

Yiran Zhao

I aim to make behavioral health interventions simple, effective, and life-restoring for people living with debilitating anxiety. Having battled anxiety disorders for eight years, I experienced the limitations of today's solutions: medication side effects and high-effort behavioral tools. I am determined to invent something better for the 1 in 5 adults living with anxiety.

My PhD research advanced **sensory intervention**, digital and wearable interventions that subtly modulate symptoms without burdening users. Over six years, I translated science into deployable technology, publishing across top-tier human-computer interaction and behavioral health venues, including IMWUT, CSCW, CHI, and JMIR.

I am now the founder and CEO of **MoonWave Technology**, a venture bringing scientifically grounded, effortless behavioral health interventions to everyday life in memory of a close friend lost to mental illness.

PhD

MoonWave Technology
Cornell Tech — Jacobs Institute
New York, NY

WEBSITE

www.zhao-yiran.me

EMAIL

yiran.zhao@cornell.edu

EDUCATION

- 2025 — Now **Cornell Tech - Jacobs Institute**
Runway Startup Postdoc
- 2019 — 2025 **Cornell Tech**
Ph.D. Information Science
Advisor: Tanzeem Choudhury, Qian Yang, Rana Zadeh
- 2017 — 2019 **University of Washington**
M.S. Biomedical and Health Informatics
Advisor: Wanda Pratt, Ari Pollack, Shwetak Patel
- 2013 — 2017 **Georgia Institution of Technology**
B.S. Biomedical Engineering; minor of Computer Science
Advisor: Hang Lu, Eric Schumacher, Thad Starner

ENTREPRENEURSHIP

- 2025 — Now **MoonWave Technology**
Founder & CEO
- Leading product vision, go-to-market strategy, partnerships, and venture growth to make sensory intervention accessible at scale. Our first product, CalmingBeats, is commercially ready, backed by > 200 customer discovery interviews, deployment pilots, and a clinical partnership.

PUBLICATIONS AND CONFERENCES

- P9 Evaluate Closed-Loop, Mindless Intervention in-the-Wild: A Micro-Randomized Trial on Offset Heart Rate Biofeedback
Yiran Zhao, Tanzeem Choudhury
IMWUT 2024
- P8 Translation Effectiveness of Offset Heart Rate Biofeedback as Mindless Intervention for Alcohol Craving Among Risky Drinkers: Controlled Experiment
Yiran Zhao, Jatin Arora, Yujie Tao, Dave Miller, Alexander Adams, Tanzeem Choudhury
JMIR Formative Research
- P7 BreathePulse: Peripheral Guided Breathing via Implicit Airflow Cues for Information Work
Tan Gemicioglu*, Thalia Viranda*, **Yiran Zhao***, Olzhas Yessenbayev, Jatin Arora, Jane Wang, Pedro Lopes, Alexander T. Adams, Tanzeem Choudhury
IMWUT 2024
*authors with equal contribution in alphabetical order of last names

- P6 Affective Touch as Immediate and Passive Wearable Intervention
Yiran Zhao*, Yujie Tao*, Grace Le, Rui Maki, Alexander Adams, Pedro Lopes, and Tanzeem Choudhury
IMWUT 2023
- P5 Calibrating Clinicians' Trust in AI Decision Support Systems Using Biomedical Literature
 Qian Yang, Yuexing Hao*, Kexin Quan*, Stephen Yang*, **Yiran Zhao***, Volodymyr Kuleshov, Fei Wang
CHI 2023
 *authors with equal contribution in alphabetical order of last names
- C3 The Communal Loom: Integrating Tangible Interaction and Participatory Data Collection for Assessing Well-Being
 Niti Parikh*, **Yiran Zhao***, Maria Alinea-Bravo, Tapan Parikh
CHI 2022: Tangible Interaction for Well-being
- C2 CRAFT @ Large: Building Community Through Co-Making
Yiran Zhao, Maria Alinea-Bravo, Niti Parikh
ISAM 2021
- P4 Support Goal-Based Collaboration for Hospitalized Children
Yiran Zhao, Yoojung Kim, Calvin Apodaca, Regina Casanova-Perez, Shefali Haldar, Sonali R. Mishra, Julia C. Dunbar, Ari Pollack, Wanda Pratt
CSCW 2021
- P3 CASPER: Capacitive Serendipitous Power Transfer for Through-Body Charging of Multiple Wearable Devices
 Edward Jay Wang, Manuja Sharma, **Yiran Zhao**, Shwetak Patel
ISWC 2018
- C1 E-archery: Prototype Wearable for Analyzing Archery Release.
Yiran Zhao, Shanu Salunke, Alexander Leavitt, Kevin Curtin, Nghia Huynh, and Clint Zeagler
Ubicomp 2016
 Best Paper Wearable Sports Workshop
- P2 Investigating the Intersession Reliability of Dynamic Brain-State Properties
 Derek M. Smith, **Yiran Zhao**, Shella D. Keilholz, and Eric H. Schumacher
Brain Connectivity 2018, 8(5), 255-267.
- P1 Reverse-Correlation Analysis of the Mechanosensation Circuit and Behavior in *C. elegans* Reveals Temporal and Spatial Encoding
 Daniel A. Porto, John Giblin*, **Yiran Zhao***, Hang Lu
Nature Scientific Reports 2019, 9(1), 1-14

FUNDRAISING & FELLOWSHIP

- Sept 2022 **Collaborative Research: HCC: MEDIUM: Body as Intervention: Toward Closed-Loop, Embodied Behavioral Health Interventions**
 National Science Foundation
 Award Amount: \$686,879.00
- Sept 2021 **Digital Life Initiative Doctoral Fellow**
 Cornell Tech
- May 2021 **Public Interest Tech Impact Doctoral Fellow**
 Cornell Tech

RESEARCH

- Nov 2023 - Aug 2025 **CalmingMoments: Evaluate Offset Heart Rate Biofeedback as Closed-Loop Intervention In-the-Wild**
Mixed-Method | Micro-randomized Trial | Closed-Loop System Engineering
Cornell Tech; Advised by Tanzeem Choudhury, Qian Yang, and Rana Zadeh
- Designed and engineered a closed-loop system that detects sympathetic activity and activates offset heart rate biofeedback via heart rate monitor and Apple Watch; engineered the mobile system to collect contextual data
 - Designed a micro-randomized trial to evaluate the effect of the intervention and what contextual factors moderate the effectiveness
 - Running the deployment study with 50 participants, each using the system in their free-living environment for a week.
- Published in IMMUT 2024*
- May 2023 - Aug 2024 **BreathePulse: Examining Peripheral Guided Breathing via Implicit Airflow Cue**
Mixed-Method | Behavioral Experiment | Rapid Prototyping
Cornell Tech; Advised by Tanzeem Choudhury, Alexander Adams, and Pedro Lopes
- Designed and prototyped a laptop mounted device that guides slow-breathing via subtle airflow around the nostrils
 - Designed a behavioral experiment and collected data on ~40 participants; Analyzed physiological, self-report, and performance data using Linear Mixed Models; Analyzed qualitative data through thematic analysis
 - Mentored three first-year PhD students to execute the project
- Published in IMMUT 2024*
- May 2022 - Nov 2022 **Guidance Haptics on the Wrist for Eyes-Away Target Acquisition in Mixed Reality**
Mixed-Method | Mixed Reality | Behavioral Experiment
Meta Reality Labs; Advised by Aakar Gupta, Tanya Jonker
- Designed vibrotactile patterns on-the-wrist that intuitively facilitated eyes-away and eyes-free target acquisition in mixed reality
 - Developed the experimental setting in Unity; Conducted behavioral experiments with ~40 participants; Analyzed eye-gaze behavior, eye-hand coordination, task completion benchmarks, and cognitive load; Analyzed target-finding strategy based on think-aloud and
- May 2021 - May 2022 **CRAFT @ Large: Building Community Through Co-Making**
Qualitative | Rapid Prototyping | Co-Design | Informal Methods of Design
Cornell Tech; Advised by Niti Parikh, Deborah Estrin
- Conducted weekly workshops for community members to co-make through informal methods of design; Conducted qualitative interview with recreational and art therapists to understand how therapists design recreational and crafting sessions and assess residents' progression through such sessions
 - Design Unity-based AR interaction to mitigate creators' information on created artifact
- Published in ISAM 2021*
- Feb 2021 - Feb 2023 **BioScholar: Investigating how clinicians use literature as explainable decision support**
Qualitative | Sense-making | Clinical Decision-Making | Human-AI Interaction
Cornell University; Advised by Qian Yang
- Conducted qualitative interview and think aloud sessions with clinicians and clinical librarians to understand how they search, evaluate and make sense of biomedical literature to facilitate decision making at point-of-care; Synthesized implications for how AI-powered clinical decision support systems can improve explainability
- Published CHI 2023*
- Nov 2020 – Nov 2022 **Romotouch: Mitigating stress through affective touch**
Mixed-Method | Rapid Prototyping | Behavioral Experiment | Mental Health Intervention
Cornell Tech; Advised by Tanzeem Choudhury, Pedro Lopes
- Developing wearable actuators to deliver affective touch as a mindless, inherently pleasant stress intervention. Designed and conducting controlled behavioral experiments to evaluate the effect in heart rate variability, subjective stress rating, affects and pleasantness
- Published in IMMUT 2023*

- Feb 2020 – **Cravigator: Mindless craving intervention through vibrotactile heart rate biofeedback**
 Current **Quantitative** | **Sensor Fusion** | **Behavioral Experiment** | **Mental Health Intervention**
 Cornell Tech; Advised by Tanzeem Choudhury, Emanuela Offidani
- Designed and conducting experiment to evaluate the effectiveness of smartwatch-based, stress-lowering vibrotactile heart rate feedback on reducing craving for alcohol and nicotine
 - Developing closed-loop system that detects the usage and craving for e-cigarette and automatically activates stress-lowering intervention to reduce e-cigarette usage.
- Published in JMIR Formative Research*
- Jan 2018 – **Plan&Talk: Supporting collaborative goal-setting for hospitalized adolescent patients**
 Oct 2020 **Qualitative** | **Interface Design** | **Patient Engagement**
 University of Washington; Advised by Wanda Pratt and Ari Pollack
- Designed and developed an interface to facilitate collaborative goal-setting for hospitalized children; Conducted design workshops and expert review workshops
 - Lead a technology probe study to characterize the effect of goal-based on patient-caregiver-care provider collaboration for hospitalized adolescents; conducted semi-structured interviews; coded interview data, observation notes and app usage data
- Published in CSCW 2021*
- March 2018 – **CASPER: Capacitive serendipitous power transfer for through-body charging of multiple wearable devices**
 Sept 2018 **Quantitative** | **Rapid Prototyping** | **System Characterization** | **Wireless Charging**
 University of Washington; Advised by Edward Wang, Shwetak Patel
- Developed digital jewelry prototypes for a capacitive through-body charging system; characterized the charging requirements of the electronics for the jewelry and implemented as tattoos with lights and a charging jacket; developed the design guideline for such system
- Published in ISWC 2018*
- Jan 2016 – **Reverse-correlation analysis of the mechanosensation circuit and behavior in *C.Elegans* reveals temporal and spatial encoding**
 May 2017 **Quantitative** | **Computer Vision** | **Neural Engineering**
 Georgia Institute of Technology; Advised by Hang Lu
- Designed PDMS microfluidic devices; Applied computer vision and system identification techniques to analyze neural imaging data and model the neural circuit in *C. elegans*
- Published in Nature Scientific Reports 2019*
- Sept 2015 – **Investigating the intersession reliability of dynamic brain-state properties**
 May 2017 **Quantitative** | **Machine Learning** | **Cognitive Neuroscience**
 Georgia Institute of Technology; Advised by Derek Smith, Eric Schumacher
- Analyzed functional MRI data of human brain with computer vision and machine learning to identify the activation patterns of brain networks; developed MATLAB-based application for fMRI signal processing and unsupervised learning
- Published in Brain Connectivity 2018*

INDUSTRY AND ENTREPRENEURSHIP

- Summer 2022 **Meta Reality Lab**
 Redmond, WA
 Research Intern; Manager: Aakar Gupta
- Led the investigation on how to design vibrotactile patterns on-the-wrist to intuitively facilitated eyes-away and eyes-free target acquisition in mixed reality; Developed vibrotactile patterns by designing different waveforms for LRAs; Developed the experiment condition in Unity; Designed and oversaw behavior experiments with ~40 participants.
- Summer 2018 **Proteus Digital Health**
 Redwood City, CA
 Algorithm Engineer Intern
- Led the development of algorithms based on sensors in a wearable pill detection patch (ECG, device temperature, skin conductivity and accelerometer) for user activity classification and device attachment quality classification; Implemented such algorithms in iOS and Android application; Conducted on-person field study

Jan 2017 – **Micro-C**

May 2017 Atlanta, GA

Research Intern

- Led the development of a lung function monitoring device and iOS application for pediatric lung disease patients. The system quantified air flow rate using pressure sensors and exhaled gas components using CO₂ sensor, conducted test validity check, and automatically recorded test results to compatible iOS application

Jan 2016 – **E-Archery**

May 2017 Atlanta, GA

Co-Founder and Technical Lead

- Co-founded the company to bring accessible training guidance to archers
- Led the research and development of a smart glove integrating accelerometer and IMU sensor data and machine learning algorithms
- Led the usability testing and user need assessment with 50 archers
- Negotiated cost and fabrication processes with local manufacturers

Sept 2015 – **Invention Studio**

May 2017 Georgia Institute of Technology

Prototyping Instructor

- Instructed, trained and advised students on prototyping with 3D printing, waterjet, laser cutting, electronics and circuits, and various metalwork and woodwork tools

SERVICE & MENTORSHIP

Research Community UbiComp/ISWC International Workshop on Mental Health and Well-being

- Co-organizer (2021-now)

IMWUT, CHI, DIS, JMIR

- Reviewer (2019-now)

Graduate Student Yujie Tao (University of Chicago to Stanford University)
Stephen Yang (Cornell University to University of Southern California)
Xuanbo Jia (Cornell University)
Tran My Kim Dang (Cornell University)
Jane Wang (Cornell University)
Ruitong Liu (Cornell University)

Graduate Courses Ubiquitous Computing
Applied Machine Learning
Data Science in the Wild
Psychological and Social Aspects of Technology
Prototyping Studio of Human-Computer Interaction and Design

K-12 Outreach Infectious Disease Modeling and Vaccine Mechanism for COVID-19
Playful Digital Interaction with Traditional Instruments
Self-Tracking and Prediction of Menstrual Pain: Support Adolescents Female to Design Technology for Themselves

Youth Entrepreneurship 2021 Conrad Challenge (students won Global Finalist)
2022 Conrad Challenge (students won regional Finalist)
2023 Conrad Challenge (students won regional Finalist)

Non-Profit Engineers without Borders Uganda Clean Water Program