

Tan Gemicioglu

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Research Interests

My research focuses on how we can make healthcare effortless via wearable and ubiquitous devices. I design **implicit health interventions** that demand minimal attention and develop **wearable sensing technologies** to measure clinically relevant biosignals. By integrating these approaches, I build closed-loop wearable devices that continuously **monitor and modulate** our health to unobtrusively maintain well-being.

Education

Cornell University – New York City, NY Aug 2023 – May 2028 (Expected)

Ph.D. in Information Science

Advisors: Dr. Tanzeem Choudhury & Dr. Cheng Zhang

Georgia Institute of Technology – Atlanta, GA

Aug 2019 – Dec 2022

B.S. in Computer Science

GPA: 3.89 / 4.0

Intelligence & People concentration, Minor in Physiology

Work Experience

Research Experience

Cornell University People-Aware Computing – Graduate Research Assistant Aug 2023 – Present

Advisors: Dr. Tanzeem Choudhury, Dr. Cheng Zhang

Building wearables for passive health interventions to enable attention-free behavior change, neuro-motor rehabilitation, and physiological strain relief. Studying on-body acoustic sensing for everyday monitoring of blood pressure, muscle activity, and respiratory function.

Georgia Tech Contextual Computing – Graduate Research Assistant

Jan 2023 – Aug 2023

Advisors: Dr. Thad Starner, Dr. Allison Okamura (Stanford University)

Led haptics initiative for skill training and rehabilitation with minimal attention. Partnered with Stanford ME & Neurology to create consumer and clinical haptic gloves, funded by NSF PFI & Convergence.

Georgia Tech Brain Lab – Undergraduate Research Assistant

May 2021 – May 2023

Advisors: Dr. Melody Jackson, Dr. Thad Starner

Developed wearable, non-invasive fNIRS brain-computer interface using body movement. Aided the construction of movement-resistant, robust EEG sensors to allow a wider range of BCI functionality.

Georgia Tech Contextual Computing – Undergraduate Research Assistant

Jan 2020 – Dec 2022

Advisors: Dr. Thad Starner

Created Markov models with 97% accuracy on 1164 words for silent speech interactions in coordination with University of Tokyo and Google researchers. Conducted longitudinal haptic learning studies.

Industry Experience

Microsoft Research – Research Intern

May 2022 – Aug 2022

Advisors: Dr. Mike Winters, Dr. Yu-Te Wang

Built multi-gesture classifier for tongue gesture recognition with 92% accuracy, enabling invisible interactions. Invented new, accessible hands-free interaction for MR devices with multimodal sensing.

Oracle Analytics Cloud – Software Engineer Intern

May 2021 – Aug 2021

Improved UX and designed interactive data visualizations for big data service. Integrated a highly-requested plugin adding dynamic animated displays into product with 1 million users.

Contributed to MVP of prototype standalone console for WebLogic Server. Designed user help system and fixed UI bugs for REST-based web app launched to 7000+ corporations.

Honors and Awards

A17. Cornell Fellowship, Cornell University	Aug 2023
A16. Best Demo Finalist, CHI 2023 Conference	Apr 2023
A15. Gary Marsden Travel Award, ACM SIGCHI	Apr 2023
A14. Student and Postdoc Travel Award, BCI Society	Mar 2023
A13. Donald V. Jackson Fellowship, Georgia Tech College of Computing	Mar 2023
A12. Best Undergraduate Research Award, Sigma Xi	Feb 2023
A11. Best Demo Award, UbiComp/ISWC 2022 Conference	Sep 2022
A10. 2nd Place Oral Presentation Award, UROP Undergraduate Research Symposium	Apr 2022
A9. President's Undergraduate Research Travel Award, Georgia Tech	Mar 2022
A8. President's Undergraduate Research Salary Award, Georgia Tech	Aug 2021
A7. 1st Place Oral Presentation Award, UROP Undergraduate Research Symposium	Apr 2021
A6. Sait Halman Award for Excellence in Computer Science, Robert College	Jun 2019
A5. National Bronze Medal, Turkish Olympiad in Informatics	Nov 2018
A4. ICRA 2018 RoboMasters AI Challenge Finalist, DJI	May 2018
A3. ICRA 2017 Humanitarian Robotics Competition Finalist, IEEE RAS-SIGHT	May 2017
A2. Google Code-in Finalist for Mifos Initiative, Google	Feb 2016
A1. Google Code-in Finalist for RTEMS, Google	Feb 2015

Publications

Full Conference & Journal Papers (Refereed)

- C6. Kian Mahmoodi*, Yudong Xie*, **Tan Gemicioglu***, Chi-Jung Lee, Jiwan Kim, Cheng Zhang. **EchoForce: Continuous Grip Force Estimation from Skin Deformation Using Active Acoustic Sensing on a Wristband**. Proceedings of the 2025 ACM International Symposium on Wearable Computers (ISWC '25). October 2025. [[DOI](#), [PDF](#)]
- C5. Stephanie Cernera*, **Tan Gemicioglu***, et al., Theresa Vaughan**, Davide Valeriani**. **Master classes of the tenth international brain-computer interface meeting: showcasing the research of BCI trainees**. Journal of Neural Engineering. February 2025. [[DOI](#), [PDF](#)]
- C4. **Tan Gemicioglu***, Thalia Viranda*, Yiran Zhao*, Olzhas Yessenbayev, Jatin Arora, Jane Wang, Pedro Lopes, Alexander T. Adams, Tanzeem Choudhury. **BreathePulse: Peripheral Guided Breathing via Implicit Airflow Cues for Information Work**. Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT '24). December 2024. [[DOI](#), [PDF](#)]
- C3. **Tan Gemicioglu**, Elijah Hopper, Brahmi Dwivedi, Richa Kulkarni, Asha Bhandarkar, Priyanka Rajan, Nathan Eng, Adithya Ramanujam, Charles Ramey, Scott M. Gilliland, Celeste Mason, Caitlyn Seim, and Thad Starner. **Passive Haptic Rehearsal for Augmented Piano Learning in the Wild**. Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT '24). December 2024. [[DOI](#), [PDF](#)]
- C2. **Tan Gemicioglu**, R. Michael Winters, Yu-Te Wang, Thomas M. Gable, Ivan J. Tashev. **TongueTap: Multimodal Tongue Gesture Recognition with Head-Worn Devices**. Proceedings of the 25th International Conference on Multimodal Interaction (ICMI '23). October 2023. [[DOI](#), [PDF](#)]
- C1. Naoki Kimura, **Tan Gemicioglu**, Jonathan Womack, Yuhui Zhao, Richard Li, Abdelkareem Bedri, Zixiong Su, Alex Olwal, Jun Rekimoto, and Thad Starner. **SilentSpeller: Towards mobile, hands-free, silent speech text entry using electropalatography**. Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22), April 2022. [[DOI](#), [PDF](#)]

Posters, Demos and Workshop Papers (Refereed)

- D8. **Tan Gemicioglu**, Tanzeem Choudhury. **Autonomic Interfaces for Augmenting Autonomic Processes**. Workshop on Sensorimotor Devices at CHI Conference on Human Factors in Computing Systems (CHI SMD '25), April 2025. [PDF]
- D7. David Martin, Zikang Leng, **Tan Gemicioglu**, Jon Womack, Jocelyn Heath, Bill Neubauer, Hyeokhyen Kwon, Thomas Plöetz, Thad Starner. **FingerSpeller: Camera-Free Text Entry Using Smart Rings for American Sign Language Fingerspelling Recognition**. 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '23), October 2023. [DOI, PDF]
- D6. **Tan Gemicioglu**, Yuhui Zhao, Melody M. Jackson, Thad Starner. **Transitional Gestures for Enhancing ITR and Accuracy in Movement-based BCIs**. Proceedings of the 10th International Brain-Computer Interface Meeting (BCI Meeting '23), June 2023. [PDF]
- D5. **Tan Gemicioglu**, R. Michael Winters, Yu-Te Wang, Thomas M. Gable, Ann Paradiso, Ivan J. Tashev. **Gaze & Tongue: A Subtle, Hands-Free Interaction for Head-Worn Devices**. Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems (CHI EA '23), April 2023. (Best Demo Finalist) [DOI, PDF]
- D4. **Tan Gemicioglu**, Mike Winters, Yu-Te Wang, and Ivan Tashev. 2022. **Tongue Gestures for Hands-Free Interaction in Head Worn Displays**. Proceedings of the 2022 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp/ISWC '22 Adjunct), September 2022. [DOI, PDF]
- D3. Asha Bhandarkar, **Tan Gemicioglu**, Brahmi Dwivedi, Caitlyn Seim, and Thad Starner. **Learning Piano Songs with Passive Haptic Training: an Interactive Lesson**. Proceedings of the 2022 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp/ISWC '22 Adjunct). September 2022. (Best Demo Award) [DOI, PDF]
- D2. **Tan Gemicioglu**, Noah Teuscher, Brahmi Dwivedi, Soobin Park, Emerson Miller, Celeste Mason, Caitlyn Seim, and Thad Starner. **Passive Haptic Rehearsal for Accelerated Piano Skill Acquisition**. Intelligent Music Interfaces Workshop at CHI Conference on Human Factors in Computing Systems (CHI IMI '22), April 2022. [DOI, PDF]
- D1. Naoki Kimura, **Tan Gemicioglu**, Jonathan Womack, Richard Li, Yuhui Zhao, Abdelkareem Bedri, Alex Olwal, Jun Rekimoto, and Thad Starner. **Mobile, Hands-free, Silent Speech Texting Using SilentSpeller**. Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (CHI EA '21). May 2021. [DOI, PDF]

Patents

- P1. Mike Winters, **Tan Gemicioglu**, Thomas Gable, Yu-Te Wang, Ivan Tashev. **Tongue-Gesture Recognition with Head-Mounted Inertial Measurement Units (IMUs)**. Filed 9/8/2022. Granted 6/25/2024 as US Patent 12,019,808. [URL]

Presentations

Talks

- T2. 10th International BCI Meeting, co-host with Julia Berezutskaya
Machine Learning for Brain-Computer Interfaces Jun 2023
- T1. Microsoft Research, hosted by Ivan Tashev
Tongue Gesture Recognition in Head Mounted Displays Aug 2022

Posters (Non-refereed)

- U6. Transcutaneous Vagus Nerve Stimulation as Momentary Intervention for Modulating Satiety. InterfaceNeuro. May 2025.

- U5. Transitional Gestures for Enhancing ITR and Accuracy in Movement-based BCIs. GT Neuro Student Research Poster Session. April 2023.
- U4. Passive Haptic Rehearsal for Augmented Piano Learning in the Wild. GVU Center Spring Research Showcase. April 2023.
- U3. Neural Mechanisms for Implicit Learning of Motor Skills via Haptic Stimulation. CABI Callosum. April 2023.
- U2. Passive Haptic Rehearsal for Augmented Piano Learning in the Wild. Georgia Tech Career, Research, and Innovation Development Conference. January 2023.
- U1. SilentSpeller: Towards mobile, hands-free, silent speech text entry using electropalatography. GVU Center Spring Research Showcase. April 2022.

Grants and Funding

Contributed to writing and preliminary analyses on following grants:

- Weill Cornell CTSC Pilot Award. Feb 2025
PIs Joan Stilling & Tanzeem Choudhury. Funded \$50,000 for 1 year.
- Sony Research Award, PI Cheng Zhang. Not funded. Sep 2024
- NSF Convergence Accelerator Phase 2, PI Allison Okamura. Not funded. Aug 2023
- Cornell Fellowship. Funded \$70,000 for 1 year. Aug 2023
- CABI Seed Grant, PI Melody Jackson. Not funded. Apr 2023
- New Science Fellowship. Not funded. May 2022

Teaching Experience

Graduate Teaching Assistant – Cornell University Jan 2025 – May 2025
Course: INFO5342 – Designing Ubiquitous and Interactive Computing Devices
50-person graduate course on ubiquitous computing and interactive device design. Gave lectures on Signal Processing & ML on the Edge.

Graduate Teaching Assistant – Cornell University Aug 2024 – Dec 2024
Course: INFO5920 - Specialization Project
52-person primary Master's project course of Cornell Tech. Assisted student projects in health tech and urban tech with brainstorming and prototyping.

Graduate Teaching Assistant – Cornell University Jan 2024 – May 2024
Course: INFO6120 - Ubiquitous Computing
15-person graduate course on ubiquitous computing. Gave lectures, graded assignments and assisted students with prototyping electronics.

OMSCS Teaching Assistant – Georgia Tech Jan 2021 – May 2021
Course: CS6601 - Artificial Intelligence
Created teaching materials for 500 students in Georgia Tech's Online Master's degree program. Wrote an assignment to help students learn how to use Hidden Markov models using HTK and Docker.

Service

Organizer

- Postdoc and Student Committee Chair, BCI Society Aug 2023 – Present
- Futuring SIGCHI Committee Member, ACM SIGCHI Sep 2022 – Sep 2024
- Postdoc and Student Committee Member, BCI Society Jan 2022 – Aug 2023

Associate Chair

CHI 2025 LBW

Reviewer

CHI 2025, 2024; CHI 2024 LBW; IMWUT 2025, 2024, 2023; UbiComp/ISWC 2023; IJHCI 2024

Student Volunteer

UbiComp/ISWC 2023, BCI Meeting 2023, UbiComp/ISWC 2022, IUI 2022

Campus Leadership

- ISGSA IS Seminar Coordinator Jan 2025 – Present
- Vice President, RoboJackets Apr 2021 – Apr 2022
- Project Manager, RoboJackets Apr 2020 – Apr 2021

Mentored Students

PhD Students

- Eden Shaveet – Cornell IS
Cornell IS mentorship program. Aug 2024 - Present

M.S. Students

- Michelle Hui – Cornell Tech IS
At-home ultrasound bone densitometry. March 2025 - Present
- Reitwicz Shandilya – Cornell Tech CS
At-home ultrasound bone densitometry. March 2025 - Present
- Chunhao Zou – Georgia Tech CS (Now at Meta)
Passive haptic rehabilitation app. Jan 2023 - May 2024
- Himanshu Dubara – Georgia Tech ECE (Now at Astera Labs)
Passive haptic learning firmware. Jan 2023 - Aug 2023
- Richa Kulkarni – Georgia Tech CS (Now at Amazon Robotics)
Passive haptic learning hardware. Oct 2022 - Aug 2023

B.S. Students

- Yudong Xie – Tsinghua University ECE
Acoustic sensing for grip force estimation. Feb 2025 - Jul 2025
- Kian Mahmoodi – Cornell ECE & CS
Acoustic sensing for grip force estimation. Feb 2025 - Jul 2025
- Charlie (Chenwei) Zhang – University of Hong Kong CS (Now at Yale)
Acoustic sensing for passive vitals monitoring. Jul 2024 - Nov 2024
- Peter Feng – Georgia Tech CS (Now at Databricks)
Passive haptic learning studies. Mar 2023 - May 2024
- Nathan Eng – Georgia Tech CS (Now at Nike)
Passive haptic learning web app. Jan 2023 - Aug 2023
- Barnabas Li – Georgia Tech CS
Passive haptic learning pedagogy. Jan 2023 - Aug 2023
- Priyanka Rajan – Georgia Tech CS (Now at Apple)
Passive haptic learning and rehabilitation. Aug 2022 - May 2024
- Diego De Dios Suarez – Georgia Tech CS
Passive haptic learning web app. Aug 2022 - Aug 2023

- **Elijah Hopper** – Georgia Tech CS (Now at Databricks) Oct 2021 - May 2024
Passive haptic learning hardware.
- **Emerson Miller** – Georgia Tech CS (Now at Amazon) Oct 2021 - May 2022
Passive haptic learning pedagogy.

Press Coverage

- **MarkTechPost** – [Researchers from Microsoft and Georgia Tech Introduce TongueTap](#) Dec 2023
- **Hackster.io** – [Giving Your Computer a Tongue Lashing](#) May 2022
- **BuzzFeed** – [Smart Retainer Could Let You Text With Your Tongue](#) Jan 2022

Technical Skills

Languages: Python, C, C++, Java, MATLAB, R, Bash, JavaScript, SQL, HTML, \LaTeX

Frameworks: PyTorch, Scikit-Learn, Tensorflow, Kaldi, HTK, ROS, React, Node.js, Android SDK, Unity

Software: Linux, Git, Docker, Maven, Gradle, OpenCV, Gazebo, Microsoft Azure, Doxygen

Prototyping: PCB design, surface mount soldering, 3D printing, laser cutting, KiCAD, Autodesk Fusion

Sensing: Ultrasound, EEG, fNIRS, fMRI, IMU, PPG, LiDAR, capacitance, camera, eye tracking