
# YOU YUFA MOTION PLANNING ENGINEER

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youyufa.github.io
my tech blog: motion-planning


## EDUCATION

**Harbin Institute of Technology** — Harbin, China
*M.E. in Control Engineering* — 2021 - 2023
- Advisor: Assoc. Prof. ZHAO Linhui
- Research area: Planning and Control of Autonomous Vehicle

**Dalian Maritime University** — Dalian, China
*B.E. in Automation* — 2017 - 2021
- GPA: 4.06/5.00, Rank: 5/127.

## WORK EXPERIENCE

**BYD Ltd. Autonomous Driving Unit** — Shanghai, China
*Senior Motion Planning Engineer* — 2023 - present

**Momenta Tech Ltd.** — Suzhou, China
*Planning Algorithm Intern* — 2022 - 2023

## PUBLICATIONS

1. Y. You, L. Zhao, H. Liu and Z. Liu, "A Hybrid Trajectory Planning Strategy for Intelligent Vehicles with Collision Avoidance," 2022 41st Chinese Control Conference (CCC), Hefei, China, 2022, pp. 5353-5358

## PROJECTS AT WORK

**4WD Parking System of BYD Yangwang U8/U7 and Denza Z9GT**
*BYD Ltd. Autonomous Driving Unit* — 2023.11 - present

- Develop path planner for 4WD vehicles(E4 Platform), which have ROTATION gear
- Develop framework of parking task, include preplan/env/decider/predict/etc.
- Make developing and testing tools with python/ros/ros2/gtest/QT/etc.
- Optimize prediction and nudging strategy for dynamic obstacles
- Design a multi-thread planning framework to fix functional safety risks

**Autonomous Valet Parking Research**
*BYD Ltd. Autonomous Driving Unit* — 2024.04 - present

- Design reference path optimizer algorithms with kinematic and collision constraints

**APA(Autonomous Parking Assistant) Project for BYD Seal and Denza N7**
*BYD Ltd. Autonomous Driving Unit* — 2023.07 - 2023.11

- Design path planner and decider for parallel/vertical/oblique slot
- Adapt parking system to different module

**Momenta HNP(Highway Navigation Pilot) Product**
*Momenta Tech Ltd.* — 2022.11 - 2023.03

- Implement CiLQR path optimizer
- Optimize crossroad and ramp processing

## Projects on campus

**Motion Planning with Milliken Dynamic Model**
*Master's Thesis Research in Harbin Institute of Technology* 2021.06 - 2023.06

- Describe vehicle dynamic constraints using MMM(Milliken Moment Method) and DPS(Depth-first Search)
- Design on-road and openspace planning method with dynamic constrains
- Implemented the above research with C++ on SOP(NVIDIA ORIN)

**Curling Robot for Winter Olympics Exhibition**
*Harbin Institute of Technology* 2021.09 - 2021.12

- Design game strategies based on curling rules and control curling robot with ROS

**Maritime Robot Research in AitLab**
*Dalian Maritime University* 2019.12 - 2020.7

- Design a 6 DOF shipborne stability platform and implement STM32 MCU control
- Design a ship-climbing rescue robot and implement C51 MCU control

**NXP Cup Intelligent Car Race 2019**
*Dalian Maritime University* 2018.09 - 2019.12

- Processing images and electromagnetic sensor information to achieve tracking, obstacle avoidance, crossing, and roundabout processing, with a speed of up to 3m/s
- Optimize entry and exit conditions of elements and control strategies to significantly improve code reliability

## Awards and Honors

- **Best Student Talent**, BYD Ltd. Autonomous Driving Unit 2023.12
- **The 1st Prize Scholarship**, Harbin Institute of technology 2022.05
- **Outstanding Talent**, Harbin Institute of technology 2022.05
- **The 2nd National Prize**, NXP Cup Intelligent Car Race 2019 2020.03
- **The 2nd National Prize**, CUMCM(Mathematical Modeling Contest) 2019.10
- **The 3rd National Prize**, CMC(Chinese Mathematical Competition) 2019.10
- **The 1st Prize Scholarship**, Dalian Maritime University 2019.04
- **The Innovation Scholarship**, Dalian Maritime University 2019.04

## Skills

**Languages**: Chinese, English(CET6 506).

**Programming**: C++, Python, MATLAB, Shell, Markdown, Latex, RegExp.

**Tool**: Git, Docker, ROS/ROS2, Linux, CMake, Protobuff, DDS, Bazel, GTest

**Planning**: Ceres, Eigen, OSQP, IPOPT, Hybrid A*, RRT, Lattice, iLQR, Apollo, Voronoi, MPC, PID, Spline. More details in: my tech blog: motion-planning

**Control**: LQR, PID, MPC, DWA