

JUN WANG

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BIOGRAPHY

I am a third-year PhD candidate at the Department of Electrical and Systems Engineering, Washington University in St. Louis, advised by Prof. Yiannis Kantaros. My research goal is to design algorithms for safe robot autonomy. My research topics are related to formal methods, machine learning, and robust control. My recent work focuses on large language models and formal methods-based control.

Research Interests: Robotics, Machine Learning, Planning and Control

EDUCATION

Washington University in St. Louis , St. Louis, MO, USA Ph.D. Candidate in Electrical Engineering Advisor: Prof. Yiannis Kantaros	Jan 2022 - Present GPA: 4.0/4.0
University of Pennsylvania , Philadelphia, PA, USA M.S.E. in Robotics Advisor: Prof. George Pappas & Prof. Hamed Hassani Thesis: "Model-Based Robust Semantic Segmentation"	Aug 2019 - May 2021 GPA: 3.97/4.0
Sun Yat-Sen University , Guangzhou, China B.Eng. in Software Engineering	Aug 2015 - May 2019 GPA: 3.8/4.0
Sungkyunkwan University , Seoul, Korea Computer Engineering (Exchange Program)	Jan 2018 - Jul 2018 GPA: 3.8/4.0

WORK EXPERIENCE

Schlumberger Doll Research Center , Cambridge, MA, USA Research Intern (Robotics & Sensor Physics Department) Worked with Dr. Tianxiang Su on deep learning based wireline cable spooling automation algorithms.	May 2021 - Jan 2022
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PUBLICATIONS

Pre-print:

- [a 4.] **J. Wang**, G. He, and Y. Kantaros, "Safe Task Planning for Language-Instructed Multi-Robot Systems using Conformal Prediction" **Preprint** arXiv:2402.15368
- [a 3.] **J. Wang**, H. Hasanbeig, K. Tan, Z. Sun, and Y. Kantaros, "Mission-driven Exploration for Accelerated Deep Reinforcement Learning with Temporal Logic Task Specifications." **Preprint** arXiv:2311.17059
- [a 2.] **J. Wang**, H. Chen, Z. Sun, and Y. Kantaros, "Verified Compositional Neuro-Symbolic Control for Stochastic Systems with Temporal Logic Tasks." **Preprint** arXiv:2311.10863
- [a 1.] **J. Wang**, J. Tong, K. Tan, Y. Vorobeychik, and Y. Kantaros, "Conformal Temporal Logic Planning using Large Language Models: Knowing When to Do What and When to Ask for Help." **Preprint** arXiv:2309.10092

Conference:

- [c 3.] R. Mitta, H. Hasanbeig, **J. Wang**, D. Kroening, Y. Kantaros, and A. Abate, "Safeguarded Progress in Reinforcement Learning: Safe Bayesian Exploration for Control Policy Synthesis." the Conference on Artificial Intelligence (**AAAI 2024**).
- [c 2.] K. Tan, **J. Wang**, and Y. Kantaros, "Targeted Adversarial Attacks against Neural Network Trajectory Predictors." Proceedings of The 5th Annual Learning for Dynamics and Control Conference, PMLR 211:431-444, 2023 (**L4DC**).

[c 1.] **J. Wang**, S. Kalluraya, and Y. Kantaros, “Verified compositions of neural network controllers for temporal logic control objectives.” IEEE 61st Conference on Decision and Control (CDC), 4004-4009, 2022.

RESEARCH EXPERIENCE

• Formal Methods-based Control (WashU)

- Proposed a sample-efficient deep Reinforcement Learning (RL) algorithm for Linear Temporal Logic (LTL) encoded tasks.
- Proposed a new approach to design verified compositions of Neural Network (NN) controllers for autonomous systems with tasks captured by LTL formulas[2].

• Model-based Robust Semantic Segmentation (UPenn GRASP)

- Proposed a model-based robust training algorithm with the help of domain adaptation methods to improve the robustness of 2D semantic segmentation under natural variations

AWARDS

Scholarship for Academic Excellence, Sun Yat-Sen University, Guangzhou, China. 2016-2017.

TECHNICAL SKILLS

Programming Languages Python, Matlab, C/C++

Deep Learning Frameworks Pytorch, Tensorflow

Robotics Platform ROS, Gazebo

PROFESSIONAL SERVICES

Conference Reviewer:

- Annual Learning for Dynamics & Control Conference(L4DC)
- IEEE/RSJ International Conference on Intelligent Robots and Systems(IROS)
- International Conference on Robotics and Automation(ICRA)
- International Conference on Autonomous Agents and Multiagent Systems (AAMAS)

TEACHING SERVICE

As Teaching Assistant:

- ESE 559: Special Topics in Systems and Control: Learning and Planning in Robotics, Wash U. 2024 Spring
- CIS 519: Applied Machine Learning, UPenn. 2021 Spring

As Graduate Course Grader:

- ESE 547: Legged Locomotion, UPenn. 2021 Spring
- ESE 512: Dynamical Systems, UPenn. 2020 Fall
- ESE 500: Linear Systems, UPenn. 2020 Fall

SUPERVISED STUDENTS

Past Students at Wash U.(Co-advised with Prof. Kantaros):

- Kaiyuan Tan(M.S. ESE, 2023), *Now Ph.D. student at Vanderbilt U.*
- Tianyou Hu(M.S. ME, 2023), *Now at Tesla*
- Zihe Sun(M.S. ME, 2022), *Now at Atosa USA*
- Haojun Chen(M.S. ME, 2022) *Now at Wabtec Corp.*