Tong Xu

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EDUCATION

George Mason University — Fairfax, VA
Ph.D. in Computer Science — *Aug. 2023 - Present*

- GPA: 3.92/4.0
- Research Focus: Reinforcement Learning for Field and Legged Robotics

University of Southern California — Los Angeles, CA
M.S. in Computer Science — *Aug. 2021 - May 2023*

Nanjing University of Information Science & Technology — Nanjing, China
B.E. in Network Engineering — *Sept. 2017 - June 2021*

RESEARCH EXPERIENCE

RobotiXX Lab, George Mason University — Fairfax, VA
Advisor: *Professor Xuesu Xiao* — *Aug. 2023 – Present*
Project: Automatic Curriculum Learning (ACL) for Verti-Wheelers

- Created the *VW-Chrono* simulator and designed for wheeled mobility on vertically challenging terrain to algorithmically generate varied vertically challenging terrain for ACL
- Proposed *Verti-Selector*, a novel ACL framework that samples training terrain based on estimates of future learning potential (TD-error)
- Significantly enhanced navigation performance by 23.08% improvement in terms of success rate compared against a manually designed curriculum, vanilla Reinforcement Learning, and two baseline approaches
- Authored a research paper and submitted to IEEE International Conference on Robotics and Automation (ICRA) 2025

Human-to-Everything Lab, Boston University — Boston, MA
Advisor: *Professor Eshed Ohn-Bar* — *May 2022 - Aug. 2022*
Project: DeepVO - Visual Odometry with Deep Learning

- Utilized rotation matrix and geometric equation to acquire the absolute and relative poses of various images
- Reproduced *DeepVO* network architectures by integrating *FlowNetSimple* pretrained model with LSTM
- Improved the influence of epochs by 14.8% and hyperparameter k by 8.4% in the loss function of *DeepVO* network, using KITTI and nuScenes datasets, based on translation and rotation RMSE values
- Plotted trajectories on the predicted results from test sequences and compared them with original routes

Duke University — Durham, NC
Advisor: *Professor Rabih Younes* — *June 2022 - Aug. 2022*
Project: Cone Detection by Faster R-CNN

- Utilized *Albumentations* API to augment cone annotated dataset
- Reproduced Faster R-CNN model by integrating Region Proposal Network module with Fast R-CNN
- Optimized model by cross-entropy for classification and piecewise function for bounding box regression
- Improved the performance of Faster R-CNN model by 37.4% in terms of recall rate compared with YOLOv3 model on cone annotated dataset

PUBLICATIONS

Conference

[C4] **T. Xu**, C. Pan, X. Xiao. "Verti-Selector: Automatic Curriculum Learning for Wheeled Mobility on Vertically Challenging Terrain," *in arXiv preprint arXiv:2409.17469,* 2024 (Video)

[C3] X. Cai, J. Queeney, **T. Xu**, et al. "Pietra: Physics-informed evidential learning for traversing out-of-

distribution terrain," *in arXiv preprint arXiv:2409.03005,* 2024 (Video)

[C2] **T. Xu**, C. Pan, X. Xiao. "Reinforcement learning for wheeled mobility on vertically challenging terrain," *in arXiv preprint arXiv:2409.02383,* 2024

[C1] **T. Xu**, "Single-view and multi-view methods in marker-less 3d human motion capture," in *Journal of physics: conference series,* 2019, pp. 012022

Journal

[J1] X. Zhang, **T. Xu**, et al. "Multiple source domain adaptation in micro-expression recognition," in *Journal of Ambient Intelligence and Humanized Computing,* vol. 12, no. 8, pp. 8371–8386, 2021.

TEACHING EXPERIENCE

Graduate Teaching Assistant — George Mason University
CS 262: Introduction to Low-Level Programming — *Jan. 2024 - Present*
CS 112: Introduction to Computer Programming — *Aug. 2023 - Dec. 2023*

- Designed student lab contents involving data structure and leaded the whole lab recitation
- Created grading scripts and managed a team of 6 undergraduate teaching assistants

WORK EXPERIENCE

Assistant of International Academic Interaction — Nanjing, China
Nanjing University of Information Science & Technology — *Oct. 2019 - May 2020*

- Assisted the supervisor to edit periodicals, process daily issues and emergencies, complete manuscript, review, and perform other corresponding responsibilities
- Performed record-keeping and feedback handling of international academic affairs in department

PROFESSIONAL SERVICE

Peer Reviewer

- IEEE International Conference on Robotics and Automation (ICRA)
- IEEE International Conference on Safety, Security, and Rescue Robotics (SSRR)

TECHNICAL SKILLS

Programming Languages:	Python, C++, C, C#, Java, SQL, JavaScript
AI Frameworks:	Pytorch, TensorFlow, Keras
Cloud Computing:	AWS, Google Cloud Platform, Hopper
Robotics:	ROS, Chrono, NVIDIA IsaacGym, OpenAI Gymnasium
Version Control:	Git, Markdown