

EDUCATION

Imperial College London*May 2021-Now***Status:** Ph.D. Candidate.**Research Interests:** Trustworthy Machine Learning, Interpretability, Robot Learning, Aerial Robotics.**Shanghai Jiao Tong University (with honor)***September 2017-March 2020***Degree:** Master of Engineering**Major:** Information and Control**Comprehensive Ranking:** 1/71**Core Courses:** Numerical Estimation, Optimal Estimation and Information fusion, Optimal Control Principle and Application, Matrix Theory.**Research Interests:** Safe Reinforcement Learning, Muti-Sensor Fusion.**Southeast University (with honor)***September 2013-June 2017***Degree:** Bachelor of Engineering

Overall GPA: 3.84/5.0

Major: Automation, School of Automation**Comprehensive Ranking:** 3/144**Core Courses (Full score is 100 points):** Probability Theory and Mathematical Statistics (94), Electronic Circuit Foundation (95), Computer Composition and Structure (92), Communication Principle (97).**Research Interests:** Automatic Control, Machine Learning.

RESEARCH EXPERIENCES

- **Reliable Trajectory Planning and Tracking Framework on Trustworthy Autonomous Navigation**
Source: National Science Foundation (NSF) – United Kingdom *January 2021-Now*
A trustworthy systematic framework was developed for real quadrotor autonomous navigation for dynamic environments. Encountering aerodynamic effects such as strong winds, the proposed framework demonstrates safe, efficient and accurate trajectory generation and tracking, respectively. The work guarantees safety and robustness of the framework via formal verification and practical engineering.
- **Perception-to-decision Reinforced Imitation: An Intelligent Flight Control System**
Source: Shanghai Industrial Strengthening Project *January 2017-December 2020*
An Intelligent Flight Control System (IFCS) was built for autopilot. The underlying IFCS combines a imitation learning and reinforcement learning. The developed approach was proved to be more efficient and robust for the complicated flight situation than the existing autopilot system.
- **A Robot Self-Localization System Based on Computer Vision**
Source: Robot World Cup (RoboCup) *October 2014-October 2016*
Robocup is a professional robot competition with a large influence, a high level of comprehensive technology and a wide range participation across the world. A vision-based self-localization system was developed using computer vision. We are the last eight teams of RoboCup 2016, in Leipzig, Germany.

PUBLICATIONS

See my personal website (<https://alex-yanranwang.github.io/>) and Google Scholar for details please.

1. **Yanran Wang**, Qiuchen Qian, and David Boyle. "Probabilistic Constrained Reinforcement Learning with Formal Interpretability." International Conference on Machine Learning (ICML), 2024.

2. **Yanran Wang**, and David Boyle. "Constrained Reinforcement Learning using Distributional Representation for Trustworthy Quadrotor UAV Tracking Control." IEEE Transactions on Automation Science and Engineering, 2024. (Conditionally Accepted)
3. Qiuchen Qian, **Yanran Wang**, and David Boyle. "On solving close enough orienteering problems with overlapped neighborhoods." European Journal of Operational Research, 2024.
4. **Yanran Wang**, James O’Keeffe, Qiuchen Qian, and David Boyle. "QuaDUE-CCM: Interpretable Distributional Reinforcement Learning using Uncertain Contraction Metrics for Precise Quadrotor Trajectory Tracking." 6th Annual Conference on Robot Learning (CoRL). PMLR, 2023.
5. **Yanran Wang**, James O’Keeffe, Qiuchen Qian, and David Boyle. "Interpretable stochastic model predictive control using distributional reinforced estimation for quadrotor tracking systems." In 2022 IEEE 61st Conference on Decision and Control (CDC), pp. 3335-3342. IEEE, 2022.
6. **Yanran Wang**, James O’Keeffe, Qiuchen Qian, and David Boyle. "KinoJGM: A framework for efficient and accurate quadrotor trajectory generation and tracking in dynamic environments." In 2022 International Conference on Robotics and Automation (ICRA), pp. 11036-11043. IEEE, 2022.

HONOURS AND AWARDS

- Outstanding graduate honor in Shanghai City 2020
Awarded for my master study in Shanghai Jiao Tong University (ranking 2/71).
- National Scholarship 2018
Awarded for my master study in Shanghai Jiao Tong University (ranking 1/71).
- Graduate First-class Academic Scholarship 2017
Awarded for the course grade of my first-year master study in Shanghai Jiao Tong University.
- Exam-exempted postgraduate student 2017
Recommended by my undergraduate institution - i.e., Southeast University (ranking 3/144) - to pursue a master degree at Shanghai Jiao Tong University.
- The first prize of Mathematical Contest in Modeling (MCM) 2015
Awarded for theoretical model design and programming implementation. MCM is the largest basic mathematical competition for Chinese undergraduate students.
- President Scholarship 2015
Awarded for my undergraduate study in Southeast University.

INTERNSHIP

- **Internship in Ant Financial Services Group (Alipay)** *May 2019-May 2020*
Machine Learning Algorithm Intern
A Deep Neural Network and Deep Reinforcement Learning model was built for a recommender system which is used to estimate Internet user’s Click-Through-Rate.
- **Intel Asia Pacific R&D Center** *March 2019-May 2019*
Deep Learning Software Intern
Responsible for machine learning framework (BigDL) development and test preprocessing.