Curriculum Vitae

Haolun (Harry) Zhang

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Education

August 2021—Present	**Degree:**	Master of Science in Robotics
	Institution:	Carnegie Mellon University Robotics Institute
	GPA:	4.0 of 4.0
	Expected graduation in August 2023	

August 2017—May 2021	**Degree:**	Bachelor of Science in Electrical Engineering & Computer Science
	Institution:	University of California, Berkeley
	GPA:	3.9 of 4.0
	Graduated with High Honors and Department Award for Designs. Minor in Mechanical Engineering	

Research Experience

May 2022—August 2022	**Lab:**	Amazon AI Research, San Francisco
	Interests:	TBD
	Advisors:	TBD
	Experience:	

- TBD

August 2021—Present	**Lab:**	Carnegie Mellon University, Robotics Institute
	Interests:	Robot learning, representation learning, 3D vision
	Advisors:	Prof. David Held
	Experience:	

- Research on representation learning methods for fast policy transfer in learning-from-demonstration problems.
- Devise policy learning and transfer learning frameworks for complex articulated objects manipulation tasks.

April 2019—May 2021	**Lab:**	Berkeley AI Research
	Interests:	Robot learning, vision, control theory
	Advisors:	Prof. Ken Goldberg, Dr. Jeffrey Ichnowski
	Experience:	

- Research on deep learning, computer vision, control theory, and their applications in robot learning.
- Research projects involve efficient 6-DoF grasping, dynamic deformable objects manipulation, visuomotor control, and 3D vision.

Publications

Ben Eisner*, **Harry Zhang***, David Held, "FlowBot3D: Learning 3D Articulation Flow to Manipulate Articulated Objects". *Robotics: Science and Systems (RSS)*, June 2022.

Harry Zhang*, Huang Huang*, Bobby Yan*, "Safe Deep Model-Based Reinforcement Learning with Lyapunov Functions". *International Conference on Machine Learning (ICML)*, July 2022 (Under Review).

Yahav Avigal*, Vishal Satish*, **Harry Zhang**, Huang Huang, Michael Danielczuk, Jeffrey Ichnowski, Ken Goldberg, "AVPLUG: Approach Vector Planning for Unicontact Grasping amid Clutter". *IEEE Conference on Automation Science and Engineering (CASE),* August 2021.

Harry Zhang, Jeffrey Ichnowski, Daniel Seita, Jonathan Wang, Ken Goldberg, "Robots of the Lost Arc: Learning to Dynamically Manipulate Fixed-Endpoint Ropes and Cables". *IEEE International Conference on Robotics and Automation (ICRA)*, June 2021.

Shivin Devgon, Jeffrey Ichnowski, Ashwin Balakrishna, **Harry Zhang**, Ken Goldberg, "Orienting Novel 3D Objects Using Self-Supervised Learning of Rotation Transforms". *IEEE Conference on Automation Science and Engineering (CASE),* August 2020.

Harry Zhang, Jeffrey Ichnowski, Yahav Avigal, Joseph E. Gonzalez, Ion Stoica, Ken Goldberg, "Dex-Net AR: Distributed Deep Grasp Planning Using an Augmented Reality Application and a Smartphone Camera". *IEEE International Conference on Robotics and Automation (ICRA)*, June 2020.

Tech Reports

Harry Zhang, Yahav Avigal, Samuel Paradis, "6-DoF Grasp Planning using Fast 3D Reconstruction and Grasp Quality CNN". *ArXiv*, 2020

Harry Zhang, Priya Sundaresan, Aditya Ganapathi, Shivin Devgon, "Deep Correspondence Matching for Deformable Objects". *ArXiv*, 2019

Talks

Dex-Net AR Interview. *VentureBeat, Berkeley, CA*, June 2020.

Personal Projects

- **Open Source Deep RL Book.** Wrote a collection of notes on Deep Reinforcement Learning. Maintain and curate the notes on an open source repository, with 28 stars on Github. The book now is being extensively used in Berkeley's Deep RL course. *2019 - Present.*

- **Lyapunov-Constrained Safe Model-Based RL**. Investigate Lyapunov constraints to give better convergence guarantees for safety-augmented deep model-based RL algorithms such as SAVED and ABC-LMPC. *2020 - 2021*

Selected Coursework

- **CMU**. Intermediate Statistics *(36-700)*, Graduate Optimization *(10-725)*, Probabilistic Graphical Models *(10-708)*, Kinematics, Dynamics, and Control *(16-711)*

- **Berkeley**. Deep Reinforcement Learning *(CS 285)*, Linear Systems Theory *(EE 221)*, Nonlinear Systems Theory *(EE 222)*, Computer Vision *(CS 280)*, 3D Vision *(EE 290)*, Convex Optimization *(EE 127)*, Machine Learning *(CS 189)*, Artificial Intelligence *(CS 188)*, Model Predictive Control *(ME 231A)*, Advanced Robotics *(CS 287)*, Deep Learning *(CS 182)*.

Teaching

CMU: Head TA for Computer Vision, TA for Graduate Convex Optimization.

Berkeley: TA for Undergraduate CS Theory, Convex Optimization, Machine Learning.

Outreach and Service

- **5x ICRA reviewer.**

- **5x IROS reviewer.**

- **3x CASE reviewer.**

- **Berkeley AI Research Blog Curator.** Helped coordinate and maintain BAIR Blog and website.

- **Berkeley AI4ALL Co-Organizer.** Organized AI4ALL-Berkeley crash courses, and designed a 2-day project on computer vision for high school students.

- **Berkeley AI Research Ambassador.** Hosted lab tours and robot demos for middle school and high school students.

Honors and Awards

- Citadel Data Open East Coast Second Place (2021)

- Warren Y. Dere Design Award (2 chosen out of 1800 graduating seniors, 2021)

- 6 Times UC Berkeley Dean's List (Top 10%, 2017-2021)

- Electrical Engineering Honor Society Eta Kappa Nu Member (Top 20%, 2019)

- Engineering Honor Society Tau Beta Pi Member (Top 15%, 2019)

- Mechanical Engineering Honor Society Pi Tau Sigma Member (Top 20%, 2018)

- Kraft Award for Freshmen Recipient (Top 1%, 2017)

- AAPT Physics Bowl Competition US National Rank 24 in Division I (2016).

Relevant Skills

- **Physical Robots:** Experience with Sawyer, Franka Panda, UR5, YuMi, and Fetch.

- **Libraries:** Experience with matplotlib, Numpy/Scipy, various OpenAI libraries (gym, baselines, etc.), OpenCV, ROS, TensorFlow, PyTorch, PyBullet, Blender (for graphics rendering).

- **Programming:** Python, Java, C, C++, MATLAB.

- **Languages:** Fluent in Mandarin, English. Intermediate in Spanish

- **Other skills:** Google Cloud, docker, LaTeX, Ubuntu, vim