

## EDUCATION

- **Beihang University** Sept. 2021 - Jun. 2024 (expected)  
*M. Sc. in Control Science and Engineering, GPA: 89.2/100* Advisor: *Prof. Xiwang Dong*
- **Technical University of Denmark** Aug. 2019 - Sept. 2019  
*Visiting student at the summer school* *Department of Applied Mathematics and Computer Science*
- **Beihang University** Sept. 2017 - Jun. 2021  
*B. Eng. of Automation (outstanding graduate award), GPA: 88.5/100*

## RESEARCH INTERESTS

I am passionate about exploring optimization and machine learning, from the foundational principles and algorithmic design to their practical applications in robotics and autonomous systems.

## PUBLICATIONS

1. Yicheng Chen, Jinjie Li, Wenyuan Qin, Yongzhao Hua, Xiwang Dong, Qingdong Li, “[Learning-Initialized Trajectory Planning in Unknown Environments](#)”, *arXiv:2309.10683*, 2023. [Submitted to ICRA’24] [[video](#)]  
**[Featured]** We introduce the Learning-Initialized Trajectory Planner (LIT-Planner), a novel approach that guides optimization using a neural network to provide initial values. Our method enjoys both time-efficiency and explainability.
2. Yicheng Chen, Lingling Wang, “[Adaptively Dynamic RRT\\*-Connect: Path Planning for UAVs Against Dynamic Obstacles](#)”, *2022 7th International Conference on Automation, Control and Robotics Engineering (CACRE)*, 2022. [[slides](#)]
3. Huan Chang\*, Yicheng Chen\*, Baochang Zhang, David Doermann. “[Multi-UAV Mobile Edge Computing and Path Planning Platform Based on Reinforcement Learning](#)”. *IEEE Transactions on Emerging Topics in Computational Intelligence*, 2021. (\* equal contribution)

## MASTER’S THESIS

- **Cooperative Online Trajectory Planning for Autonomous Aerial Robotics Swarm** Nov. 2022 - Present  
*Master’s Thesis | Expected completion time: May 2024* Advisor: *Prof. Xiwang Dong*
  - **Scope:** (1) Autonomy: Onboard perception, planning, and control. (2) Online: Real-time computing. (3) Cooperation: Multiple drones to perform cooperative tasks, such as search and rescue.
  - **Roadmap:** (1) By Sept. 2023, achieve reliable autonomous flight of a single drone in unknown environments. (2) By May 2024, achieve cooperative flight of a swarm of drones for some specific tasks.
  - **Progress:** Accomplished the first waypoint in Sept. 2023 with the paper “Learning-Initialized Trajectory Planning in Unknown Environments”.

## PROJECTS

- **Aeriva: A Mini Autonomous Quadrotor Platform** Mar. 2023 - Aug. 2023  
*Individual work*
  - **Accomplishments:** Designed and assembled a mini autonomous quadrotor platform ‘Aeriva’ from scratch. Configured up-to-date hardware and solved a series of engineering problems across the perception, planning, and control stack.
  - **Features:** (1) Agile and safe: Aeriva is built upon a 3.5-inch cinewhoop frame with Kakute H7 mini flight controller, with a thrust-to-weight ratio of 4.0, making it exceptionally agile, compact and safe. (2) High computing performance: Aeriva is equipped with NVIDIA Jetson Orin NX, facilitating it with strong onboard computing capabilities.
  - **Highlights:** This platform has supported my featured publication and the championship in the 2023 Huashan UAV challenge.
- **2023 Huashan UAV Challenge - Champion** May 2023 - Jun. 2023  
*Team work | Leader of a six-person team* *Ranker the first place in this national-level competition*
  - **Challenge:** This competition requires two autonomous drones to bypass a threat area in the field and reach a target point simultaneously. All positions are provided by UWB.
  - **Solutions:** Developed a cooperative trajectory planning and tracking algorithm for dual drones. Contributed to the system architecture of the drones, including the hardware and software. Provided a framework to achieve UWB positioning, communication between the drones and the ground station, trajectory planning, and tracking control based on ROS and PX4.
  - **Highlights:** Ranked first place in this competition. The achievements were presented in the 2023 Beihang Technology Exhibition.

- SLAM Practice on Unmanned Ground Vehicles** Oct. 2021 - Dec. 2021 & Mar. 2022 - May 2022
  - Individual work
    - Accomplishments:** (1) implemented G-mapping on a TurtleBot. (2) Implemented Gmapping and RTAB-Map on an Ackerman mini vehicle. Besides, implemented a motion planning algorithm based on Dijkstra with TEB planner to navigate it through obstacles.
- Modeling and Simulation for Quadcopter** Mar. 2022 - Apr. 2022
  - Individual work *Course project: The Modeling and Simulation For Quadcopter*
    - Accomplishments:** Modeled and simulated quadcopters in MATLAB and Simulink. Implemented functions including position control, path following, and formation flight.
- Application of Machine Learning in Medical Image Classification** Mar. 2020 - May 2020
  - Team work | *Leader of a three-person team* *Course project: Pattern Recognition*
    - Aim:** Use machine learning approaches to help preliminary diagnosis of chest radiographs: classify radiographs into 3 classes – COVID, normal, and viral pneumonia with the highest possible accuracy.
    - Solution:** Used transfer learning to train several models including ResNet, DenseNet, InceptionResNet, etc. on a labeled training set. Used stacking to ensemble these models to build a stronger model.
    - Highlights:** Achieved accuracy of more than 0.98. Especially, the model achieved almost 100% precision in the COVID class. Released the solution on Kaggle. This project got full marks in the course.
- 2018 Beihang Robot Competition - 4th Place** Oct. 2018 - Dec. 2018
  - Team work | *Responsible for mechanical design and assembly* *Ranked the 4th place in this college-level competition*
    - Challenge:** This competition requires participants to build a robot with the following functions: line tracking, obstacle avoidance, object grabbing, and Bluetooth remote control.
    - Solutions:** Built a multifunctional wheeled robot from scratch: Used Arduino as the computer. Incorporated infrared modules and ultrasonic modules for line tracking and obstacle avoidance in a reactive manner. Made a cylinder with a rubber band that can take objects in. Achieved remote control via the Bluetooth module and an Android Application.
    - Highlights:** Ranked the 4th place in the final. Got a lot of experience and more importantly, a great passion for robotics.

## SKILLS SUMMARY

---

- English:** GRE (Verbal 152, Quantitative 170, AW 3.5), TOEFL iBT 105 (Reading 30, Listening 27, Speaking 22, Writing 26)
- Programming:** Python, MATLAB, C/C++, LaTeX
- Software:** ROS, Gazebo, AirSim, PX4, PyTorch, TensorFlow, OpenCV, Simulink, SolidWorks, AutoCAD
- HardWare:** NVIDIA Jetson, Pixhawk, Motion Capture System, UWB
- Hobbies:** Long-Distance Running, Hiking, Cycling, Table Tennis, Snowboarding

## HONORS AND AWARDS

---

- Excellent Graduate Student Award (ten persons per year) from Beijing Association of Automation 2022
- Best Presenter Award from [CACRE](#) 2022 committee 2022
- Outstanding Graduate Award from Beihang University 2021
- Merit Student Award from Beihang University 2017, 2018, 2019