Tan Gemicioglu

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Research Interests

My research focuses on how we can make healthcare effortless. I design **implicit health interventions** that demand minimal attention and develop **passive sensing technologies** that can measure clinically relevant biosignals. By integrating these approaches, I aim to build closed-loop wearable devices that **monitor and modulate** our health continuously 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, neuromotor rehabilitation, and physiological strain relief. Studying mobile 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.

Oracle Corporate Architecture – Software Engineer Intern May 2020 – Aug 2020

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)

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. *Provisionally accepted.*

C4. **Tan Gemicioglu***, Thalia Viranda*, Yiran Zhao*, Olzhas Yessenbayev, Jatin Arora, Jane Wzng, 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 and Demos (Refereed)

D7. David Martin, Zikang Leng, **Tan Gemicioglu**, Jon Womack, Jocelyn Heath, Bill Neubauer, Hyeokhyen Kwon, Thomas Plötz, 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.

Presentations

Talks

T2. 10th International BCI Meeting, co-host with Julia Berezutskaya — Jun 2023
Machine Learning for Brain-Computer Interfaces

T1. Microsoft Research, hosted by Ivan Tashev — Aug 2022
Tongue Gesture Recognition in Head Mounted Displays

Posters (Non-refereed)

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. 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.

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.

Undergraduate Teaching Assistant – Georgia Tech Jan 2022 – May 2022

Course: CS3001 - Computing and Society

12-person discussion section of ethics course covering privacy, intellectual property and algorithmic bias. Led group discussions and graded written homework.

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 – Present
- Postdoc and Student Committee Member, BCI Society Jan 2022 – Aug 2023

Associate Chair

CHI 2025 LBW

Reviewer

CHI 2025, 2024; CHI 2024 LBW; IMWUT 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) — Aug 2024 - Present
  Cornell IS mentorship program.

M.S. Students

- **Chunhao Zou** (Georgia Tech CS) — Jan 2023 - May 2024
  Passive haptic rehabilitation app.
- **Himanshu Dubara** (Georgia Tech ECE) — Jan 2023 - Aug 2023
  Passive haptic learning firmware.
- **Richa Kulkarni** (Georgia Tech CS) — Oct 2022 - Aug 2023
  Passive haptic learning hardware.

B.S. Students

- **Charlie Zhang** (Cornell Summer Intern) — Jul 2024 - Nov 2024
  Acoustic sensing for passive vitals monitoring.
- **Peter Feng** (Georgia Tech CS) — Mar 2023 - May 2024
  Passive haptic learning studies.
- **Nathan Eng** (Georgia Tech CS) — Jan 2023 - Aug 2023
  Passive haptic learning web app.
- **Barnabas Li** (Georgia Tech CS) — Jan 2023 - Aug 2023
  Passive haptic learning pedagogy.
- **Priyanka Rajan** (Georgia Tech CS) — Aug 2022 - May 2024
  Passive haptic learning and rehabilitation.
- **Diego De Dios Suarez** (Georgia Tech CS) — Aug 2022 - Aug 2023
  Passive haptic learning web app.
- **Elijah Hopper** (Georgia Tech CS) — Oct 2021 - May 2024
  Passive haptic learning hardware.
- **Emerson Miller** (Georgia Tech CS) — 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