# Yuhao Zhou

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## Research Interests Education

Mobile Robots, Disaster-response Humanoid Robots, IoT & Networks, Machine Learning

### Nanyang Technological University

Singapore

- M.Sc. in Computer Control & Automation

01/2021 - 12/2021(expected)

- School of Electrical and Electronic Engineering

### Northeastern University

Boston, MA, USA

- Department of Electrical & Computer Engineering

06/2020 - 08/2020

- GPA: 3.33/4.0

## Guangdong University of Technology

- B.Eng., Department of Electrical Engineering

Guangzhou, China. PR

09/2016 - 06/2020

- GPA: 3.3/4.0

#### **Publications**

#### Conference

[1] Zhifeng Huang, Zijun Wang, Jiapeng Wei, Jingtao Yu, **Yuhao Zhou**, Pihao Lao, Xiaoliang Huang, Xuexi Zhang, & Yun Zhang, "Three-Dimensional Posture Optimization for Biped Robot Stepping Over Large Ditch based on a Ducted-fan Propulsion System," in **IROS'20**, [PDF] [Video]

#### Research Experience

Robotics Lab 409, Guangdong University of Technology

10/2018 - 20/2020

PI & Supervisor: Prof. Zhifeng Huang

- Conducted experiments of utilizing the optimized genetic algorithm to minimize the thrust by optimizing the humanoid robot *Jet-HRI*'s posture during 3D stepping to accomplish large obstacle-crossing motion [1]
- Conducting research on flying humanoid robot Jet-HR2 with optimized mechanical, embedded system, and control strategy to accomplish versatile dynamic motions

### Research Projects

#### Mobile Robot: Ares

10/2017 - 01/2018

- Designed and built the mechanical and circuit system of the 15kg mobile robot, alleviated the gyroscopic inertia in manipulation by optimizing the design of the drum spinner weapon system
- Lead a team of 3 & as the manipulator, participated in the first robot combat competition series in China

#### Humanoid Robot: Jet-HR1

10/2018 - 10/2020

- A prototype disaster-response humanoid robot innovatively utilized the ducted-fan propulsion system for balancing the gravitational moment [Video]
- Conduct experiments based in 2D & 3D gaits to accomplish large obstacle-crossing (97% of the robot's leg length, and a height difference of 100mm between two sides)

### Jet-Powered Flying Humanoid Robot: Jet-HR2

01/2019 - 10/2020

- A 10 DoFs disaster-response humanoid robot with 4 ducted-fans installed at the pelvis and feet to have the capacity of flight, contact locomotion, and manipulation
- Individually designed the mechanical system of the robot with special modular joint featured with lightweight, high precision, and high torque
- Implemented dynamic simulations of the prototype robot in PyBullet
- Led the design, fabrication, and experiments of prototype robot such as jet-jumping, hovering, and flying motions
- Algorithm focused on Whole-Body Loco-Manipulation and Aerial Manipulation

Advanced
Course
Projects

TMP1170 Electrical Testing Technology (Guangdong U of Tech) 18 Fall Semester Designed and implemented a high-precision speed detection system for electro-hybrid powered vehicles. Showed that the accuracy of the velocity testing system meets the requirement with a tolerance of less than ±1RPM [Highest Score among 269 students]

EECE7398 ST: Building Blocks for IoT (Northeastern U) 20 Summer Semester Implemented a correlation power analysis (CPA) attack and recover a full round key used in an AES encryption process; Designed, implement and test an orthogonal frequency division multiplexing (OFDM) receiver in the modern wireless communication system [Score 87.8%, B<sup>+</sup>]

## Professional Experience

### CloudMinds Robotics Co., Ltd.

Beijing, China. PR

Hardware Engineering Intern, R&D Department

07/2019 - 08/2019

• Hardware test and optimized modification on the cloud Pepper humanoid service robot manufactured by  $SoftBank\ Robotics$ 

#### Awards

#### Student Awards

Guangdong University of Technology

• Outstanding Bachelor's Degree Graduation Thesis

System Design of Flying Humanoid Robot [PDF] (Top 5%)

06/2020

03/2019

#### Contest Awards

FMB Competition Championship

Organizer: Shanghai Jizhan Sports & Culture Development Co., Ltd.

— The first robot combat series competition held in China, as Team Leader

• 3rd Place, Jiaxing, Autumn Season 10/2017

4<sup>th</sup> Place in Domestic Group, Sanya, All-Star Invitational 01/2018
 Top Eight in International Group, Sanya, All-Star Invitational 01/2018

The 16<sup>th</sup> Challenge Cup

Organizer: Ministry of Education of China

 National College Student Curricular Academic Science and Technology Works Competition, as Team Member

• 3rd Award, School-level

College Students' Innovative Entrepreneurial Training Plan Program

Organizer: Ministry of Education of China

• School-level funded project, NO. XJ2019118451521, as Team Leader 03/2020 [Project Completed with Good Evaluation]

• State-level funded project, NO. 201911845010, as Team Member 03/2020 [Project Completed with Outstanding Evaluation]

Skills

Design - AutoCAD, SolidWorks Programming - Python, MATLAB