Yuhao Zhou

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Research Interests

Humanoid Robot, Mobile Robot, Machine Learning

Education

The University of Tokyo Tokyo, Japan
- M.Eng., Department of Precision Engineering 09/2021 - 09/2023(expected)
- Supervisor: Prof. Jun Ota

Guangdong University of Technology Guangzhou, China. PR
- B.Eng., School of Automation 09/2016 - 06/2020
- Thesis: *System Design of Flying Humanoid.* [PDF]
  Supervisor: Prof. Zhifeng Huang

Nanyang Technological University Singapore
- School of Electrical and Electronic Engineering 01/2021 - 05/2021

Northeastern University Boston, MA, USA
- Department of Electrical & Computer Engineering 06/2020 - 08/2020

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

Jet Power & Humanoid Robot Laboratory 10/2018 - 10/2020
PI & Supervisor: Prof. Zhifeng Huang

- Conducted experiments utilizing the optimized genetic algorithm to minimize the thrust by optimizing the humanoid robot *Jet-HR1*'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

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 on 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 12 DoFs disaster-response humanoid robot with 6 ducted-fans installed at the pelvis and feet to have the capacity of flight, contact locomotion, and manipulation
- Independently 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^+]

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 Award (Top 5%) 06/2020

Northeastern University
- NU's Summer Scholarship 06/2020

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
- 4th Place in Domestic Group, Sanya, All-Star Invitational 01/2018
- Final Eight in International Group, Sanya, All-Star Invitational 01/2018

The 16th 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 03/2019

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