

MOJI SHI

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<https://smoggy-p.github.io/>

EDUCATION

<u>Shanghai Jiao Tong University, China</u>	2016.09-2020.06
Bachelor in Mechanical Engineering	86.2/100
<u>Karlsruhe Institute for Technology, Germany</u>	2019.03-2019.08
Bachelor in Mechanical Engineering	
<u>Technical University of Delft, Netherland</u>	2021.09-now
Master in Robotics	8.7/10

RESEARCH EXPERIENCE

<u>Shanghai Institute of Ceramics, Chinese Academy of Science</u>	2020.07-2021.08
<ul style="list-style-type: none">Research assistant using Finite Element Analysis to simulate the fluid movement within a radiator and to design the thermoelectrical device	
<u>Risk-aware spatiotemporal (RAST) safety corridors</u>	
<ul style="list-style-type: none">In this paper, we present a method for MAV navigation in dynamic uncertain environment. My main contribution in this work is implementing the trajectory optimization with minimum snap algorithm given the spatiotemporal safety corridors to achieve a smooth trajectory within the corridors.The paper is accepted for RA-L.	
	2021.12-2022.06

PROJECT

Spherical omnidirectional robot design

- I work with a group to design a spherical omnidirectional robot and is responsible for designing the dynamic control system. I equipped the robot with self-balance control strategy and simultaneous localization and mapping functions.
- Second Prize in presentation (Top 3 design out of over 60 groups)

k-PRM* UAV planner with corridor-based trajectory optimization

- We implemented k-PRM for front-end path searching and an iterative method for back-end corridor-based trajectory optimization. My main contribution is implementing adjacent-list graph, A* graph search algorithm and adding some constraints for trajectory optimization.
- We achieved grade 9.5/10 for this course project, one of the top groups.

Model predictive control for UAV collision avoidance

- In this project we designed a model predictive controller for UAV so that it can avoid obstacles. Specifically, we designed terminal cost and terminal set for cost function, added observer to predict unknown disturbance and strictly prove the asymptotic stability of the system.
- We achieved grade 9.5/10 for this course project, one of the top groups.

Dynamic programming for peak shaving problem

- In this project we designed a stochastic controller to solve peak shaving problem with dynamic programming. Specifically, we discretize the state space and action space and model the system into a Markov chain. Then we solve the dynamic programming given a time horizon to minimize the cost.
- We achieved grade 9.5/10 for this course project, one of the top groups.

PERSONAL EXPERIENCE

Teaching assistant for “Hello World with ROS” on edX

2021.12-now

- Maintain the discussion forum and keep track of all course materials
- Over 2000 people from all over the world are taking our course

Teaching assistant for RO47005 Machine Perception

2022.11-2023.01

- Attending Q&A sessions to answer questions and grading for assignments
- Skills in machine vision, object detection, depth estimation, coding with python

LANGUAGE

- English: TOFEL 101(best score)
- English: GRE 322+3.5 (Verbal:154 Quantitative: 168)
- German: DSH 2.0(Deutsche Sprachprüfung für den Hochschulzugang ausländischer Studienbewerber)

TECHNICAL STRENGTHS

- CAD: Solidworks, UG-NX
- CAE: ANSYS, Fluent
- Programming: C++ (with OpenGL, OpenCV), Python(pytorch), ROS, MATLAB