Kelin Yu

Ph.D. Student in Computer Science, University of Maryland
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Education

University of Maryland, College Park Aug. 2024–Present
Ph.D. in Computer Science
Advisor: Prof. Ruohan Gao; closely collaborating with Profs. Yiannis Aloimonos and Pratap Tokekar

Georgia Institute of Technology Aug. 2022–May 2024
M.S. in Computer Science, Robotics
Advised by Yunhai Han and Profs. Ye Zhao and Danfei Xu

Georgia Institute of Technology Aug. 2019–May 2022
B.S. in Electrical Engineering and B.S. in Mathematics; Minor in Robotics
Graduated with Highest Honor

Research Interests and Skills

- **Research:** Multisensory robot learning, tactile sensing and control, learning from cross-embodiment human videos, reinforcement learning, imitation learning, and contact-rich manipulation.
- **Modalities:** Vision, tactile sensing, audio, force/torque sensing, and language.
- **Tools:** PyTorch, TensorFlow, ROS, OpenCV, Open3D, MATLAB, and real-world robotic systems.

Publications

* indicates equal contribution. Names of undergraduate mentees are marked with †.

[1] **OmniTacTune: Policy-Agnostic Real-World RL for Tactile Residual Adaptation of Visual Policies**
Kelin Yu*, Haode Zhang*†, Harish Ravichandar, Yunhai Han, Ruohan Gao.
Conference on Robot Learning (CoRL), 2026.
RSS Workshop on Tactile Sensing for Robotic Foundation Models, 2026. **Best Paper Award**.
Paper | Website | Video

[2] **ControlTac: Scaling Tactile Data with Physically Controlled Tactile Image Generation**
Dongyu Luo*†, **Kelin Yu***, Amir-Hossein Shahidzadeh, Cornelia Fermüller, Yiannis Aloimonos, Ruohan Gao.
Conference on Robot Learning (CoRL), 2026.
ICCV Workshop on Compositional and Generative Models in Computer Vision, 2025. **Oral Presentation**.
Paper | Website

[3] **GenFlowRL: Shaping Rewards with Generative Object-Centric Flow in Visual Reinforcement Learning**
Kelin Yu*, Sheng Zhang*, Harshit Soora, Furong Huang, Heng Huang, Pratap Tokekar, Ruohan Gao.
IEEE/CVF International Conference on Computer Vision (ICCV), 2025.
ICRA Workshop on Foundation Models and Neural-Symbolic Learning, 2025. **Spotlight and Best Paper Nomination**.
Paper | Website

[4] **MimicTouch: Leveraging Multimodal Human Tactile Demonstrations for Contact-Rich Manipulation**
Kelin Yu*, Yunhai Han*, Qixian Wang, Vaibhav Saxena, Danfei Xu, Ye Zhao.
Conference on Robot Learning (CoRL), 2024.
NeurIPS Touch Processing Workshop, 2023. **Best Paper Award**.
CoRL Deployable Workshop, 2023.
Paper | Website

[5] **Continual Robot Learning via Language-Guided Skill Acquisition**
Zhaoyi Li*, **Kelin Yu***, Shuo Cheng*, Danfei Xu.
Transactions on Machine Learning Research (TMLR), 2026; presented at NeurIPS 2026.

J2C Certification, Top 6.3%, Transactions on Machine Learning Research, 2026.
OpenReview | Website

[6] **Learning Generalizable Vision-Tactile Robotic Grasping Strategy for Deformable Objects via Transformer**
Yunhai Han*, **Kelin Yu***, Rahul Batra, Nathan Boyd, Chaitanya Mehta, Tuo Zhao, Yu She, Seth Hutchinson, Ye Zhao.
IEEE/ASME Transactions on Mechatronics, 2024.
Short version in the *IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*, 2023.
Paper | Code

[7] **SceneOrchestra: Efficient Agentic 3D Scene Synthesis via Full Tool-Call Trajectory Generation**
Yun He, **Kelin Yu**, Matthias Zwicker.
European Conference on Computer Vision (ECCV), 2026.

[8] **HumanEgo: Zero-Shot Robot Learning from Minutes of Human Egocentric Videos**
Zhi Wang, Botao He, **Kelin Yu**, Seungjae Lee, Ruohan Gao, Furong Huang, Yiannis Aloimonos.
In submission, 2026.
RSS RoboData Workshop, 2026. **Oral Presentation**.
IROS WORLDs Workshop, 2026. **Best Paper Award**.
Paper | Website

[9] **OdorSpaces: Visual-Olfactory Embodied Navigation in 3D Environments**
Changyeon Lee, **Kelin Yu**, Zheng Wei, Shuna Ni, Ruohan Gao.
Conference on Robot Learning (CoRL), 2026.

[10] **Afford2Act: Affordance-Guided Automatic Keypoint Selection for Generalizable and Lightweight Robotic Manipulation**
Anukriti Singh, Kasra Torshizi, Khuzema Habib, **Kelin Yu**, Ruohan Gao, Pratap Tokekar.
In submission, 2025.
Paper | Website

Professional Experience

Amazon, Industrial Robotics Group — Sunnyvale, CA
Research Intern — Jun. 2026–Present
Working with Prof. Nima Fazeli and Prof. Roberto Martin Martin.

- Research on tactile-aware policy learning and compliant control for contact-rich robot manipulation with force/torque and tactile sensing.
- Developed high-frequency tactile processing and adaptive manipulation control pipelines for real robot systems.

Amazon Robotics AI — Seattle, WA
Robotics Software Engineering Intern — May 2022–Aug. 2022

- Designed and deployed a calibration-drift detection system for industrial manipulators using Python, Open3D, OpenCV, machine learning, and AWS.
- Developed perception algorithms for detecting calibration failures from historical images and point clouds, potentially saving thousands of dollars per day.

EcoCAR Mobility Challenge — Atlanta, GA
Perception Engineer — Jul. 2021–May 2022

- Developed perception and sensor-fusion systems for a hybrid semi-autonomous Chevrolet Blazer in a national GM and U.S. Department of Energy competition.
- Led system verification, hardware-in-the-loop testing, sensor fusion, and data visualization.
- Won the **EcoCAR Mobility Challenge National Championship**.

Invited Talks and Presentations

- **Invited Talk**, Saturday Robotics: Contact-Rich Robot Learning from Human Videos & Tactile, Aug. 2026.
- **Invited Talk**, Shanghai Jiao Tong University, Oct. 2025.
- **Invited Talk**, University of Maryland Robotics Symposium, Apr. 2025.

- **Invited Oral Presentation**, NeurIPS Touch Processing Workshop, Dec. 2023.

Mentoring

- **Dongyu Luo**, undergraduate mentee, University of Hong Kong (now NUS CS Ph.D.), 2025–2026. Research on controllable tactile data generation; co-first author of ControlTac.
- **Haode Zhang**, undergraduate mentee, Shanghai Jiao Tong University (now CMU MSR), 2025–2026. Research on tactile residual reinforcement learning; co-first author of OmniTacTune.

Honors and Awards

- **Best Paper Award**, IROS WORLDs Workshop (HumanEgo), 2026.
- **Best Paper Award**, RSS Workshop on Tactile Sensing for Robotic Foundation Models, 2026.
- **Departmental Nomination**, Apple AI/ML Fellowship (Top 2, UMD CS), 2026.
- **Qualcomm Innovation Fellowship Finalist**, with Yunhai Han, 2026.
- **J2C Certification, Top 6.3%**, Transactions on Machine Learning Research, 2026.
- **Spotlight and Best Paper Nomination**, ICRA Workshop on Foundation Models and Neural-Symbolic Learning, 2025.
- Dean's Fellowship, University of Maryland, 2024–2026.
- **Best Paper Award**, NeurIPS Touch Processing Workshop, 2023.
- Conference on Robot Learning Travel Grant, 2023.
- EcoCAR Mobility Challenge National Champion, 2022.
- Graduated with Highest Honor, Georgia Institute of Technology, 2022.

Professional Service

Conference and Journal Reviewer

- International Conference on Learning Representations (ICLR), 2025–2026.
- European Conference on Computer Vision (ECCV), 2026.
- Conference on Robot Learning (CoRL), 2026.
- Neural Information Processing Systems (NeurIPS), 2024–2025.
- International Conference on Machine Learning (ICML), 2025.
- IEEE/CVF International Conference on Computer Vision (ICCV), 2025.
- Robotics: Science and Systems (RSS), 2025.
- IEEE International Conference on Robotics and Automation (ICRA), 2025.
- IEEE Robotics and Automation Letters (RA-L).
- CoRL Deployable Workshop, 2023.

Teaching Experience

- **Teaching Assistant**, CMSC 848M: Multimodal Computer Vision, University of Maryland, Spring 2025.
- **Teaching Assistant**, CMSC 421: Introduction to Artificial Intelligence, University of Maryland, Fall 2024.
- **Teaching Assistant**, CS 4476/6476: Computer Vision, Georgia Institute of Technology, Fall 2022–Spring 2024.
- **Teaching Assistant**, ECE 3741: Instrumentation and Electronics Laboratory, Georgia Institute of Technology, Spring 2021.