Hien Bui

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Research Focus: Model-based control and learning for contact-rich robotic manipulation, with an emphasis on real-time contact-implicit MPC and data-efficient learning of task-relevant reduced-order models.

Technical Skills

Programming Languages: Python, C/C++
Robotics Software: Drake, Mujoco, ROS
Robots: Denso, Franka Panda, Univeral Robots, TriFinger
Developer Tools: Bazel, Git, Linux, Docker
Libraries: Pytorch, JAX, CasADi

Experience

Graduate Researcher — Philadelphia, PA
GRASP Lab (General Robotics, Automation, Sensing & Perception Lab) — August 2021 – Present

- Developed real-time model predictive control with multi-contact reasoning for non-prehensile manipulation
- Developed data-efficient methods to improve task performance of learned reduced-order models via reinforcement learning for dexterous manipulation and legged locomotion
- Built, integrated, and maintained the TriFinger platform, an open-source multi-fingered robotic system for dexterous manipulation

Robotics Engineer (Founding Engineer) — Singapore
Eureka Robotics — July 2018 – June 2021

- Designed, integrated, and deployed multiple award-winning high-accuracy and high-agility robotics systems, including Archimedes Robot and Pytagoras Robot, the first industrially-deployed robots to achieve 80-micron accuracy in an unstructured environment
- Implemented various high-performance motion planning and control algorithms for robot manipulation tasks

Education

University of Pennsylvania — Philadelphia, PA
Ph.D. Student in Robotics at GRASP Lab — Aug. 2021 – Present
Advisor: Michael Posa

University of Pennsylvania — Philadelphia, PA
Master's Degree in Robotics — Dec. 2024

Nanyang Technological University — Singapore
Bachelor's Degree in Mechanical Engineering with Highest Distinction — Aug. 2014 – May 2018

Selected Publications

- **Push Anything: Single- and Multi-Object Pushing From First Sight with Contact-Implicit MPC**
  Hien Bui*, Yufeiyang Gao*, Haoran Yang*, Eric Cui, Siddhant Mody, Brian Acosta, Thomas Stephen Felix, Bibit Bianchini, Michael Posa. *Under Review*

- **Active Tactile Exploration for Rigid Body Pose and Shape Estimation**
  Ethan K Gordon, Bruke Baraki, **Hien Bui**, Michael Posa. *Under Review*

- **Enhancing Task Performance of Learned Simplified Models via Reinforcement Learning**
  Hien Bui, Michael Posa. *IEEE International Conference on Robotics and Automation (ICRA 2024)*

- **Reinforcement Learning for Reduced-order Models of Legged Robots**
  Yu-Ming Chen, **Hien Bui**, Michael Posa. *IEEE International Conference on Robotics and Automation (ICRA 2024)*