

Kelin Yu

Ph.D. in Computer Science, University of Maryland

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Education

University of Maryland, College Park

Ph.D. in Computer Science, Aug 2024 – present (Advised by Prof. Ruohan Gao)

Georgia Institute of Technology, Atlanta, GA

M.S. in Computer Science (Robotics), Aug 2022 – May 2024

B.S. in Electrical Engineering and Mathematics, Robotics Minor, Aug 2019 – May 2022

Graduated with Highest Honor

Research Interests and Skills

- **Robot Learning:** Learning from Human Videos, MultiSensory Robot Learning, Imitation Learning, Reinforcement Learning, Task & Motion Planning, Robot Manipulation
- **Multi-modal Perception:** Vision, Tactile, Audio, Large Language Models
- **Tools:** PyTorch, TensorFlow, ROS, OpenCV, Open3D, Matlab

Selected Publications

- **Yu, K.***, Zhang, S.*, Soora, H., Huang, F., Huang, H., Tokekar, P., Gao, R.
GenFlowRL: Shaping Rewards with Generative Object-Centric Flow in Visual Reinforcement Learning — Accepted to **ICCV 2025**; **Spotlight & Best Paper Nomination at ICRA Workshop**
- **Yu, K.***, Han, Y.*, Wang, Q., Saxena, V., Xu, D., Zhao, Y.
MimicTouch: Leveraging Multi-modal Human Tactile Demonstrations for Contact-rich Manipulation — Accepted to **CoRL 2024**; **Best Paper Award at NeurIPS Workshop 2023**
- Luo, D.*, **Yu, K.***, Shahidzadeh, A.-H., Fermüller, C., Aloimonos, Y., Gao, R. (Luo is my undergraduate mentee) ControlTac: Force- and Position-Controlled Tactile Data Augmentation with a Single Reference Image — In Submission; **ICCV CDEL Workshop ORAL**
- Han, Y.*, **Yu, K.***, Batra, R., Boyd, N., Zhao, T., She, Y., Hutchinson, S., Zhao, Y.
Learning Generalizable Vision-tactile Robotic Grasping Strategy for Deformable Objects via Transformer — Accepted to **IEEE/ASME Transactions on Mechatronics**
- Li, Z.*, **Yu, K.***, Cheng, S., Xu, D.
Continual Robot Learning via Language-Guided Skill Acquisition — Submitted to **IEEE RA-L**
- Singh, A., Torshizi, K., Habib, K., **Yu, K.**, Gao, R., Tokekar, P.
AFFORD2ACT: Affordance-Guided Automatic Keypoint Selection for Generalizable and Lightweight Robotic Manipulation — In Submission
- Zhang, S., **Yu, K.**, Zheng, T., Chen, G., Khan, S., Shen, Z., Huang, H.
From Dots to Web: Benchmarking and Probing Conceptual Structure in Multimodal LLM — In Submission

Research & Project Experience

ControlTac Project: Controllable Tactile Data Augmentation (In Submission)

- Generated tactile images from a single reference image conditioned on force and position.
- Enhanced robot performance in manipulation via controllable data augmentation.
- Received **ICCV Workshop Oral**.

GenFlowRL Project: Generative Flow-Guided Reward Modeling (ICCV 2025)

- Designed object-centric flow-based reward modeling from cross-embodiment datasets for visual RL.
- Achieved significant improvements in 10 challenging manipulation tasks.
- Received **ICRA Workshop Spotlight & Best Paper Nomination**.

MimicTouch Project: Human Tactile Strategy Learning (CoRL 2024)

- Built an end-to-end imitation learning framework via human tactile demonstrations.
- Achieved strong performance in contact-rich manipulation.
- Awarded **NeurIPS Workshop Best Paper**.

Continual Learning Project (RA-L)

- Employed large language models for task planning and reward generation.
- Constructed reusable skill libraries enabling continual robot learning.

Safe Deformable Grasping Project (T-Mech)

- Developed a vision-tactile Transformer framework for deformable object grasping.
- Enabled real-time detection of slippage and object damage.

Professional Experience

Amazon Robotics AI, Seattle, WA

Robotics Software Engineering Intern, May 2022 – Aug 2022

- Designed calibration drift detection system for manipulators using Python, Open3D, and OpenCV.
- Deployed AWS pipeline, saving potential **thousands of dollars everyday**.

EcoCAR Mobility Challenge, Atlanta, GA

Perception Engineer, Jul 2021 – May 2022

- Transformed Chevrolet Blazer into a hybrid semi-autonomous vehicle (GM & DOE collaboration).
- Led verification, HIL testing, sensor fusion, and data visualization.
- Won **National Champion** with a \$30,000 prize.

Honors & Awards

- **ICRA Workshop Spotlight & Best Paper Nomination**
- **NeurIPS Touch Workshop Best Paper Award (2023)**
- CoRL 2023 Travel Grant
- EcoCAR Mobility Challenge National Champion (\$30,000)
- UMD Dean's Fellowship
- Graduate with Highest Honor (Georgia Tech)

Teaching and Service

- Reviewer: ICLR 2025-2026, NeurIPS 2024-2025, ICML 2025, RSS 2025, ICRA 2025, ICCV 2025, RA-L
- Teaching Assistant: CMSC 848M Multi-modal Vision (UMD, Spring 2025);
CMSC 421 AI (UMD, Fall 2024);
CS 6476 Computer Vision (Georgia Tech, 2022-2024)