Unified Classical and Learned Control for Robust Aerial Manipulation

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Overview
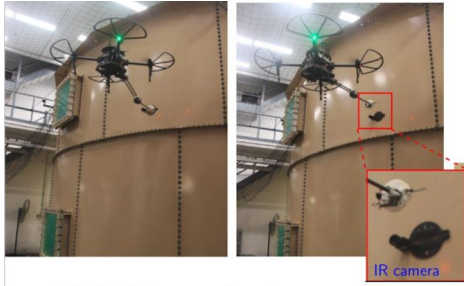
JHU AirGripper performing sensor placement

JHU AirGripper performing package sorting

environmental sensor placement

vehicle for larger payloads

- Improve robustness of agile robotic systems operating in difficult conditions
- Applications to aerial grasping and aerial operations through contact
- Develop autonomy architecture that combines standard and machine learned components
- Theory and methods applicable to general autonomous systems

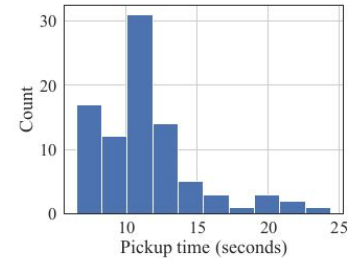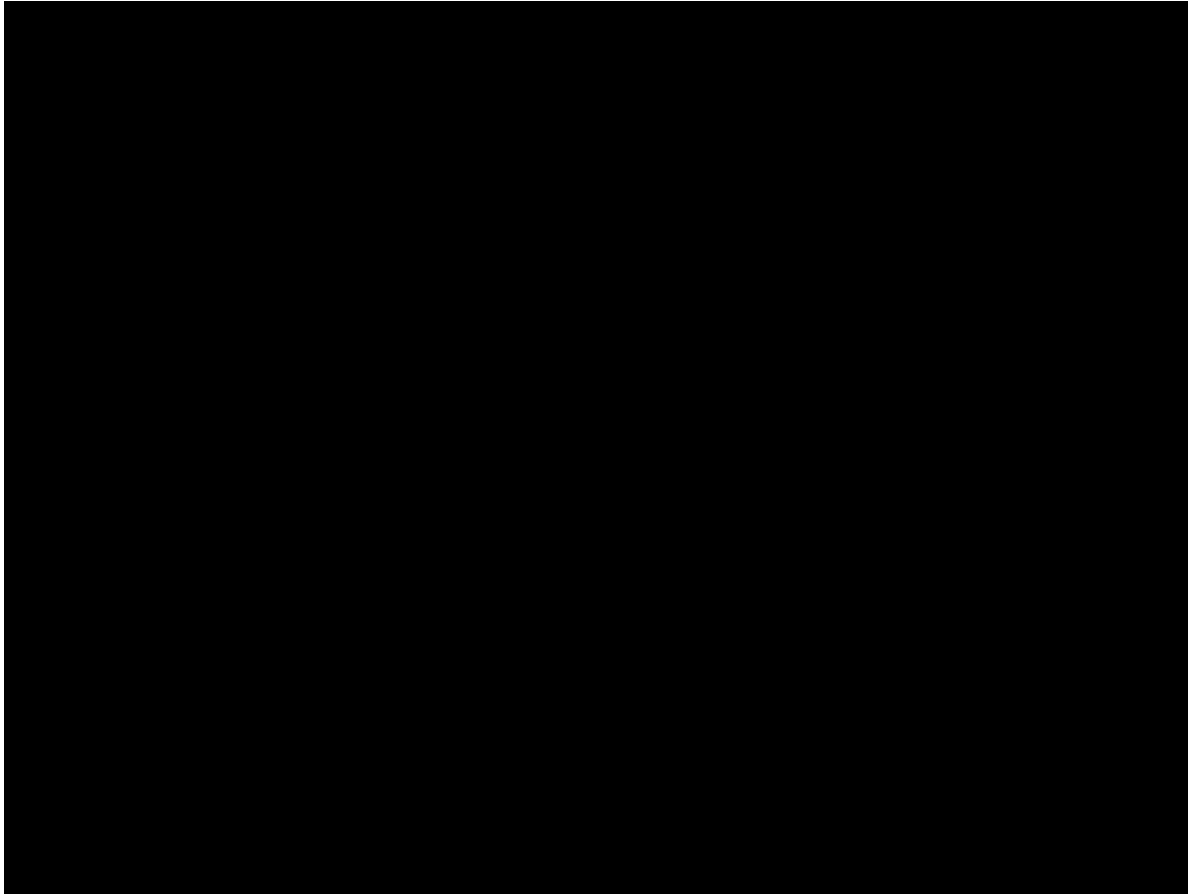# System architecture: unifying standard and learned control

Standard:
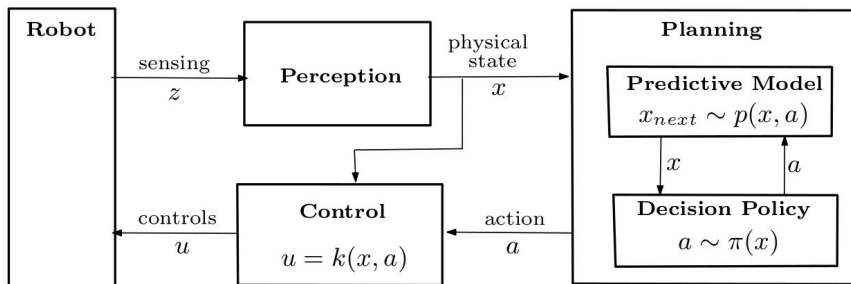
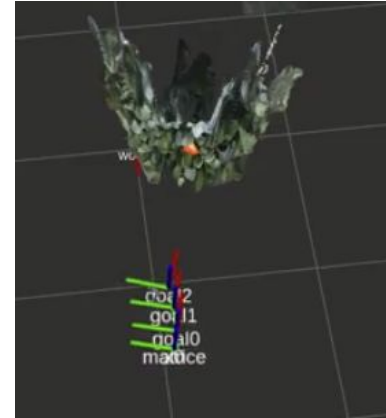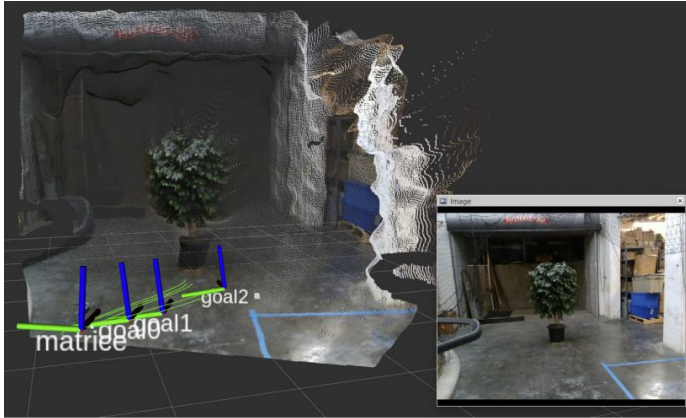Standard model-based + machine-learning:
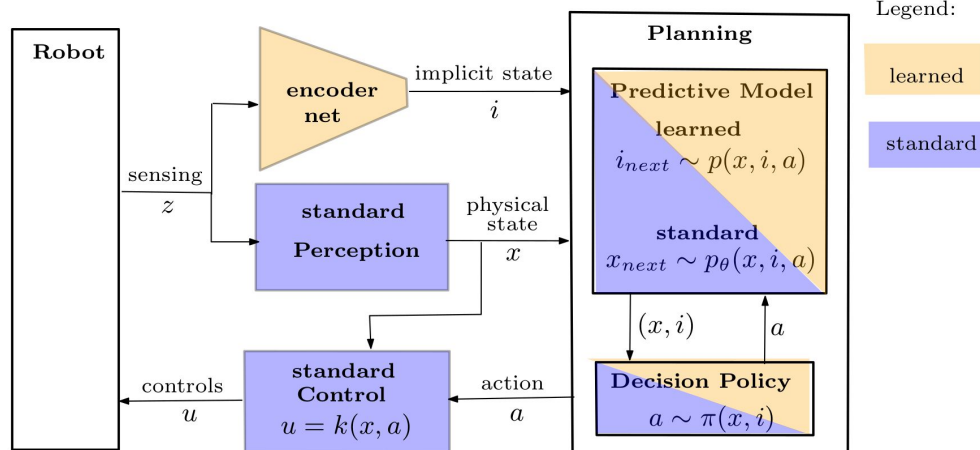
Warehouse Logistics (an example application)

Success Rate	91/101
Min Time	6.5 seconds
Mean Time	11.5 seconds
Max Time	25 seconds
Mean Error x	2.1cm
Mean Error y	2.5cm
Mean Error z	1 cm
Mean Error ψ	0.03 rad

Current Focus

- Tighter integration with perceptual learning, and applications to fruit grasping

- New smaller more agile system for indoor usage near humans