

EDUCATION

09/2022 to present *Tu delft* Msc Mechanical Engineering: track biomechanical design

09/2018 to 07/2022 *Beihang University* Bsc Mechanical Engineering

✚ GPA: 3.64 / 4.00 (87.5/100)

✚ Honors: First Prize of Innovation and Entrepreneurship Scholarship

Relevant Coursework: Automatic Control 99/100, Environment Perception and Path Planning of Intelligent Robot 93/100, Computer Science 93/100, Intelligent Robotics 92/100

PROJECT EXPERIENCE

Research Intern Institute of Automation, Chinese Academy of Science (CASIA)

Supervisor: Hongbin Liu (King's college London & CASIA)

07/2021- 09/2022 **A Hybrid Force-Magnetic Control Scheme for Flexible Medical Device Steering**

✚ Achieve force control algorithm of 7 DOFs robot arm with electromagnet end-effector.

✚ Achieve 3-D navigation of the distal tip of continuum robot with a control scheme based on pseudo-rigid-body model.

✚ Submitted to RA-L, as 2nd author.

BSc project Beihang university

Supervisor: Abdelkader El Kamel (Ecole Centrale Lille)

09/2021- 06/2022 **A Hybrid Force-Magnetic Control Scheme for Flexible Medical Device Steering**

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Robot competition Beihang Robot Team

Supervisor: prof. Rong Liu (Beihang university)

2019-2020 **ROBOCON Quadruped Robot Competition** TOP 1 in China **FIRST PRIZE** 1/39

✚ Led the team to design and manufacture a quadruped robot and implement control of a quadruped robot (**team leader**).

✚ Built a model of a 12-degree-of-freedom quadruped robot.

✚ Implemented control algorithm in **ROS** and tested the algorithm in Webots and gazebo simulation.

✚ Used an **extended Kalman filter** to fuse leg kinematic and IMU data to finish the state estimation algorithm of a quadruped robot.

✚ Used MPC (model predictive control) and quadratic programming to finish the quadruped robot's balance control algorithm, which enabled the robot to trot and jump.

2019-2020 **ROBOCON "ROBO RUGBY 7s" Competition** TOP 9 in China, **FIRST PRIZE** 9/118

- ✚ Aimed to design and build two robots that can pick up, pass the rugby, kick the ball passing through a pole, and control the chassis' locomotion and ball-kicking mechanism.
- ✚ Took part in designing the control structure of the whole system by using **freeRTOS in stm32** to implement multi-task scheduling.
- ✚ Finished control algorithm of a 4-steering-wheel chassis, designed a Torsional spring energy storage mechanism to implement fixed-point ball-kicking, using DC brushless servo motor drive to control this mechanism.

2020 - 2021

ROBOCON "Throwing Arrows into Pots" Competition, 3rd Winner, FIRST PRIZE 3/97

- ✚ Aimed to design and build two robots that can throw arrows into pots and defend arrows from rivals, Used **Laser Radar** to collect point cloud data of competition field and used **Hough Transform** to recognize the features of pots to Implement a fixed-point throw of arrows
- ✚ Implemented a portable and extensible control structure of robots in ROS with my teammates, including **robot localization, communication between robots, and target recognition.**

INTERNSHIP EXPERIENCE.

07/2021- present

Institute of Automation, Chinese Academy of Science
Intelligent Minimally Invasive Medical Technology Team, State Key Laboratory of Management and Control for Complex Systems
Position: Intern

- ✚ Participated in the research, design and development of the Bronchoscope magnetic actuated robot
- ✚ Made investigations and read literature, and designed a catheter embedded with a permanent magnet as a micro-soft robot
- ✚ Finish the control algorithm of the micro-soft robot based on Jacobian matrix, Quadratic programming and the kinematics of manipulator

IN-CLASS PROJECT EXPERIENCE

2018-2019

A Design of Personal Urban Mobility Access, Top 1 in school, FIRST PRIZE
Advisor: Prof. Kamran Behdinin

- ✚ Aimed to design a vehicle to resolve the "last mile problem," which refers to a transportation approach from home to the bus station. (Team leader of this project)
- ✚ Improved on the balanced vehicle by adding a specially made wheel, which automatically adapted to the terrain and crossed the steps by attaching spring to the sliding mechanisms on the wheel
- ✚ Used a PID controller to control the posture of the balanced vehicle to keep it balanced by STM32

2020-2021

A Real-time Obstacle Avoidance UAV based on Deep Q Learning in Simulation

- ✚ Aimed to accomplish a training process of UAVs based on the data of Laser Radar and **Deep Q learning**
- ✚ In charge of defining the reward value according to state variables and implementing the training process to ensure cost convergence with given codes.

2020-2021

The final project of Environment perception and path planning of intelligent robot

- ✚ Deployed G mapping, Hector, Orb SLAM algorithm in Turtlebot3 robot and tested Astar, Dijkstra, RRT planner in various environments
- ✚ Optimized the heuristic function of RRT planner, achieved higher efficiency

SKILLS

IELTS: 7.0 (Listening: 7.0; Reading: 7.5; Speaking: 6.5; Writing: 6.5)

Computer Programming: Python, C++, C, MATLAB

Technique in Robotics: ROS, GAZEBO, Webots, SLAM, and Navigation

Technique in AI: Pytorch, Tensorflow, Deep Q-learning, Convolutional Neural Network

Software: Solidworks, CAD, Adams, ANSYS

Microcontrollers: STM32, Odrive, Elmo (brushless servo motor drive)