JIACHENG LIU(JASON)

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EDUCATION

Tsinghua University, China *Sep 2021 – Jun 2025*
Bachelor of Creative Design and Intelligent Engineering (CDIE), Xinya College (GPA: 3.96/4.00)

Cornell university, United States *July 2024 - Oct 2024*
Research Intern of information science

SKILLS

Programming Languages:	Python, C, C++, MATLAB, shell
Hardware Programming:	Verilog, Arduino, Quartus II, Multisim
Modeling & UI Design:	Photoshop, AutoCAD, Solidworks, Indesign, Figma
Other:	Soldering, Concept Design, 3D printing, User Study, Laser Cutting

RESEARCH EXPERIENCE

Identity authentication based on photoplethysmography (PPG) *Oct 2023 - Sep 2024*
Project co-leader *Tsinghua University, China*
- Designed modules for efficient PPG feature extraction based on the optical principles of PPG signal.
- Designed a multitask learning model for simultaneous PPG signal quality assessment and feature extraction.
- Carried out a scheme that only needs motion labels of PPG signals to train PPG quality detection models.
- Conducted generalization validation across sessions, sensors, and subjects.

Silent speech recognition using low-power active acoustic sensing *July 2024 - Oct 2024*
Research intern *Cornell University, United States*
- Addressed the issue of insufficient training data by utilizing voiced audio and cross-modal learning.
- Introduced a voiced audio encoder to use voiced audio to aid in semantic comprehension.
- Reduced the disparity between different modalities in cross-modal learning by introducing two cross-modality losses.
- Applied a dynamic time warping(DTW) algorithm to create additional data pairs in the latent space, providing the model with enhanced supervision.

Speech synthesis using electrolaryngeal voice *July 2024 - Oct 2024*
Research intern *Cornell University, United States*
- Designed a scheme to address the issue of lack of temporally aligned data pairs.
- Applied a latent space DTW method to further tackle the alignment problem.
- Proposed a training scheme to generate high-quality speech using only the generated data pairs.
- Conducted data collection and cross-subject voice synthesis experiments.

Camera-Based Remote Physiology Sensing *Jan 2024 - Feb 2024*
Research fellow *Tsinghua University, China*
- Used the PPG Toolbox to conduct batch experiments and identified the optimal number of subjects for training the remote photoplethysmography (rPPG) model.
- Concluded that skin tone diversity in the training set has a significant impact on rPPG model performance through data analysis.

Odor Sequences Generation for Movies Based on Large Language Model *Mar 2023 - Sep 2023*
Research fellow *Tsinghua University, China*
- Developed a prototype for real-time content recognition in videos based on the CLIP model.
- Set up a demo device using an ultrasonic atomizer for experimental purposes.
- Participated in organizing user experiments to study whether providing real-time olfactory experiences in VR devices enhances the overall experience.

PUBLICATION

Exploring Efficient and Reliable PPG Authentication in Daily Scenarios *CHI. 2025*
*Jiankai Tang, **Jiacheng Liu***, RENLING TONG, Kai Zhu, Zhe Li, Junliang Xing, Yuanchun Shi, Yuntao Wang*
- Submitted

Camera-Based Remote Physiology Sensing for Hundreds of Subjects Across Skin Tones *CHI Workshop PhysioCHI. 2024*
*Jiankai Tang, Xinyi Li, **Jiacheng Liu**, Xiyuxing Zhang, Zeyu Wang, and Yuntao Wang*

OdorAgent: Generate Odor Sequences for Movies Based on Large Language Model *IEEE VR Papers program. 2023*
*Yu Zhang, Peizhong Gao, Fangzhou Kang, Jiaxiang Li, **Jiacheng Liu**, Qi Lu, and YINGQING XU*

HONOR AND GRANTS

Tsinghua University Scholarship
- Comprehensive Merit Scholarship *Oct.2022*
- Comprehensive Merit Scholarship *Oct.2023*

Research assistance fund
- Tsinghua University Academic Advancement Plan project *Oct.2024*
- Beijing Natural Science Foundation *Oct.2023*