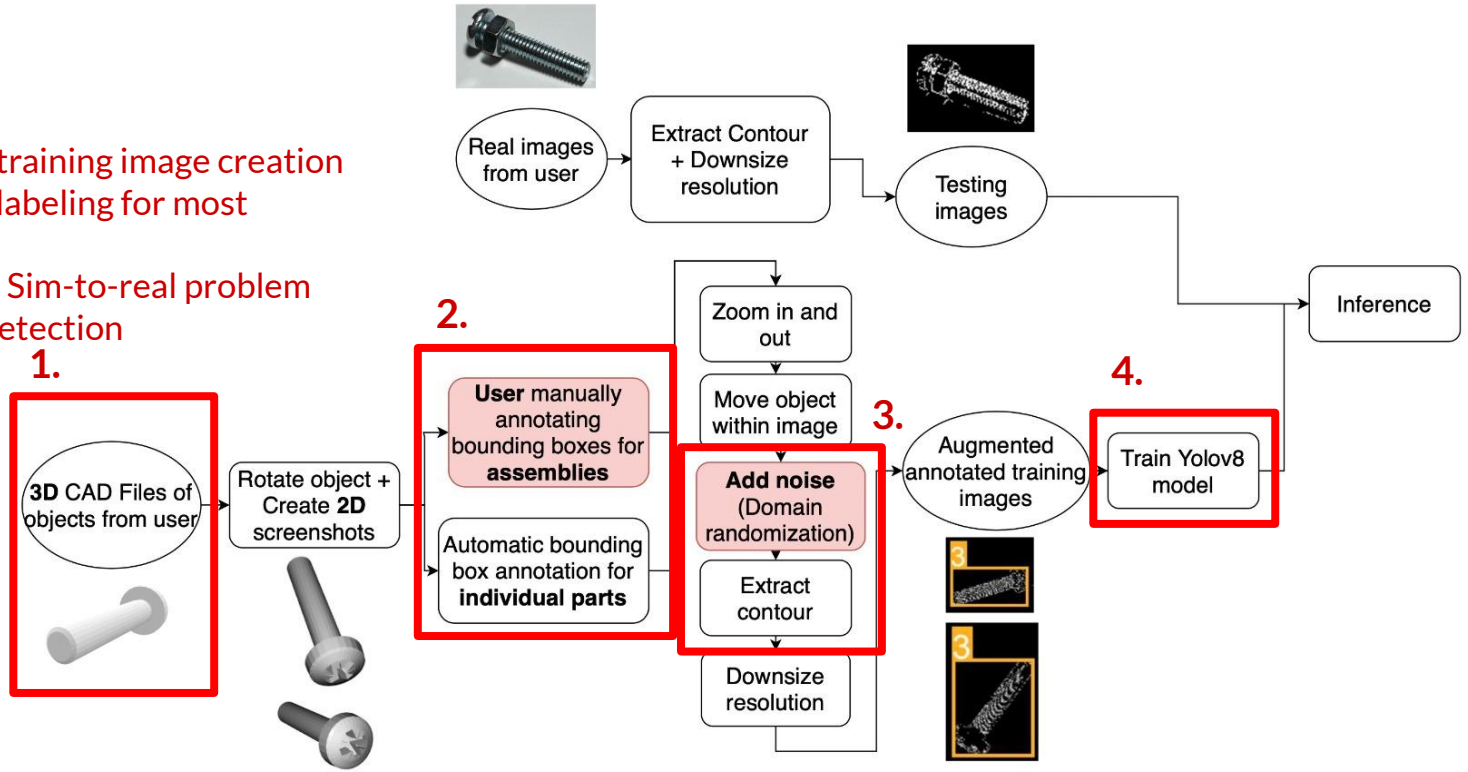




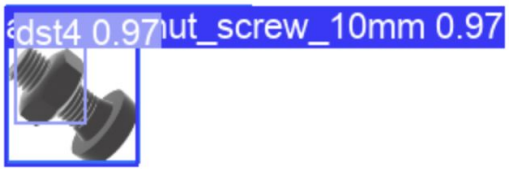
Solution Architecture

Main points:

1. Automatic training image creation
2. Automatic labeling for most images
3. Addressing Sim-to-real problem
4. Real time detection



Application demo



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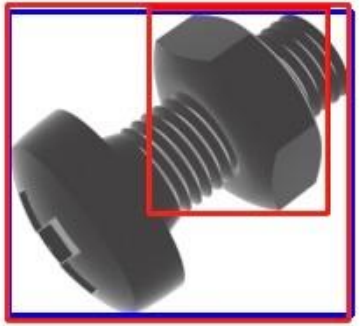

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Advantages

- Ability to predict sub-parts of assemblies in real-time
- Robust model
- Minimal human work needed for
  - creating training images (3D Cad models)
  - labeling (Automated bounding box creation)
  - training workflow (Application with GUI)

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