

Zhuoyuan (Joe) YU

Email: yuzhuoyuan@u.nus.edu | Website: <https://yuj0e.github.io> | Tel: +65 88850740

Research interests: Robotics, Deep Reinforcement Learning, Multi-Agent Systems, UAVs

EDUCATION

National University of Singapore	GPA: 5.0 / 5.0	<i>Singapore</i>
Major: M.Eng. in Mechanical Engineering (By Research), <i>Department of Mechanical Engineering</i>		<i>08/2023-Present</i>
<ul style="list-style-type: none">Core Courses: Linear Systems, Autonomous Mobile Robotics, Advanced RoboticsResearch focus: Robotics, Multi-agent Deep Reinforcement Learning, ControlMaster thesis: Multi-agent Reliable Navigation in Dynamical Environments		
Northwestern Polytechnical University	GPA: 84%	<i>Xi'an China</i>
Major: B.Eng. in Aircraft Design and Engineering, <i>School of Aeronautics</i>		<i>09/2019-07/2023</i>
<ul style="list-style-type: none">Scholarship: Second Prize Scholarship Excellent Student LeaderCore Courses: Aerodynamics, Automatic Control Theory, Mathematics Analysis, Linear AlgebraNPU School of Aeronautics Student Union President <i>04/2021-06/2022</i>International Internet+ College Students Innovation and Entrepreneurship Competition <i>National Gold Award</i>“Huamo Cup” National College Students Flight Simulation Championship <i>National Third Prize</i>		

RESEARCH EXPERIENCE

Multi-Agent Path Finding Based on Deep Reinforcement Learning	<i>05/2024-Present</i>
[Agency for Science, Technology and Research] <i>Supervisor: Guo Hongliang</i>	
<ul style="list-style-type: none">Improved the existing Node2Vec algorithm to handle the dynamic topological networks better.Utilized Graph Attention Networks to enhance the decision-making weights of dynamic edges.Integrated reinforcement learning for online training of the network.	
<i>Related:</i> Python, Pytorch, ROS1, Multi-Agent Systems, Graph Attention Networks, Natural Language Processing	
Design and Control of Manta Ray Robot (Bioinspired Underwater Robot)	<i>08/2023-Present</i>
[NUS ME Control and Mechatronics Labs] <i>Supervisor: Chew Chee Meng</i>	
<ul style="list-style-type: none">Designed a new type of buoyancy system and mass adjustment system for the Manta Ray robot.Improved original single-degree-of-freedom pectoral fin to dual-degree-of-freedom, enhancing controllability.Upgraded Arduino-based control system to include control of the buoyancy system and the pectoral fins.	
<i>Related:</i> Python, Arduino, SolidWorks, Bioinspired Robotics	
Quadcopter Overall Design and Trajectory Re-planning	<i>07/2020-09/2021</i>
[NPU Aircraft Design and Testing Technique Engineering Laboratory] <i>Supervisor: Wang Ban</i>	
<ul style="list-style-type: none">Designed and made a quadcopter unmanned aerial vehicle (UAV).Studied the trajectory re-planning and obstacle avoidance of UAVs.	
<i>Related:</i> MATLAB, XFLR5, Catia, Aerodynamics	

SELECTED PROJECTS

[*Project Website*](#)

Autonomous Mobile Robotics [GitHub] <i>ROS1, Python, OpenCV</i>	<i>01/2024-04/2024</i>
<ul style="list-style-type: none">Navigate the robot to the designated location and specified pattern integrating vision recognition.	
Manipulator Simulation [GitHub] <i>MATLAB, Kinematics</i>	<i>03/2024-04/2024</i>
<ul style="list-style-type: none">Establish a robotic arm model, then use inverse kinematics to calculate the corresponding joint angles.	

PUBLICATIONS (* corresponding author)

Multi-Robot Reliable Navigation in Uncertain Topological Environments with Graph Attention Network	<i>Under Review</i>
<i>Related:</i> Multi-agent System, Graph Neural Networks, Deep Reinforcement Learning	

SKILLS

Programming Language: Python (Proficient), MATLAB (Proficient), C++ (Intermediate), Arduino (Beginner)

Robotics Related: ROS1 (Intermediate), Gazebo (Beginner), SolidWorks (Proficient), Catia (Intermediate)

Others: Latex, Tableau, Visio, Origin, Adobe Premiere Pro, SPSS, Photography