Hejia Zhang

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Education

Ph.D. in Computer Science, University of Southern California *01/2020 – 05/2024*
Advisor: Prof. Stefanos Nikolaidis
M.S. in Computer Science, University of Southern California *01/2018 – 12/2019*
Advisor: Prof. Stefanos Nikolaidis & Prof. Gaurav Sukhatme
B.E. in Bioengineering, Zhejiang University *2017*

Professional Experience

Software Engineer, *Seetatech Technology Co., Ltd, Beijing, China*. *06/2017 – 12/2017*

Publications

Under review

[U1] Vedant Raval‡, Enyu Zhao‡, **Hejia Zhang**, Stefanos Nikolaidis, Daniel Seita. **GPT-Fabric: Folding and Smoothing Fabric by Leveraging Pre-Trained Foundation Models**. *Under review*.

Journals

[J3] **Hejia Zhang**, Shao-Hung Chan, Jie Zhong, Jiaoyang Li, Peter Kolapo, Sven Koenig, Zach Agioutantis, Steven Schafrik, Stefanos Nikolaidis. **Multi-Robot Geometric Task-and-Motion Planning for Collaborative Manipulation Tasks**. *Autonomous Robots (AURO)*, 2023.

[J2] Ryan Julian, Eric Heiden, Zhangpeng He, **Hejia Zhang**, Stefan Schaal, Joseph J. Lim, Gaurav S. Sukhatme, Karol Hausman. **Scaling Simulation-to-Real Transfer by Learning a Latent Space of Robot Skills**. *International Journal of Robotics Research (IJRR)*, Vol 39, Issue 10–11, 2020.

[J1] Chaoyang Zhu, Kejie Huang, Shuyuan Yang, Ziqi Zhu, **Hejia Zhang**, Haibin Shen. **An Efficient Hardware Accelerator for Structured Sparse Convolutional Neural Networks on FPGAs**. *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, Vol 28, Issue 9, 2020.

Conferences

[C6] Varun Bhatt, Heramb Nemlekar, Matthew C. Fontaine, Bryon Tjanaka, **Hejia Zhang**, Ya-Chuan Hsu, Ste–fanos Nikolaidis. **Surrogate Assisted Generation of Human-Robot Interaction Scenarios**. *In Conference on Robot Learning (CoRL), 2023.* (Oral Presentation; 6.6% acceptance rate).

[C5] Shivin Dass‡, Karl Pertsch‡, **Hejia Zhang**, Youngwoon Lee, Joseph J. Lim, Stefanos Nikolaidis. **PATO: Policy Assised TeleOperation for Scalable Robot Data Collection**. *In Robotics: Science and Systems (R:SS)*, 2023.

[C4] **Hejia Zhang**, Shao-Hung Chan, Jie Zhong, Jiaoyang Li, Sven Koenig, Stefanos Nikolaidis. **A MIP-Based Approach for Multi-Robot Geometric Task-and-Motion Planning**. *In The 18th IEEE International Conference on Automation Science and Engineering (CASE)*, 2022.

[C3] **Hejia Zhang**‡, Matthew C. Fontaine‡, Amy Hoover, Julian Togelius, Bistra Dilkina, Stefanos Nikolaidis. **Video Game Level Repair via Mixed Integer Linear Programming**. *In The 16th AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-20)*, 2020. (Oral Presentation; 25% acceptance rate).

[C2] **Hejia Zhang**, Po-Jen Lai, Sayan Paul, Suraj Kothawade and Stefanos Nikolaidis. **Learning Collaborative Action Plans from Unlabeled Youtube Videos**. *In International Symposium on Robotics Research (ISRR)*, 2019.

[C1] Ryan Julian‡, Eric Heiden‡, Zhangpeng He, **Hejia Zhang**, Stefan Schaal, Joseph J. Lim, Gaurav S. Sukhatme, Karol Hausman. **Scaling simulation-to-real transfer by learning composable robot skills**. *Presented at International Symposium on Experimental Robotics (ISER)*, 2018.

Workshops and Abstracts

[W6] Varun Bhatt, Heramb Nemlekar, Matthew Christopher Fontaine, Bryon Tjanaka, **Hejia Zhang**, Ya-Chuan Hsu, Stefanos Nikolaidis. **Surrogate Assisted Generation of Human-Robot Interaction Scenarios**. *In Robotics: Science and Systems (R:SS) Workshop on Environment Generation for Generalizable Robots*, 2023.

[W5] Shivin Dass, Karl Pertsch, **Hejia Zhang**, Youngwoon Lee, Joseph J. Lim, Stefanos Nikolaidis. **Assisted Teleoperation for Scalable Robot Data Collection**. *In Conference on Robot Learning (CoRL) Workshop on Pre-training Robot Learning*, 2022.

[W4] **Hejia Zhang**, Shao-Hung Chan, Jie Zhong, Jiaoyang Li, Sven Koenig, Stefanos Nikolaidis. **A MIP-Based Approach for Multi-Robot Geometric Task-and-Motion Planning**. *In Southern California Robotics Symposium (SCR)*, 2022.

[W3] **Hejia Zhang** and Stefanos Nikolaidis. **Robot Learning Collaborative Manipulation Plans from YouTube Cooking Videos**. *In Robotics: Science and Systems (R:SS) Workshop on Emergent Behaviors in Human-Robot Systems*, 2020.

[W2] **Hejia Zhang**, Eric Heiden, Stefanos Nikolaidis, Joseph J. Lim, and Gaurav S. Sukhatme. **Auto-conditioned Recurrent Mixture Density Networks for Learning Generalizable Robotic Manipulation Skills**. *In Southern California Robotics Symposium (SCR)*, 2019.

[W1] Zhanpeng He[‡], Ryan Julian[‡], Eric Heiden, **Hejia Zhang**, Stefan Schaal, Joseph J. Lim, Gaurav S. Sukhatme, Karol Hausman. **Simulator Predictive Control: Using Learned Task Representations and MPC for Zero-Shot Generalization and Sequencing**. *Presented at Conference on Neural Information Processing Systems (NeurIPS) Deep Reinforcement Learning Workshop*, 2018.

Technical Reports

[T4] Steven Schafrik (PI), Zach Agioutantis (Co-PI), Stefanos Nikolaidis (Co-PI), Peter Kolapo, Anastasia Xenaki, **Hejia Zhang** (led the robot motion programming, human-machine interface design and programming). **Roof Bolting Module Automation for Enhancing Miner Safety**. *Alpha Foundation for the Improvement of Mine Safety and Health.*

[T3] **Hejia Zhang**, Jie Zhong, Stefanos Nikolaidis. **Zero-Shot Imitating Collaborative Manipulation Plans from YouTube Cooking Videos**. *In ArXiv.*

- **Paper of the Month** by Kinova Robotics.

[T2] Eric Heiden[‡], David Millard[‡], **Hejia Zhang** and Gaurav S. Sukhatme. **Interactive Differentiable Simulation**. *In ArXiv.*

[T1] **Hejia Zhang**, Eric Heiden, Stefanos Nikolaidis, Joseph J. Lim, and Gaurav S. Sukhatme. **Auto-conditioned Recurrent Mixture Density Networks for Learning Generalizable Robot Skills**. *In ArXiv.*

Hands-On Demonstrations

[D1] Eura Shin, **Hejia Zhang**, Rey J Pocius, Nathaniel Dennler, Heather Culbertson, Naghmeh Zamani and Stefanos Nikolaidis. Robot-assisted hair-brushing. *Presented at Conference on Neural Information Processing Systems (NeurIPS)*, 2019.

Honors and Awards

OpenAI Researcher Access Program Grant *2024*
CoRL Travel Award *2023*
Oral Presentation, AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment *2020*
Viterbi MS Best Research Award, USC *2019*
NeurIPS Travel Award *2019*
ZJU Merit-based UG Scholarship *2015 – 2016*
ZJU Merit-based UG Scholarship *2013 – 2014*

Teaching

Robotics (CSCI 545), University of Southern California. *Spring 2024*
Teaching Assistant, Content Contributor, Guest Lecturer

Robotics (CSCI 545), University of Southern California. *Fall 2023*
Teaching Assistant, Content Contributor, Guest Lecturer

Introduction to Machine Learning (CSCI 467), University of Southern California. *Fall 2022*
Teaching Assistant, Discussion Organizer

Introduction to Programming (CSCI 103L), University of Southern California. *Spring 2021*
Teaching Assistant

Robotics (CSCI 545), University of Southern California. *Fall 2020*
Teaching Assistant, Content Contributor, Guest Lecturer

Introduction to Artificial Intelligence (CSCI 360), University of Southern California. *Spring 2020*
Teaching Assistant, Guest Speaker

Mentoring

Vedant Sanjaykumar Raval (MS student at USC).
Foundation Models for Robotics.

Enyu Zhao (MS student at USC).
Foundation Models for Robotics.

Chengyu Deng (UG student at Tsinghua University, USC-Tsinghua Summer Research Program).
Learning-guided geometric task-and-motion planning.

Zhenghui Su (MS student at USC).
Learning-guided geometric task-and-motion planning.

Peter Wang (UG student at USC, Provost's Research Fellowship awardee).
Learning-guided geometric task-and-motion planning.

Jie Zhong (MS student at USC).
Multi-robot geometric task-and-motion planning, (CASE 2022, AURO 2023).

Zechen Wang (UG student at USC).
Assisted teleoperation for scalable robot data collection, (RSS 2023).

Ruth Berkun (HS student mentoring through the USC Viterbi SHINE program).
Commensense knowledge learning from language corpus.

Services

Reviewer: IROS, ICRA, CASE, HRI, NeurIPS (Demo Track), THRI, RA-L, T-RO, AURO.
Volunteer: CoRL 2023.

Media Coverage

Learning Collaborative Robot Plans from YouTube Videos: Paper of the Month by Kinova Robotics.
Robotic Hair Brushing: Fortune.

Outreach

USC Viterbi SHINE program *Summer 2020*
Research Mentor

USC-Tsinghua Summer Research Program *Summer 2023*
Research Mentor