

# Siyuan Wu

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## EDUCATION

**MSc Robotics, [Delft University of Technology](#), Delft, Netherlands** *Sep. 2021 - Aug. 2023 (Est.)*

Supervised by Dr. Javier Alonso-Mora.

Robot Software Practical (9.5), Planning & Decision Making (9.5), Optimisation for System & Control (9.0), Robot Dynamics & Control (9.0), Machine Learning for Robotics (9.0), Machine Perception (9.0), OOP C++ (9.5), etc.

**Visiting student, [FAST Lab](#), [Zhejiang University](#), Huzhou, China** *Jul. 2020 - Aug. 2021*

Supervised by Dr. Fei Gao.

Finished my Bachelor thesis: Object tracking and collision avoidance with event camera.

**B. Eng. in Automation (with Honors), [Xi'an Jiaotong University](#), Xi'an, China** *Sep. 2017 - Jul. 2021*

**Honors Engineering Program**, Qian Xuesen Class GPA: 3.98/4.3

Linear Algebra(90), Calculus(92), Statistics(98), Complex analysis (100), Operations research(96), etc.

**Exchange, [University of Edinburgh](#), Scotland, United Kingdom** *Jan. 2020 - Jul. 2020*

Undergraduate Exchange Program courses: Reinforcement Learning, Game Theory, Optimal Control, etc.

## SKILLS

**Programming:** C/C++, Python, MATLAB, Verilog

**Softwares&Tools:** ROS, Gazebo, PX4, OpenCV, PyTorch, Tensorflow

**Theoretical Knowledge:** Motion Planning, Optimization, Optimal Control

## RESEARCH INTERESTS

Autonomous Navigation, Motion Planning, Unmanned Aerial Vehicles, Optimal Control, MPC

## MASTER THESIS

**Topic:** Distributed Multi-Agent Motion Planning in Dynamic Environments

**Main supervisor:** Dr. Javier Alonso-Mora, **Daily supervisor:** Dr. Gang Chen (Post-Doc)

**Est. completion date:** July 2023

## PUBLICATIONS

**Siyuan Wu**, Gang Chen, Moji Shi, Javier Alonso-Mora "Multi-Agent Trajectory Planning in Dynamic Environments with Occupancy Prediction", *submitted to IROS 2023* [[code](#)]

Gang Chen, **Siyuan Wu**, Moji Shi, Wei Dong, Hai Zhu, Javier Alonso-Mora "RAST: Risk-Aware Spatio-Temporal Safety Corridors for MAV Navigation in Dynamic Uncertain Environments", *IEEE Robotics and Automation Letters (RA-L)*, 2023 [[paper](#), [code](#)]

Botao He\*, Haojia Li\*, **Siyuan Wu**, Dong Wang, Zhiwei Zhang, Qianli Dong, Chao Xu, Fei Gao "FAST-Dynamic-Vision: Detection and Tracking Dynamic Objects with Event and Depth Sensing", *IEEE/RSJ International Conference on Intelligent Robots and Systems(IROS)*, 2021 [[paper](#), [code](#), [video](#)]

## SELECTED PROJECTS

**MAV Autonomous Navigation in Dynamic Environments**

*Dec. 2021 - Present*

**Supervised by** [Dr. Javier Alonso-Mora](#), Cognitive Robotics, TU Delft

- Developed a multi-robot trajectory planning framework in ROS for safe navigation in dynamic environments.
- Utilized an efficient method to construct spatio-temporal safety corridors from a particle-based uncertainty map, which achieves the highest success rate compared to state-of-the-art algorithms under different noise levels.
- Implemented a minimum jerk trajectory optimizer based on Bernstein polynomials in C++ by solving quadratic programming (QP) problems.

## A Paper Reproduction of Learning Monocular Dense Depth from Events

April. 2022 - June. 2022

course project: Seminar Computer Vision by Deep Learning [blog]

- Reproduced the paper "Learning Monocular Dense Depth from Events" and trained on a DSEC dataset.
- Discussed the results with different losses, e.g. structural similarity (SSIM) loss.

## Perception with Dynamic Vision Sensors

Jul. 2020 - Feb. 2021

Supervised by [Dr. Fei Gao](#), FAST Lab, Zhejiang University

- Hardware design and assembly of a 450mm drone carrying DVXplorer, Realsense 435i and DJI Manifold-2C.
- Proposed an onboard perception system for dodging fast-moving objects with low latency and high precision.
- Implemented a moving object detection and trajectory prediction algorithm on an onboard event camera.

More projects can be found at <https://edmundwsy.github.io/projects/>

## AWARDS AND SCHOLARSHIPS

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National Scholarship of China	Top 1%	Ministry of Education, China	Nov. 2018
Second Standard Scholarship	Top 5%	Xi'an Jiaotong University	Sep. 2019, Sep.2020
Mechanic Alumni Scholarship	Top 3%	Qian Xuesen's Honors College, XJTU	Mar. 2019
Excellent Graduate		Xi'an Jiaotong University	Jul. 2021

## ACTIVITIES

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IEEE RAS Winter School on SLAM in Deformable Environments, 2020 (Won [3rd Prize](#) over 19 Groups)[code]

Teaching Assistant of TU Delft MSc courses: RO47003 Robot Software Practical

Teaching Assistant of TU Delft MSc courses: RO47005 Planning & Decision Making