Yue Yang

🌐 https://yy-gx.github.io/ | 🎓 Google Scholar | ⌂ YY-GX | ✉ yygx@cs.unc.edu | 📱 +1(404)452-7437

Education

University of North Carolina at Chapel Hill, Chapel Hill NC   Expected May 2027
Ph.D. in Computer Science, College of Arts and Science.   **GPA**: 4.0/4.0

Georgia Institute of Technology, Atlanta GA   May 2023
Master of Science in Computer Science, College of Computing.   **GPA**: 3.9/4.0

Northeastern University, Shenyang China   June 2021
BEng in Software Engineering (pivot class).   **TOEFL**: 105 **GRE**: 327+4.0 **GPA**: 90/100

University of California San Diego, La Jolla CA   Dec 2019
Exchange student, School of Engineering.   **GPA**: 4.0/4.0

Publications & Preprints

IROS' 25	Yu Fang, **Yue Yang**, Xinghao Zhu, Kaiyuan Zheng, Gedas Bertasius, Daniel Szafir, Mingyu Ding, "ReBot: Scaling Robot Learning with Real-to-Sim-to-Real Robotic Video Synthesis", in submission to 2025 IEEE/RSJ International Conference on Intelligent Robots and Systems, 2025
IEEE T-FR (in submission)	Nicholas Conlon, Pawel Sawicki, **Yue Yang**, Nisar R. Ahmed, and Daniel Szafir, "Competency-Aware Collaborative Robotic Surface Exploration: A Study at the Mars Desert Research Station", in submission to IEEE Transactions on Field Robotics
HRI' 25 Late Breaking Reports	Chenyang Ma, **Yue Yang**, Bryce Ikeda and Daniel Szafir, "Supporting Long-Horizon Tasks in Human-Robot Collaboration by Aligning Intentions via Augmented Reality," in *the Late-Breaking Reports venue at HRI*, 2025
IEEE RA-L	**Yue Yang**, Linfeng Zhao, Mingyu Ding, Gedas Bertasius and Daniel Szafir, "BOSS: Benchmark for Observation Space Shift in Long-Horizon Task", in submission to IEEE Robotics and Automation Letters
IROS' 24	**Yue Yang**, Bryce Ikeda, Gedas Bertasius and Daniel Szafir, "ARCADE: Scalable Demonstration Collection and Generation via Augmented Reality for Imitation Learning," in Proceedings of the 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems, 2024
HRI' 24 VAM Workshop	**Yue Yang**, Bryce Ikeda, Gedas Bertasius and Daniel Szafir, "Augmented Reality Demonstrations for Scalable Robot Imitation Learning," in *7th International Workshop on Virtual, Augmented, and Mixed-Reality for Human-Robot Interactions*, 2024
HRI' 24	**Yue Yang***, Letian Chen*, Zulfiqar Zaidi*, Sanne van Waveren, Arjun Krishna and Matthew Gombolay, "Enhancing Safety in Learning from Demonstration Algorithms via Control Barrier Function Shielding", in *Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction*, 2024
The Visual Computer (in submission)	**Yue Yang***, Atith N Gandhi* and Greg Turk, "Annotated Hands for Generative Models", in *arXiv preprint arXiv:2401.15075*, 2024
CoRL' 22 LAR Workshop	**Yue Yang**, Letian Chen and Matthew Gombolay, "Safe Inverse Reinforcement Learning via Control Barrier Function," in *Proceedings of CoRL Learning for Agile Robotics workshop*, 2022
Preprint	**Yue Yang** and Pengtao Xie, "Discriminative Cross-Modal Data Augmentation for Medical Imaging Applications", *arXiv preprint arXiv:2010.03468*, 2020

EMNLP' 20	Guangtao Zeng, Wenmian Yang, Zeqian Ju, **Yue Yang**, Sicheng Wang, Ruisi Zhang, Meng Zhou, Jiaqi Zeng, Xiangyu Dong, Ruoyu Zhang, Hongchao Fang, Penghui Zhu, Shu Chen, and Pengtao Xie, "MedDialog: Large-scale medical dialogue dataset," in *Proceedings of the Conference on Empirical Methods in Natural Language Processing,* 2020
Preprint	Xuehai He*, Xingyi Yang*, **Yue Yang**, Ruofan Guo, Yuxiao Liang, Shanghang Zhang, Li Du, and Pengtao Xie, "Supervised Pretraining or Self-supervised Pretraining? A Tale of Two Transfer Learning Paradigms", *arXiv preprint arXiv:2007.04234,* 2020.

Selected Research Projects

Benchmark for Observation Space Shift in Long-Horizon Task   2024
Graduate Research Assistant, Co-Advisors: Dr. Daniel Szafir, Dr. Gedas Bertasius   UNC-CH
- Formulated the Observation Space Shift (OSS), a critical problem in long-horizon robotic tasks.
- Introduced BOSS, a comprehensive benchmark that evaluates four visual-input IL methods (BC-RNN, BC-Transformer, BC-Vilt, OpenVLA) across three increasingly challenging scenarios of OSS in long-horizon manipulation.
- Created a large and diverse dataset with the proposed Rule-based Automatic Modification Generator, demonstrating that data augmentation alone is insufficient to mitigate the OSS problem, emphasizing the need and room for algorithmic solutions in future research.

Scalable Demonstration Collection and Generation via AR   2023 - 2024
Graduate Research Assistant, Co-Advisors: Dr. Daniel Szafir, Dr. Gedas Bertasius   UNC-CH
- Aimed to solve two challenges in Imitation Learning: (1) complex process of demonstration collection; (2) data hungry, where a large set of demonstrations are required for an effective IL training.
- Proposed the ARCADE framework to address (1) by utilizing Augmented Reality (AR) to capture a single demonstration in a user-friendly way, and (2) by autonomously generating additional demonstrations with minimal user intervention.
- Applied ARCADE to address three fundamental tasks: 3-Waypoints-Reach, Push, Pick-And-Place alongside the more intricate real household task, Pouring-Water. ARCADE demonstrated excellent performance across all tasks, outperforming the baseline method of kinesthetic teaching.

Safe Inverse Reinforcement Learning via Control Barrier Function   2022 - 2023
Graduate Research Assistant, Advisor: Dr. Matthew Gombolay   Georgia Institute of Technology
- Studied the safety issue of inverse reinforcement learning (IRL).
- Proposed a novel framework, SECURE, which learns a customized Control Barrier Function (CBF) from end-users that prevents robots from taking unsafe actions while imposing little interference with the task completion.
- Applied SECURE on two simulated robotic and autonomous driving tasks, and a real-world knife-cutting, meal-preparation task, where SECURE achieves much safer performance in all experiments. Also, we demonstrated in a user study that non-roboticists can use SECURE to effectively teach the robot safe policies that avoid collisions with the person and prevent coffee from spilling.

Annotated Hands for Generative Models   2022
Graduate Research Assistant, Advisor: Dr. Greg Turk   Georgia Institute of Technology
- Aimed to mitigate the limitations of popular generative models (e.g., GANs, Diffusion Models) in synthesizing realistic human-like hand images.
- Proposed a novel lifelike hand synthesis pipeline with deep generative models via leveraging additional information (e.g., keypoints of hands, dorsal or ventral, left or right).
- Demonstrated our method both on a new synthetic dataset of hand images and also on real photographs that contain hands. We measured the improved quality of the generated hands through higher confidence in finger joint identification using an off-the-shelf hand detector.

Anytime Bounded Conflicted-Based Search for Dynamic Environments   [More Details]   2020
Research Assistant, Advisor: Dr. Jia Pan   University of Hong Kong

- Enhanced centralized multi-agent path finding (MAPF) via leveraging the accurate decentralized perception of dynamic obstacles positions.
- Proposed a novel low-level Focal Search algorithm to consider the dynamic obstacles and unpredictable events in real-world situations.
- Funded by the computer science internship program of Hong Kong University.

Discriminative Cross-Modal Data Augmentation   [More Details]   2020
Research Assistant, Advisor: Dr. Pengtao Xie   University of California San Diego
- Aimed to mitigate the data deficiency issue in medical imaging in a cross-modal way.
- Proposed a discriminative unpaired image-to-image translation framework, DUIIT, to perform cross-modality data augmentation.
- Applied DUIIT on three different modalities and achieved better physiological age prediction performance than baselines.

Industry Experience

Water-Mirror, *Robotic Algorithm Engineer Intern*   Sep 2020 - Nov 2020
- Deployed anytime and bounded CBS algorithm to intelligent warehouse management, which required up to 100 robots path planning.
- Proposed algorithm showed much faster calculation speed($\sim 90\%$) and higher successful rate($\sim 50\%$) compared to traditional multi-agent path finding methods(e.g., CBS, WHCA*, etc.).
- Implemented the algorithm in Python and C++, and integrated an API for seamless interaction with the company's system.

Neusoft Corporation, *Software Development Engineer Intern*   Jul 2020 - Aug 2020
- Rebuilt a storage system with AWS RDS, S3, and CloudFront from local storage for non-structural data like pictures, texts, and labels. Successfully improved the loading speed of static resources and reduced system load.
- Developed micro-services based on Spring Boot framework for user and product information management, connected with Oauth2 authentication server to verify token as well, deployed to EC2 server.
- Configured deployment automation for microservices by using Docker and Jenkins.

Awards and Honors

- First Prize winner of "The NXP Cup National University Students Intelligent Car Race", 2019
- Second-Class Scholarship, Northeastern University (Top 5%), 2018 & 2019