

# SIQI ZHANG

Carnegie Mellon University

Ph.D. in Electrical and Computer Engineering

Personal Website: <https://siqizhang9.github.io/Portfolio/>

## EDUCATION

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### Carnegie Mellon University

2025 - Present

Ph.D. in Electrical and Computer Engineering

Advisor: Justin Chan, Mayank Goel

### Tsinghua University

2021 - 2025

B.E. in Intelligent Engineering and Creative Design (CDIE)

*Coursework primarily Electrical Engineering and Computer Science, Mechanical Engineering and Industrial Design*

Cumulative GPA: 3.99 (Rank: 1)

## RESEARCH EXPERIENCE

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### LubDubDecoder: Bringing Micro-Mechanical Cardiac Monitoring to Hearables

July. 2024 - Sept. 2025 / Research Assistant

Advisor: Justin Chan, Mayank Goel

- Contribution: Led the design of *LubDubDecoder*, a system that enables fine-grained monitoring of micro-cardiac vibrations associated with the opening and closing of heart valves across a range of hearables.
- Approach: Developed machine learning algorithm to perform fine-grained SCG and GCG waveforms from ear-based heart sounds which generalizes across different hearable designs. Repurposed built-in speakers in hearables into a microphone to capture heart sounds from the ear.
- Achievement: Achieves correlations of 0.88–0.95 compared to chest-mounted reference measurements, and generalizes to unseen hearables using a zero-effort adaptation scheme.

### EchoVoice: Synthesizing Speech Voice from Skin Deformations using Flow-based Variational Auto-Encoder

Oct. 2023 - Feb. 2024 / Research Assistant

Advisor: Cheng Zhang

- Contribution: Developed a speech synthesis system for patients unable to speak which synthesizes highly personalized voice directly from skin deformations captured through active acoustic sensing.
- Approach: Designed a deep learning pipeline that could directly synthesize natural-sounding speech from acoustic reflections from the user's mouth, using variational auto-encoders and neural vocoders.
- Achievement: Achieved high-quality speech synthesis that's accurate in conveying information with evaluation scores (PESQ, WER, etc.) comparable or superior to prior work, while preserving nuances in the speech including speed, tone and stutter.

### Thermotion: Design and Fabrication of Objects with Programmable Thermal Behaviors

Mar. 2023 - July 2023

Advisor: Haipeng Mi

- The project proposed a new surface structure for dynamic color-changing display on object surfaces based on temperature differences, utilizing liquids as the heat transfer medium in embedded flow channels.
- In the project, I designed fluidic channels for 3D modeling and printing, assembled 3D-printed parts for experiments and conducted user study.

## PUBLICATIONS AND MANUSCRIPTS

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### **LubDubDecoder: Bringing Micro-Mechanical Cardiac Monitoring to Hearables**

Siqi Zhang, Xiyuxing Zhang, Duc Vu, Tao Qiang, Clara Palacios, Jiangyifei Zhu, Yuntao Wang, Mayank Goel, Justin Chan

*Under Review*

### **DropleX: Liquid sensing on tablet touchscreens**

Siqi Zhang, Mayank Goel, Justin Chan

*Under Review*

### **EchoVoice: Synthesizing Speech Voice from Skin Deformations using Flow-based Variational Auto-Encoder**

Ruidong Zhang, Siqi Zhang, Ke Li, Babak Sadoughi, Sam Tilson, Francois Guimbretiere, Cheng Zhang

*In Preparation*

## HONORS AND GRANTS

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<b>National Scholarship</b> (top <b>0.2%</b> among undergrads in China )	2022
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<b>Optics Valley Scholarship of China</b> (less than <b>60</b> students in China get awarded every year)	2023
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<b>Tsinghua Outstanding Student Leader</b> (awarded to <b>only 1</b> student every college)	2022
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<b>Tsinghua University Scholarship</b>	2022
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## TECHNICAL SKILLS

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<b>Programming languages</b>	C, C++, Python, MATLAB, HTML, CSS, JavaScript
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<b>Hardware languages</b>	Verilog, Arduino, STM32, QuartusII
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<b>Design Tools</b>	SolidWorks, OnShape, AutoCAD, PhotoShop, Figma
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<b>Technical Skills</b>	Signal Processing, Machine Learning, 3D Modeling, User Interface (UI) Design Web Design
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## LANGUAGE LEVELS

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<b>Toefl iBT</b>	116/120
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