Tianyi Gu

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https://gtianyi.github.io/

Research Interests Heuristic search, motion planning, robotics, multi-agent planning, metareasoning.

Education

University of New Hampshire — Ph.D. in Computer Science, 2021
Dissertation: *Metareasoning for Heuristic Search Using Uncertainty.* Advisor: Prof. Wheeler Ruml.

Shanghai Maritime University — M.E. in Logistics Engineering, 2012
Thesis: *Planning for Yard Systems in Container Terminals using Genetic Mechanism-based Approach.* Advisor: Prof. Chengji Liang.

Shanghai Maritime University — B.E. in Logistics Engineering, 2010
Thesis: *SAIC Global Powertrain Development Process Lean Analysis.* Advisor: Prof. Ziqi Xu.

Professional Experience

Symbotic
Senior Software Engineer — September 2024–Current
- Member of the routing team that designs, develops and qualifies software solutions for robotic warehouse automation.
- Contribute to the development of software for scheduling and managing fleets of robots, troubleshoot production and design issues, and develop cognitive technologies to optimize software performance and minimize maintenance.

Motional
Senior Software Engineer — January 2023–July 2024
- Member of the motion planning and autonomy integration team that works on AV driverless launch and new city deployment.
- Build an ODD-aware routing system to support driverless launch and commercial launch.
- Build the Route Engine that generates a Geonet for AV fleet public road testing and data collection.

Motion Planning Research Intern — May 2020-August 2020
- Propose and develop a learning-based approach to enhance the trajectory generator. The feature was integrated into the next-generation planner for autonomous vehicles.

Argo AI
Software Engineer II — February 2022–December 2022
- Member of the motion planning team that designs, builds, tests, and deploys a safety–critical trajectory generator for autonomous vehicles.
- Develop an ML-based and rule-based hybrid approach for high-level behavior action scoring.

University of New Hampshire
Graduate Research Assistant — September 2020–December 2021
- Build the theoretical foundation for online planning. Seek answers for how to plan in an uncertain environment under time pressure.

Graduate Teaching Assistant September 2015–May 2020

- Involved in creating assignments, exams and conducting recitation sessions for Algorithms (C), Intro to AI, Intro to Computer Science (Java, Python), Intro to Software Engineering, Intro to Computer Security, Database Programming (C#), Scripting Languages (Shell).

Cognitive Assistive Robotics Lab

Robotics Intern May 2019-August 2019

- Build a smart home based service robot framework that can provide real-time Alzheimer's disease care.
- Build a AI planner based on ROSPlan that performs real-time online task planning.

Realtime Robotics

Robotics Intern May 2018-August 2018

- Build a real-time planner for an autonomous vehicle that is able to safely drive in a crowded urban area. Successfully handed off to daily usage.
- Build a real-time planning framework that enabled handling a dynamic world online.
- Build a simulation environment to demostrate flagship product to major new customers.

Shanghai International Port Group

Research Software Development Engineer July 2012-August 2015

- Member of the team that design, build, and deploy a new automated container terminal operations management system, including algorithm development for the crane allocation and scheduling module.
- Help launch previous terminal operating management system.

Refereed Archival Publications

Maximilian Fickert, Tianyi Gu, and Wheeler Ruml, "New Results in Bounded-Suboptimal Search." *Proceedings of the Thirty-sixth AAAI Conference on Artificial Intelligence (AAAI-22)*, 2022.

Tianyi Gu, Wheeler Ruml, Shahaf Shperberg, Eyal Shlomo Shimony, and Erez Karpas, "When to Commit to an Action in Online Planning and Search." *Proceedings of the Symposium on Combinatorial Search (SoCS-22)*, 2022.

Sajay Arthanat, Momotaz Begum, Tianyi Gu, Dain P. LaRoche, Dongpeng Xu, and Naiqian Zhang, "Caregiver Perspectives on A Smart Home-based Socially Assistive Robot for Individuals with Alzheimer's Disease and Related Dementia." *Disability and Rehabilitation: Assistive Technology*, 15(7), pp. 789-798, 2020.

Scott Kiesel, Tianyi Gu, Wheeler Ruml, "An Effort Bias for Sampling-based Motion Planning," *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, 2017.

Skills

Programming Languages: C++, Python, C#.
Dev tools: Linux, Git, Vim, tmux.

Citizenship

China.
U.S.A visa: H1-b.