

# Yiming Zhong

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## EDUCATION

Southern University of Science and Technology (SUSTech)

Shenzhen, China

Bachelor of Engineering in *Intelligent Medical Engineering*

Expected graduation date: 06/2026

- **Cumulative GPA:** 3.78/4.0 | **Weighted Average Score:** 90.36/100
- **Honors:** Second Class Scholarship for Outstanding Student, 11/2023 & 11/2024  
Outstanding Volunteer Award (235.7 hours of volunteer service, Top 0.5%), 11/2023 & 11/2024

## PUBLICATION

[1] **Yiming Zhong**, Ziyan Wu, Yongshen Zeng, Xiaoyan Song, Qiqiong Wang, Wenjin Wang. **Camera-based Analysis of Motion Coordination Between Infant Left and Right Limbs: A Clinical Study in NICU**. 47th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2025.

[2] Ziyan Wu, **Yiming Zhong**, Chuchu Liao, Xiaoyan Song, Qiqiong Wang, Wenjin Wang. (submitted). **A Pilot Clinical Study to Understand the Relationship between General Movements and Ultra-Short-Term HRV of Neonates**. IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI 2025).

## RESEARCH EXPERIENCE

SUSTech Contactless Healthcare Lab | Camera-based Contactless Health Monitoring

Shenzhen, China

Research Assistant, Advisor: Dr. Wenjin Wang

**Project: Contactless Smart Infant Sleep Monitoring System**

02/2025 - Present

- Developed a multispectral physiological imaging system for precise, contactless monitoring of infant vital signs, in collaboration with a leading hospital in Wenzhou.
- Established an interpretable video-based sleep/wake classification model to enhance monitoring accuracy from consumer-grade to clinical-grade standards.
- Leveraged ECG and PPG signals to extract and validate infant motion metrics for preliminary sleep analysis.
- Deployed open-source human pose estimation and optical flow algorithms to compute key-point motion features, confirming feasibility of camera-based polysomnography (PSG) for infant sleep staging.
- Conducted camera-based PSG monitoring on 100 infants to establish normative sleep-stage benchmarks.
- Extracted limb movement coordination and intensity features from video data, applying SVM and Random Forest classifiers for binary and multi-class sleep-stage classification.
- Applied DL algorithms (LSTM, Transformer) to improve the accuracy of infant sleep stage classification.

**Provincial Project: Multidimensional Video-based Contactless Infant Seizure Monitoring**

04/2024 - Present

- Developed a real-time monitoring and prediction algorithm for infant seizures in collaboration with a leading tertiary hospital in Guangzhou, aiming to establish a low-cost, contactless detection system to mitigate resource limitations and inconsistencies in seizure diagnosis quality.
- Preprocessed raw ECG signals to extract heart rate and calculate heart rate variability (HRV).
- Utilized remote photoplethysmography (rPPG) to extract heart rate and HRV from video data for non-invasive physiological monitoring.
- Applied optical flow techniques to analyze global and skin-region motion in vEEG videos.
- Deployed open-source human pose estimation tools to detect infant keypoints and compute motion intensity.

- Analyzed limb movement intensity using cross-correlation and Pearson correlation coefficients to integrate motion and physiological signals.
- **Innovation:** Introduced a camera-based solution for NICU settings, enabling contactless monitoring of infant motion and physiological metrics with improved precision and efficiency.

## SELECTED PROJECT

### SSVEP-based BCI Robotic Car Control System with MATLAB

Shenzhen, China

Team Member, Advisor: Dr. Peng Cheng

11/2024 - 01/2025

- Collected EEG signals from occipital regions using gold cup electrodes and a Cyton board (250 Hz).
- Applied Butterworth filters for noise reduction and extracted key EEG components (4–35 Hz).
- Implemented and compared CCA and FFT methods to decode SSVEP frequencies with high accuracy.
- Transmitted motion commands via Bluetooth to demonstrate reliable and precise human-machine interaction.

### MATLAB-based ECG Signal Acquisition and Processing

Shenzhen, China

Team Member, Advisor: Dr. Peng Cheng

09/2024 - 11/2024

- Developed a user-friendly prototype for heart health monitoring, emphasizing real-time analysis and ease of use.
- Built a differential circuit and analogue filtering system for accurate ECG signal measurement.
- Integrated the AD8232 Heart Rate Monitor and MATLAB to process ECG signals via an NI USB 6009 module.
- Configured a MATLAB GUI for real-time sampling, noise removal, and enhanced waveform analysis.

## VOLUNTEER & LEADERSHIP

### Community Service Department, Shuren College

Shenzhen, China

Leader

09/2023 – 09/2024

- Coordinated 580 volunteers across 11 community programs, collectively contributing 2,850 service hours.
- Organized the 2023 Summer Teaching Program in Lianping county, crafting lesson plans and leading hands-on activities that blended science, sports, and life skills to inspire and empower students.

### “Heart-to-Heart” Volunteer Teaching Program in Longchuan County

Longchuan, China

Organizer

07/2024

- Designed a program benefiting 102 primary school students, overseeing planning, implementation, and evaluation.
- Drafted activity proposals, developed contingency plans, recruited and trained volunteers, and scheduled logistics.
- Managed daily operations, including logistics coordination, class assignments, volunteer briefings, and student feedback collection.
- Prepared financial documents, drafted research reports, and delivered program outcome presentations.

## SKILLS

- **Programming Language:** Matlab, Python, C/C++
- **Language:** Mandarin (native), English (IELTS 7.5)