Yue Yang

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Research Interests

Robotics, **Machine Learning**, and their application to **Human Robot Interaction**

Education

Georgia Institute of Technology, Atlanta GA Expected 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, San Diego CA Dec 2019
Exchange student, School of Engineering. **GPA**: 4.0/4.0

Publications & Preprints

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.

Research Experience

Safe Inverse Reinforcement Learning via Control Barrier Function [More Details] 2022
Graduate Research Assistant, Advisor: Dr. Matthew Gombolay Georgia Institute of Technology
- Studied the possible safety problem of inverse reinforcement learning (IRL) during deployment.
- Proposed a novel IRL framework, CBFIRL, to enhance the safety of the IRL policy via leveraging the Control Barrier Function (CBF).
- Applied CBFIRL on two virtual robotic control domains and achieved safer performance.

Lifelike Hand Synthesis with Deep Generative Models [More Details] 2022
Graduate Research Assistant, Advisor: Dr. Greg Turk Georgia Institute of Technology
- Worked on the difficulty of synthesizing human-like hand images for popular generative models (e.g., GAN, Diffusion Models).
- 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, etc.).
- Achieved successful preliminary results with the correct number and position of fingers.

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.

Comparison between Transfer Learning and Self-supervised Learning [More Details] 2020
Research Assistant, Advisor: Dr. Pengtao Xie University of California San Diego
- Worked on the selection of pre-training methods between supervised pre-training and self-supervised pre-training.
- Designed various experiments to study factors that affect the comparison of these two pre-training methods. Factors include domain difference, the amount of training data, class imbalance in source tasks, and using target data for additional pre-training.
- Provided six insights to guide the selection of pre-training methods for future researchers.

Creation of Medical Dialogue Dataset [More Details] 2020
Research Assistant, Advisor: Dr. Pengtao Xie University of California San Diego
- Participated in the creation of the largest medical dialogue dataset to date.
- Pre-trained several dialogue generation models on the Chinese MedDialog dataset and studied the transferability of models trained on MedDialog to low-resource medical dialogue generation tasks.
- Cited by 58 research articles.

Collision Avoidance Racecar under Complex Environments. [More Details] 2019
Research Assistant, Advisor: Dr. Zheng Fang Northeastern University (China)
- Studied a robotic system that is high-speed and auto-obstacle-avoidance under complex environment.
- Adopted maximum gap to implement reactive motion planning, and used behavioral cloning for short-term planning in some specific scenarios (e.g., U-turn corners).
- The robot speed reached nearly 4.0 m/s under the complex environment and won 1st Prize in the NXP Cup National University Students Intelligent Car Race.

Industry Experience

Water-Mirror, *Robotic Algorithm Engineer Intern* Sep 2020 - Nov 2020
- Deploy anytime and bounded CBS algorithm to intelligent warehouse management, which requires up to 100 robots path planning.
- The proposed algorithm has 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 two language versions: Python and C++. Exposed an API to 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

- 1st Prize, The NXP Cup National University Students Intelligent Car Race, 2019
- Second-Class Scholarship, Northeastern University (Top 5%), 2018 & 2019