TIANCHEN JI

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EDUCATION

University of Illinois at Urbana-Champaign **Aug. 2019 – May 2024**
Ph.D. in Electrical and Computer Engineering

Xi'an Jiaotong University **Aug. 2015 – Jun. 2019**
Bachelor of Science in Electrical Engineering, GPA: 92.7/100

University of California, Berkeley **Aug. 2017 – May 2018**
Exchange Student, GPA: 3.95/4.0

Coursework: Machine Learning, Pattern Recognition, Computer Vision, Learning-based Robotics, MDPs and Reinforcement Learning, Control System Theory and Design, Introduction to Optimization, Random Process

TECHNICAL SKILLS

Programming Languages: Python, C++, MATLAB, HTML, CSS
Software&Tools: Pytorch, Git, Robot Operating System (ROS), Gazebo, WordPress, LaTeX, Office Suite

PROFESSIONAL EXPERIENCE

Human Centered Autonomy Lab, Urbana, IL **Aug. 2019 – Present**
Research Assistant

Learning-based Anomaly Detection for Robot Navigation
- Proposed a novel deep multi-class classifier, termed Supervised Variational Autoencoder (SVAE), which combines generative and discriminative models for better classification performance.
- Developed a visual safety monitoring system for field robot navigation with deep camera-lidar fusion.

Online Monitoring for Safe Pedestrian-Vehicle Interactions
- Designed and implemented a real time monitoring system that provides safety guarantees for an autonomous vehicle driving among pedestrians.
- Deployed the system on a Polaris Gem electric vehicle in both Gazebo simulation and real world.

Robust MPC with Recursive State Estimation
- Proposed a robust model predictive controller (MPC) with a recursive state estimation scheme for constrained optimal control of uncertain systems.
- Demonstrated the robustness of the controller against disturbances through numerical examples.

AUTOWISE, Shanghai, China **May. 2019 – Aug. 2019**
Software Engineering Intern
- Increased the run-time efficiency of the autonomous vehicle planning and control module by 400% by exploiting the invariant structure of the online optimization problem.
- Tested and deployed the improved module in the new distribution of autonomous driving software.

PUBLICATIONS

CONFERENCE

1. **[CoRL'20]** Tianchen Ji, Sri Theja Vuppala, Girish Chowdhary, and Katherine Driggs-Campbell, "Multi-Modal Anomaly Detection for Unstructured and Uncertain Environments", *Conference on Robot Learning*, 2020. [pdf]
2. **[ITSC'20]** Peter Du, Zhe Huang*, Tianqi Liu*, Tianchen Ji*, Ke Xu*, Qichao Gao*, Hussein Sibai, Katherine Driggs-Campbell, and Sayan Mitra, "Online Monitoring for Safe Pedestrian-Vehicle Interactions", *IEEE International Conference on Intelligent Transportation Systems*, 2020. [pdf]

PREPRINT

3. Tianchen Ji and Katherine Driggs-Campbell, "Robust Model Predictive Control with Recursive State Estimation under Set-Membership Uncertainty", *arXiv preprint arXiv:2008.04980*, 2020. [pdf]

LEADERSHIP & ACTIVITIES

- **Web and Media Chair** (Jun. 2020 – Feb. 2021): In 16th CSL Student Conference at UIUC [website]
- **Journal and Conference Reviewer**: T-NNLS'21, ITSC'21, ITSC'20, ICRA'20, CDC'20