Curriculum Vitae

Haolun (Harry) Zhang

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Education

August 2023—Present
Degree: PhD in Statistics and AeroAstro
Institution: Massachusetts Institute of Technology (MIT)
GPA: 5.0 of 5.0

August 2021—May 2023
Degree: Master of Science in Machine Learning and Robotics
Institution: Carnegie Mellon University (CMU)
GPA: 4.0 of 4.0
Received Siebel Scholar nomination.

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

Academic Appointments

August 2023—Present
Lab: MIT Laboratory for Information & Devision Systems (LIDS)
Interests: TBD
Advisors: Prof. Luca Carlone
Experience:

- Self-supervised learning, certifiable autonomous systems, robust estimation for perception

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

- Research on visual representation learning methods for fast policy transfer in learning-from-demonstration problems.
- Devise visuomotor policy and skills learning and transfer learning frameworks for complex 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.

Professional Appointments

May 2023— August 2023

Company: Amazon Robotics, Boston
Position: Applied Research Scientist II Intern (Level 5)
Advisors: TBD
Experience:

- TBD

May 2022— August 2022

Company: Amazon.com, Inc., San Francisco
Position: Applied Research Scientist II Intern (Level 5)
Advisors: Dr. Benjamin Biggs, Dr. Achal Dave
Experience:

- Design next-generation 3D Virtual Try-On (VTO) deep learning model for Amazon Style Physical Store.
- Investigate generative models for virtual try-on and animatable deep 3D human models.

Peer-Reviewed Publications

Harry Zhang, Achal Dave, Gerard Medioni, Benjamin Biggs, "Strike a Pose: 3D Reposing for 2D Virtual Try-On". *Amazon Machine Learning Conference, 2023.*

Brian Okorn*, Chu Er Pan*, **Harry Zhang***, Benjamin Eisner*, David Held, "TAX-Pose: Task-Specific Cross-Pose Estimation for Robot Manipulation". *Conference on Robot Learning (CoRL)*, 2022 (* indicates equal contribution).

Ben Eisner*, **Harry Zhang***, David Held, "FlowBot3D: Learning 3D Articulation Flow to Manipulate Articulated Objects". *Robotics: Science and Systems (RSS)*, June 2022 (* indicates equal contribution) - Best Paper Award Finalist (selection rate 1.5%).

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.

Preprints & Tech Reports

Harry Zhang*, Benjamin Biggs*, Achal Dave, "Strike a Pose: Animating Virtual Try-On". *Under Review*, 2022.

Harry Zhang*, Huang Huang*, Bobby Yan*, "Safe Deep Model-Based Reinforcement Learning with Lyapunov Functions". *Under Review*, 2022.

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

Learning for Robotics Tech Talk. *Neurocean, Hangzhou, China*, July 2022.

FlowBot 3D Interview. *MIT Tech Review, China*, April 2022.

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 1000+ stars on Github. The book is now 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)*, Cooperative AI (*15-763*).
- **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, Head TA for Advanced Convex Optimization.

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

Outreach and Service

- **Reviewer for IEEE ICRA, IEEE IROS, IEEE CASE, CoRL.**
- **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

- Siebel Scholars Nomination (2022)
- 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).
- Concours Lépine Européen de Strasbourg - Médailles d'Or / Gold Medal in Concours Lépine Invention Competition of France (2016).
- Chinese Mathematics Olympiad Bronze Medal (2015).

Relevant Skills

- **Libraries:** Experience with Matplotlib, Numpy/Scipy, Pandas, Scikit-Learn, various OpenAI libraries (gym, baselines, etc.), OpenCV, ROS, TensorFlow, PyTorch, PyBullet, Blender.
- **Programming:** Python, Java, C, C++, MATLAB.
- **Languages:** Fluent in Mandarin, English. Intermediate in Spanish.
- **Physical Robots:** Experience with Sawyer, Franka Panda, UR5, YuMi, and Fetch.
- **Other skills:** Google Cloud, Docker, AWS, LaTeX, Ubuntu, Vim.