Chenyu Gu

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Education

Georgia Institute of Technology — Atlanta, United States
M. S. in Bioengineering (ECE); — *Aug 2024 - now*

Southern University of Science and Technology — Shenzhen, China
B. S. in Intelligent Medical Engineering; ***GPA: 3.82/4.00*** — *Aug 2020 – Jun 2024*
Relevant coursework: Medical Robotics, Principles of Electrical Circuits, Signals and Systems, Digital Signal Processing, Medical Imaging, Machine Learning, Neural Engineering and Brain-computer Interface.

KTH Royal Institute of Technology — Stockholm, Sweden
Exchange student in Electrical Engineering and Computer Science — *Sep 2023 – Jan 2024*
Relevant coursework: Principles of Wireless Sensor Networks, Social Robotics.

Imperial College London — London, United Kingdom
Data Science Bachelor Summer School; ***Grade: B-merit*** — *Jun 2022 – Aug 2022*

Research Interests

Wearable Technology, Human Movement, Bioelectronics, and Medical Robots.

Publicatios

- **C. Gu*** et al., "IMU-based motion capture system for rehabilitation applications: A systematic review," Biomimetic Intelligence and Robotics, vol. 3, no. 2, p. 100097, 2023, doi: 10.1016/j.birob.2023.100097.
- **C. Gu*** et al., "A Portable Inertial Navigation System for Total Hip Arthroplasty Targeting Direct Anterior Approach" (Currently under review).

Experience

Movement analysis using IMU sensors — Stockholm, Sweden
Visiting Student in Intelligent Heart Technology Lab (I-HeaL) — *Oct 2023 – Jan 2024*

- Extracting gait parameters and human center of mass to explore the relationship between human movement and cardiovascular function.
- Deploy a Kalman filter for orientation estimation and calibrate the angle and direction of the IMU. Also, develop algorithms to extract gait parameters and COM.

Motion Capture for rehabilitation — Shenzhen, China
Project leader in Brain-robot Rehabilitation Lab — *April 2022 – May 2024*

- Integrate ultra-wide band (UWB) technology and inertial measurement unit (IMU) to develop a motion capture system to recovery human motion.
- Help develop Unity visualization and design the python code for signal transmission Apply deep learning enabling sparse motion capture.
- Apply the system on healthy subjects for rehabilitation exercise and evaluate the effectiveness of the system.

Navigation system for surgeries — Shenzhen, China
Project leader in Brain-robot Rehabilitation Lab — *Feb 2022 – Oct 2023*

- Design a surgery navigation system consisting of an on-handle module and an on-body module, equipped with a 9-axis IMU and a gyroscope, respectively.
- Evaluate the effectiveness of the system at both the sensor and system levels.
- Our proposed system has shown effectiveness in meeting the requirements of total hip arthroplasty surgeries via direct anterior approach.

Center of mass estimation and rehabilitation applications — Shenzhen, China
Project Assistant in Brain-robot Rehabilitation Lab — *Oct 2022 – Aug 2023*

- Use IMU motion capture to estimate human three-dimensional center of mass for rehabilitation application.

- Analysis human center of mass to extract the feature of human motion and perform rehabilitation assessment.

Review on motion Capture for rehabilitation Shenzhen, China
Researcher in Brain-robot Rehabilitation Lab *Jun 2022 – Oct 2022*

- Investigate the current application of IMU inertial motion capture technology in rehabilitation and write a review.

Projects

Design a prototype of a cardiopulmonary resuscitation robot Course Project **Grade: A**
Project Leader *Apr 2023 – May 2023*

- Designed a prototype of medical robot for cardiopulmonary resuscitation.
- Finish 3D modeling the drone robot in Solidworks and design robot kinematic and control flow.

Road network visualization of taxi data Course Project **Grade: A**
Project Leader *May 2023 – Apr 2023*

- Visualize the data of taxi driver of Shenzhen and analysis the taxi data.
- Finish data washing to clean the original data and extract the origin-destination data and analyze the desity of taxi order and give possible urban construction plan.

Word representation in biomedical domain Summer School **Grade: B**
Project Assistant in Imperial College London *Jul 2022 – Aug 2022*

- Build deeplearning model for word representation in medical field, using n-gram and skip-gram for modeling and t-SHE for visualization

Awards & Achievements

(School-level)Excellent Graduation Thesis Award Jul 2024
(School-level)Outstanding Student Scholarship of Zhicheng College 2021, 2022, 2023
(Provincal-level)"Internet Plus" College Student Innovation and Entrepreneurship Competition Aug 2023
(School-level)"Internet Plus" College Student Innovation and Entrepreneurship Competition Jul 2022
(School-level)Excellent Team of "Sycamore Tree" Campus Entrepreneurship Star Competition May 2022
(National-level)RoboMaster 2021 Mecha Master Super Competition First Prize Sep 2021
(Top 3 in the major)"Fu Turui" Fellowship, Department of Biomedical Engineering Oct 2021
(Top 4 of the provinve)First Prize of Scholarship for Freshmen Sep 2020

Skills

- **Laboratory:** 3D printing, PCB design, Soldering, Oscilloscope, Signal generator, Motion capture system, Force plate.
- **Programming:** Python(Proficient in data analysis and machine learning), C(For embeded system design), MATLAB(For data analysis), Rust(For system design), Java.
- **Software:** Solidworks(For 3D modeling), JLC-EDA(For PCB design), Unity(Game interface design), Blender
- **Tools:** Git, Neovim, Docker, Jupyter, VS Code, Microsoft Office.

Extracurricular Activities

South university of science and technology archery team Oct 2020 – Oct 2021
Members of School Archery Team *Shenzhen, China*
Join the school-level archery team and organize archery training and competition activities.

Student Union of Zhicheng College, Southern University of Science and Technology Sep 2020 – Jun 2021
Member of the propaganda department The propaganda department of the student union. *Shenzhen, China*
Organize various activities, such as the New Year's Eve party, Nanke Voice, etc.

Languages

- **Chinese:** Native speaker
- **English:** Fluent (TOEFL: 100)
- **Japanese and Germany:** Elementary