Jiahui Yang

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EDUCATIONS

Massachusetts Institute of Technology (MIT), Cambridge, MA, USA *Aug 2021 - Jun 2022*
One-Year Exchange Program (GPA 5.0/5.0)
Core Courses:
Machine Learning, Introduction to Robotics(Robot Modeling and Control),
Numerical Computation, Feedback System Design,
Electronics for Mechanical Systems, Power Electronics, Product Engineering Process

Southern University of Science and Technology (SUSTech), Shenzhen, China *Aug 2019 - Jun 2023*
Bachelor in Robotics Engineering (GPA: 3.94/4.0 Ranking: 1/66)
Core Courses:
Robot Operating System, Modern Control and Estimation,
Data Structure and Algorithm Analysis, Signals and Systems,
Fundamentals of Machine Design, CAD and Engineering Drawing, Engineering Mechanics

PUBLICATIONS AND PATENTS

Liu, J. ; Ouyang, Z. ; **Yang, J.** ; Chen, H. ; Lu, H. ; Zhang, W.* Coordinated Defense Allocation in Reach-Avoid Scenarios with Efficient Online Optimization. Submitted to T-RO (IEEE Transactions on Robotics)

Ren, Z. ; **Yang, J.** ; Kim, S. ; Hsiao, Y. ; Lang, J. ; Chen, Y.* A lightweight high-voltage boost circuit for soft-actuated micro-aerial-robots. ICRA 2023 (IEEE International Conference on Robotics and Automation)

China Invention Patent No: 202111241426.2, PASA(Parallel and Self-Adaptive) and COSA(Coupled and Self-Adaptive) hybrid grasping mode-switchable underactuated robot finger. Published under review Inventors: **Yang, J.** ; Zhang, W.

China Utility Model Patent Notification to grand patent right: CN 216266087 U, PASA and COSA hybrid grasping mode-switchable underactuated robot finger. Apr 12, 2022 Inventors: **Yang, J.** ; Zhang, W.

RESEARCH EXPERIENCES

Wheel-Legged Hybrid Robot Control and Locomotion (Bachelor's Thesis) **Shenzhen, China**
Bachelor's Thesis at SUSTech *Dec 2022 - May 2023*
Worked under supervision of Professor Wei Zhang (CLEAR Lab)

- Built the high-level control algorithm for whole body control and the low-level communication framework for motor control
- Designed control algorithms for the robot in wheel-foot motion mode and point-foot motion mode
- Realized the mode switch between wheel-foot mode and point-foot mode in MuJoCo simulation and did experiments on the hardware platform

Multi-Agent Planning Algorithm & Simulation in ROS **Shenzhen, China**
Undergraduate Research at SUSTech *Jan 2022 - Nov 2022*
Worked with Postdoc Junwei Liu in Professor Wei Zhang's lab (CLEAR Lab)

- Built the simulation platform, designed the algorithms in Python according to Junwei's theoretical derivations, and applied it to robots in ROS Gazebo simulation
- Built the communication framework for ROS nodes to control all the robots in simulation
- Created real-time visualization for the planning process, illustrating robots' trajectories and their safe-reachable-sets
- Submitted a paper for T-RO as the third author

A lightweight high-voltage boost circuit for soft-actuated micro aerial robots **Cambridge, MA, USA**
UROP (Undergraduate Research Opportunities Program) at MIT *Jan 2022 - Jun 2022*
Worked with Ph.D. Zhijian Ren in Professor YuFeng Chen's lab (SMRL Lab)

- Designed of a circuit to convert a low voltage DC input into a high voltage and high frequency output for driving the robot actuators
- Implemented a circuit topology to read feedback data and added control algorithms written in C in the Arduino IDE
- Made circuit simulation in MATLAB and trained control parameters
- Assisted in designing, fabricating, soldering and testing PCB (Printed Circuit Board) layout
- Submitted a paper for ICRA 2023 as the second author (accepted)

Mobile Robot Navigation and Mechatronics System Design **Cambridge, MA, USA**
'2.12 Introduction to Robotics' Course Project at MIT *Jan 2022 - Jun 2022*
Group project, Lab Instructor: Professor Harry Asada & Professor Kamal Youcef-Toumi

- Received individual 'Award of the Most Valuable Engineer'
- Won the second place and 'the Best Hardware Design Award' as a team
- Highly involved in the front-loader mechanical design for fake rubber regolith collection.
- Designed and coded teleoperation and autonomous navigation in ROS (Robot Operating System) in Python to achieve keyboard control of the robot as well as self-navigation of the robot based on Apriltags.

Mode-Switchable Underactuated Robot Finger Design **Beijing, China**
Tsinghua University Summer Internship *Jun 2021 - Aug 2021*
Independent research project, Superviser: Professor Wenzeng Zhang

- Implemented the worm and gear mechanism to allow certain freedom for the switching process without losing robustness of the system.
- The underactuated design in the finger enabled a self-adaptive property to achieve better grasping effects.
- Made CAD (Computer Aided Design) drawings in SOLIDWORKS and applied for two patents

HONORS AND AWARDS (SUSTech)

Top Ten Graduates from the Engineering College (10 out of 700) *Jun 2023*
Zhicheng Scholar (Best student of the year in Zhicheng College, 1 out of 180) *Sep 2022*
Finalist Prize in ICM competition (Top 1~2% among 26,000 teams) *Jan 2021*
First Class Merit Scholarship *Sep 2020 & Sep 2021*
Excellence Freshman Scholarship *Sep 2019*

LEADERSHIP ACTIVITIES

President of SUSTech Western Music Club and SUSTech Symphony Orchestra **Shenzhen, China**
SUSTech club and orchestra president *Sep 2020 - Aug 2021*

- Established new rules and regulations and identified everyone's duties, organized weekly rehearsals and activities, sought sponsorship and performance opportunities from other departments
- Organized two campus-wide concerts with a total sponsorship of RMB 30,000 (equivalent of $ 4,200)
- Helped the club to be selected as the top 10 outstanding clubs in SUSTech

SKILLS

Programming Languages: Matlab, Python, ROS, C++, C, JAVA
Software: Solidworks, AutoCAD, Arduino, LTSpice, Altium Designer
Fabrication: Laser-cutting, 3D Printing, Soldering