Hoang “Charlie” Vuong

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EDUCATION

PhD. in Computer Engineering, *University of Texas at Arlington, Arlington, TX* **Expected May 2027**

Research Area: Human-Computer Interaction, Digital Fabrication, Creativity Support Tools, Biomedical Sensing and Medical Devices

Advisor: Dr. Cesar Torres (CSE)

MSc. in Electrical Engineering, *California State University-Fullerton, Fullerton, CA* May 2022

Advisor: Mostafa Shiva (ECE)

Bachelor of Electrical Engineering with Minor in Computer Science

University of Minnesota-Twin Cities, Minneapolis, MN December 2019

PUBLICATION

Conference Papers:

- ***(Honorable Mention - Top 5%)*** **Vuong, H**; Torres, C. RheoMaps: Mapping Inks, Gels, Pastes, and Slurries in the Rheological Embedding Space using Retraction-Extrusion Pressure Sensor Vectors. In *Proceedings of the 2025 ACM Conference on Human Factors in Computing Systems* (Yokohama, Japan, 2025), CHI ’25.
- (Under Review) Lebdeh, M; Gardner, M; Vuong, H; Emerson, A; Torres, C. Rheocast: Supporting Slip Casting Practice through Fluctuation-based Rheological Sensing. Proceedings of the 2026 ACM Conference on Human Factors in Computing Systems (Barcelona, Spain, 2026), CHI’26.
- Liao, L; **Vuong, H**; Torres, C; et al. TacitCaptions: Externalizing Tacit Skills within Neon Glass Bending Practices through Video Synchronized Sensory Augmentation Cues. Glass Art Society Conference 2025, Texas.
- Sarafan, S; Cao, H; **Vuong, H**; et al. "A Novel ECG Denoising Scheme Using the Ensemble Kalman Filter," 2022 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), Glasgow, Scotland, United Kingdom, 2022, pp. 2005-2008, doi: 10.1109/EMBC48229.2022.9871884.
- Wang, J.-P.; Wu, K.; **Vuong, H**.; et al. Magnetic Particle Spectroscopy-Based Handheld Device for Wash-Free, Easy-to-Use, and Solution-Phase Immunoassay Applications. DMD2020-9054, V001T10A011; 6 Apr. 2020.

Abstract and Poster:

- **Vuong, H**; Torres, C. FrostSense: A Vacuum Retraction Viscosity Sensing Method for Soft Material Human-in-the-Loop Fabrication. *Innovation Day, CSE UTA*, *2023.* ***Honorable Mention Award.***
- **Vuong, H**; Torres, C. RheoMap: Mapping Inks, Gels, Pastes, and Slurries within a Rheological Embedding Space using Retraction-Extrusion Pressure Sensor Vectors. *Student Computing Research Festival (SCRF), UTA's College of Engineering*, *2025* - ***Honorable Mention Lightning Talk Award.***

RESEARCH EXPERIENCE

Visiting Graduate Researcher at UCI, Advisor: Dr. Hung Cao

Hero Lab, University of California, Irvine, CA May 2025 – Present

- Developing wearable Speckle Plethysmography (SPG) device using reflecting method for arm and wrist.
- Building open SPG dataset with ECG for blood-pressure prediction and heart rate variability.
- Re-designing wearable fetal ECG (fECG) and collecting fECG data in UCI Medical Center.

Graduate Researcher at UTA, Advisor: Dr. Kytai Nguyen

Nanomedicine and Tissue Engineering Laboratory, University of Texas at Arlington, TX Sep 2024 – Present

Research on the gelation time of hydrogels for adhesive nanocomposites in biomedical applications.

- Developing a portable bio-fluid sensing device for characterizing hydrogels.
- Evaluating hydrogels-chitosan for optimal curing time for formulated bio-nanocomposites with cross-linkers.
- Applying signal processing and classification techniques to predict the curing time of hydrogels.

Ph.D Researcher at UTA, Advisor: Dr. Cesar Torres (CSE)

The Hybrid Atelier, University of Texas at Arlington, TX Feb 2023 – Present

Research on "RheoMapp" - fluid materials sensing technique and material interaction devices:

- Developed Pneumatic Retraction-Extrusion method for fluid sensing.
- Implemented hardware/firmware using ESP32 ThingPlus for Qwiic Pressure Sensor, IMU and microSD socket.
- Constructed wireless data collection with Websocket, MongoDB, and React for real-time sensing and feedback.
- Signal processing included segmentation, features extraction, and material classification (PCA, T-SNE and LDA).

Research Electrical Engineer Intern Feb 2021 – July 2022

Sensoriis and Hero Lab, Calit2, University of California, Irvine, CA

- Firmware developed for the BLE nRF52832 with the ADS1299 for hardware medical sensing devices.
- Implemented signal processing and classification techniques for analyzing local field potentials in rodents.
- Evaluated ECG denoising methods with ExKF/EnKF filtering methods for zebrafishes.

Graduate Research Assistant, Advisor: Dr. Ana Doblas and Dr. Cong Van July 2021 – Sep 2021

Optical Imaging Research Lab, University of Memphis, Memphis, TN

- Developed and implemented an alignment procedure for a Selective Plane Illumination Microscope (SPIM) using the liquid lens to change the position of the illumination focus.
- Designed the automated linear translation system for objective lens and microscopy camera in SPIM system using motorized control.
- Collected data of fluorescent samples from SPIM systems and reconstructed images using Matlab.
- Applied U-Net and GAN models to improve performance of 2D/3D reconstruction algorithms of Structured Illumination Microscopy (SIM).

Research Electrical Engineers, Advisor: Dr. Kai Wu May 2019 – Dec 2019

Team MagiCoil, University of Minnesota - Twin Cities, Minneapolis, MN

- Researched on magnetic particle spectroscopy portable devices for sensing for bio-fluid and detection.
- Designed Lock-in Amplifier and Bandpass filter using ADS1675 and PIC32 for magnetic nanoparticle responses.
- Implemented hardware for controlling and processing signals of magnetic particle spectroscopy devices.

Undergraduate Research Engineer at UMN Sep 2019 – Dec 2019

Neuromodulation Research Center, University of Minnesota - Twin Cities, Minneapolis, MN

- Re-designed the mechanical and electrical setup for Deep Brain Stimulation system with ultrasound catheter.
- Implemented Basler Area Scan Camera with in-vivo measuring 16 channel EEG for patient study cases.

INDUSTRY

R&D Engineer Intern, *ACIST Medical Systems, Eden Prairie, MN* May 2019 – Sep 2019

- Wrote embedded firmware scripts for Arduino to detect and control I/O.
- Developed GUI to interface with X-Ray simulator hardware in LabVIEW using a producer-consumer structure.
- Performed test protocol validation and mechanical performance testing on imaging catheters.
- Implemented Arduino Mega to simulate an X-RAY system through Imaging System Interfaces communication.

AWARDS AND GRANTS SUPPORT

- ***Honorable Mention Award - top 5% paper for ACM CHI 2025 (RheoMap)***
- Travel Grant from CSE Dept/Dean Office, UT Arlington for ACM CHI 2025 in Yokohama, Japan.
- Honorable Mention Award, Lighting Talk at Student Computing Research Festival (SCRF) at UT Arlington, 2025.
- Graduate Research Mentor for ***REU Site: Hybrid Design and Fabrication, REU NSF*** for Summer 2023 and 2024
- Travel Grant from ***Sustaining Cognitive Flow in Physical Making, CRII NSF Grant*** for ACM DIS 2023.
- Honorable Mention Award, Innovation Day at CSE UT Arlington, 2023.

TEACHING

Graduate Teaching Assistant, *Department of Computer Science, UT Arlington, TX*

- CSE 1320: Intermediate Programming [>20 students] - Fall 2023.
- CSE 5360: Artificial Intelligence I [>60 students] - Fall 2022/Spring 2023
- CSE 1325: Object-oriented programming [>60 students] - Spring 2024/Fall 2024/Spring 2025/Fall 2025

SERVICE

Peer Reviewer: 32 reviews for ACM SIGCHI Conference

- CHI - Human Factors in Computing Systems 2023 and 2025 - **1 Special Recognition for Outstanding Reviews**
- DIS- Designing Interactive Systems 2025 - **1 Special Recognition for Outstanding Reviews**
- TEI - Tangible, Embedded, and Embodied Interaction 2024, 2025 and 2026
- MobileHCI 2023, 2024 and 2025 - **4 Special Recognition for Outstanding Reviews**

- Creativity & Cognition 2025 - **1 Special Recognition for Outstanding Reviews**
- UbiComp 2023 and 2024
- CSCW - Computer-Supported Cooperative Work & Social Computing 2025
- VRST - Symposium on Virtual Reality Software and Technology 2024
- SUI Symposium on Spatial User Interaction 2025
- The ACM PACM HCI Interactive Surfaces and Spaces (ISS) 2025

Mentorship:

- Undergraduate Research Students (UGRS) in Spring 2023 in UTA
- NSF REU Hybrid Design and Fabrication Site Summer 2023 and 2024 at Hybrid Atelier in UTA
- Computing Research Association - CRA UR2PhD Program Fall 2025

INVITED TALKS

University of Science VNU-HMC | Host by Prof. Duy Khanh Le

"RheoMap: Mapping Inks, Gels, Pastes, and Slurries within a Rheological Embedding Space"

International University VNU-HMC | Host by Prof. Chi Thanh Vi

"RheoMap: Mapping Inks, Gels, Pastes, and Slurries within a Rheological Embedding Space"

TECHNICAL SKILLS

Languages: Python, C/C++, MATLAB, Verilog

Data Processing: LabVIEW, Jupyter Notebook, Google Colab

Cloud & Web: MongoDB, WebSocket, React, Node.js, GitHub

Embedded Programming: C/C++ (Arduino, ESP32, STM32, PIC32, ARM Cortex-M4F), MPLAB X, Segger

Wireless Communication: WiFi, Bluetooth, BLE nRF52

Power & Circuit Design: Power Management, Analog/Digital I/O, Schematic Capture

PCB Design Tools: Altium Designer, KiCad, Eagle, Flux

EE Simulation: PSpice, LTSpice, OrCAD.

Biomedical Application: EEG, ECG/EKG, EMG, PPG, fNIR and SPG.

Platforms/Devices: Biopac, OpenBCI, ADS1299, Neuroelectrics

DESIGN SKILLS

Digital Fabrication: 3D Printing, Laser Cutting, CNC Milling, Vacuum Forming, Soldering, SMT Assembly, PCB Fabrication (Bantam and Voltera), Polymer Fabrication (silicone and hydrogel)

Craft & Material Work: Ceramics (molding and slip casting), Papermaking

Design Tools: Figma, Adobe CC (Illustrator, Premiere Pro, Express), Fusion 360, openSCAD, Miro

Design Methods: Wireframing, Storyboarding, Design Thinking

Research Methods: Semi-structured Interviews, Workshops, Questionnaire Design, Statistical Analysis.