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Personal Statement

I hold a Master's degree in Autonomous Systems from Technical University of Denmark, having worked on C++ vehicle dynamics simulations, Matlab drone modelling & control and Deep RL controller. My experience includes engineering in FSAE and various robotics competitions, demonstrating strong technical and teamwork skills.

Education

Technical University of Denmark(DTU) **Copenhagen, Denmark**
Master of Science in Engineering (MScEng), ***Autonomous Systems*** *01.2021 – 12.2023*
GPA: 8.86/12; Courses: Linear control design, Perception for AS, Model-based system engineering

Chalmers University of Technology (exchange) **Gothenburg, Sweden**
MSc in ***System, Control and Mechatronics*** *09.2022 – 12.2023*
Courses: Vehicle Motion Engineering, Modelling and Simulation, MPC

Nanjing Insitition of Technology **Nanjing, Jiangsu**
BSc in ***Mechatronics*** *09.2016 – 06.2020*
GPA: 3.47, Rank in major: **10**/162

Internship & Work Experience

Hyperview - Apetech Autonomous Racing Car Project **ZZIC**
*Intern, Innovation and R&D Department (**keywords:** Matlab, Vehicle Control, Speed Planner)* *10.2024*
- Responsible for developing the simulation with heading and lateral controller.
- Developed a speed planner using track curvature calculated by Menger method.
- Implemented forward/backward adjustments to ensure the planned speed is consistent with the vehicle's acceleration and deceleration limits.
- Participated in tuning the vehicle control system, achieving a lap time of 2'40".

Chalmers Formula Student **Chalmers**
*Autonomous system engineer (**keywords:** C++, Gazebo, ROS, Vehicle dynamics modelling)* *09.2022 – 08.2023*
- Developed car state estimator using a LuGre tire model, implementing a 15-state Kalman filter.
- Developed a C++ plugin for **4wd vehicle dynamics simulation** using **RK4**.
- Solved conflict issues when migrated legacy simulator to latest Gazebo.
- Contributed to developing the launching system for launching autonomous systems with test options.
- Assisted the team in **winnning** the 2023 FSG Driverless Cup and securing 7th place at FS East.

Off-robot robot lab **NJIT, Nanjing**
*MCU developer & head of the lab (**keywords:** Embedded system, C, PID, Project Management)* *07.2017 – 07.2018*
- Developed lane-following car on STM32, featuring camera/laser rangefinder tracking and robotic arm control.
- Led the team to consecutive wins at provincial & national level robot competitions.
- Got two utility patents granted, and completed a Challenge Cup project in the topic of pipeline robots.

Projects

Reinforcement learning for robust mobile robot navigation control **DTU**
*Independent Developer (**keywords:** Kinematic modelling, Python, Reinforcement learning, PyQt)* *07.2023 – 12.2023*
- Developed the kinematic model for a two-wheel drive robot and a laser scanner module in Gymnasium.
- Developed an algorithm to generate randomized paths, obstacles, and corridor walls for the training environment.
- Implemented reward functions for path tracking and obstacle avoidance. Testing and parameters tuning.
- Created a GUI tool for easy tweaking of training and environment parameters and for visualizing simulations.
- Trained the NN controller with PPO, achieving a 60% success rate in unknown environments with obstacles.

Unmanned autonomous systems **DTU**
*Project Developer (**keywords:** Matlab, quadcopter modelling, trajectory planning)* *06.2022 – 06.2022*
- Created both nonlinear and linear models of the drone in Simulink for performance comparison.
- Developed position and altitude controllers in Simulink enabling set-point flight for quadcopter.
- Implemented path planning using A* in a 3D environment, successfully navigating a drone through a 3D maze.
- Utilized polynomial optimization for trajectory planning, making the quadcopter navigate through 3D hoops.

Awards

2023 Formula Student Germany Driverless Cup overall winner	**2023.08**
First Award in Intellect Vehicle Challenge	**06.2019**
Champion in 2018 China Engineering Robot Competition	**04.2018**
First Award in 2018 China Robot Competition	**08.2017**

Skills

Coding: Python, C/C++, Matlab/Simulink, Linux, ROS, Docker, git
Autonomous Systems Expertise: PID/LQR/MPC, Deep RL, modelling & control of drones, vehicles, and ROV
Language: IELTS 6.5 (Oral 7.0). Worked in international engineering team, demonstrating strong communication skills