

Faculty of Engineering

Summer Research Program 2023-2024

Project Title: Learning sequential robot assembly in furniture bench

Supervisor(s): Michael Burke

Department: Electrical and Computer Systems Engineering

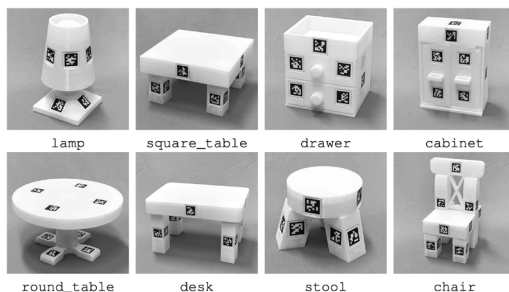
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Objective

This project aims to develop methods to learn to solve long horizon control tasks like furniture assembly. This class of tasks is difficult to automate because it requires a combination of dextrous manipulation skills, perception and non-trivial state reasoning.

Project Details

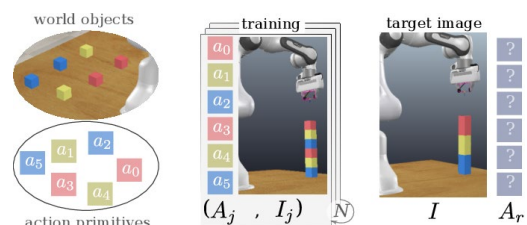


This work will explore deep learning architectures that enable this, using furniture bench, a simplified real world assembly challenge. Students on this project will develop deep learning models in simulation and on the real world challenge that learn to solve a range of complex furniture assembly tasks.

Heo, Minh, et al. "FurnitureBench: Reproducible Real-World Benchmark for Long-Horizon Complex Manipulation." arXiv preprint arXiv:2305.12821 (2023).

This will build on prior work in sequential action sequencing using transformer like architectures.

Burke, Michael, Kartic Subr, and Subramanian Ramamoorthy. "Action sequencing using visual permutations." IEEE Robotics and Automation Letters 6.2 (2021): 1745-1752.



Prerequisites

Excellent python programming skills, preferably taken units in machine learning, neural networks or control systems/optimisation. Familiarity with pytorch would be valuable.

Additional Information

Applicants should email me for further information and to discuss projects, and may be required to attend an interview.