Tan Gemicioglu

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Education

Georgia Institute of Technology – Atlanta, GA — Jan 2023 – May 2024

M.S. in Computer Science, Human-Computer Interaction specialization

Georgia Institute of Technology – Atlanta, GA — Aug *2019 – Dec 2022*

B.S. in Computer Science, Intelligence & People concentration, Minor in Physiology — GPA: 3.87 / 4.0

Robert College – Istanbul, Turkey — *Sep 2014 – May 2019*

Research Experience

Georgia Tech Brain Lab – Undergraduate Research Assistant — *May 2021 – Present*

- Developing wearable, non-invasive brain-computer interface using body movement advised by Dr. Melody Jackson
- Aiding the construction of movement-resistant, robust EEG sensors to allow a wider range of BCI functionality

Georgia Tech Contextual Computing Group – Undergraduate Research Assistant — *Jan 2020 – Present*

- Conducting research with wearable computing pioneer Dr. Thad Starner to design smarter, usable wearable interfaces
- Coordinating projects and student groups on HCI research for subtle interactions, physiological sensing and haptics

Northeastern University Center for Robotics – Research Assistant — Jul *2018 – Aug 2018*

- Created control software for Fetch robots with the ROS navigation, localization and mapping packages in Python
- Assisted in speeding up research on deep reinforcement learning using POMDPs for mobile manipulation robots

Bogazici University AILAB – Research Assistant — Jun *2017 – Aug 2017*

- Built and designed robot eyes with animated graphics using Blender, OpenGL and ROS on Raspberry Pi
- Applied HRI research to increase likability of a social robot by generating humanlike facial expressions on LCD display

Industry Experience

Microsoft Research – Research Intern — *May 2022 – Aug 2022*

- Studied tongue gesture recognition, built live multi-gesture random forest classifier for invisible interactions
- Invented new, accessible method of hands-free interaction for mixed reality 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 using Typescript and Oracle JET
- 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 using Docker, Helidon and Knockout
- Designed user help system and fixed UI bugs for REST-based web app launched to 7000+ corporations

Mifos Initiative – Open Source Volunteer — Jan *2017 – May 2019*

- Solved critical bugs impacting customers' daily operations and improved stability in Javascript, Spring, MySQL
- Teamed up with hundreds of volunteers to build frontend, backend of finance platform reaching 20 million clients

Teaching Experience

Computing and Society – Teaching Assistant — *Jan 2022 – May 2022*

- Taught CS3001: Computing and Society, covering privacy, intellectual property and algorithmic bias
- Ran group discussions, graded homework, collaborated with other TAs to advance ethics education in computing

Artificial Intelligence – Teaching Assistant — *Jan 2021 – May 2021*

- Created teaching materials for CS6601: Artificial Intelligence in Georgia Tech's Online Master's degree program
- Wrote an assignment to help students learn how to use and improve Hidden Markov models using HTK and Docker

Projects

BrainBraille — *May 2021 – Present*

- Designing novel brain-computer interface translating muscle tension to language from regional motor activity
- Processing fNIRS signals with machine learning to enable faster communication for people with motor disabilities

Passive Haptic Learning *May 2021 – Present*

- Studying passive learning with vibrotactile haptic feedback gloves for teaching how to play piano with minimal effort
- Designing Bluetooth-enabled haptic gloves and running user studies towards commercialization with NSF support

SilentSpeller *Jan 2020 – Feb 2022*

- Investigated electropalatographic wearable devices as silent speech interfaces using HTK, Sklearn and Bash
- Achieved 97% accuracy using Hidden Markov models and made silent, hands-free text entry system as fast as typing

AI Through Symbiosis *Nov 2020 – May 2021*

- Researched unsupervised object recognition with head-worn displays for AR guidance in warehouse order picking
- Experimented with algorithms across machine learning, computer vision to develop new ML data collection paradigm

Localization of Working Memory using tfMRI *Jul 2021 – Aug 2021*

- Analyzed fMRI time series data from Human Connectome Project with GLMs to locate working memory activity
- Identified brain functional networks, compared activity across stimuli in Neuromatch student collaboration

DJI RoboMaster AI Challenge Dec 2017 – May *2018*

- Optimized path planning and trained LSTM recurrent neural networks controlling autonomous mobile paintball robot
- Ranked finalist among 100 university teams, demonstrated potential of reinforcement learning with custom simulation

Humanitarian Robotics & Automation Technologies Competition Nov 2016 – May *2017*

- Developed decision tree for autonomous landmine detection with metal detectors for robots in Python, Scikit-learn
- Empowered humanitarian demining by improving sensory capabilities of affordable and efficient mobile robots

Publications

Tan Gemicioglu, Mike Winters, Yu-Te Wang, and Ivan Tashev. 2022. Tongue Gestures for Hands-Free Interaction in Head Worn Displays. In Proceedings of the 2022 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp/ISWC '22 Adjunct), September 11–15, 2022, Cambridge, United Kingdom. ACM, New York, NY, USA, 3 pages. https://doi.org/10.1145/3544793.3560363

Asha Bhandarkar, **Tan Gemicioglu**, Brahmi Dwivedi, Caitlyn Seim, and Thad Starner. 2022. Learning Piano Songs with Passive Haptic Training: an Interactive Lesson. In Proceedings of the 2022 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp/ISWC '22 Adjunct), September 11–15, 2022, Cambridge, United Kingdom. ACM, New York, NY, USA, 3 pages. https://doi.org/10.1145/3544793.3560321 **(Best Demo Award)**

Naoki Kimura, **Tan Gemicioglu**, Jonathan Womack, Yuhui Zhao, Richard Li, Abdelkareem Bedri, Zixiong Su, Alex Olwal, Jun Rekimoto, and Thad Starner. 2022. SilentSpeller: Towards mobile, hands-free, silent speech text entry using electropalatography. In *CHI Conference on Human Factors in Computing Systems (CHI '22), April 29-May 5, 2022, New Orleans, LA, USA*. ACM, New York, NY, USA, 19 pages. https://doi.org/10.1145/3491102.3502015

Tan Gemicioglu, Noah Teuscher, Brahmi Dwivedi, Soobin Park, Emerson Miller, Celeste Mason, Caitlyn Seim, and Thad Starner. 2022. Passive Haptic Rehearsal for Accelerated Piano Skill Acquisition. In *Intelligent Music Interfaces Workshop at CHI Conference on Human Factors in Computing Systems (CHI '22), April 29-May 5, 2022*, New Orleans, LA, USA. ACM, New York, NY, USA, 4 pages. https://doi.org/10.48550/arXiv.2203.12749

Naoki Kimura, **Tan Gemicioglu**, Jonathan Womack, Richard Li, Yuhui Zhao, Abdelkareem Bedri, Alex Olwal, Jun Rekimoto, and Thad Starner. 2021. Mobile, Hands-free, Silent Speech Texting Using SilentSpeller. *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, Article 178, 1–5. https://doi.org/10.1145/3411763.3451552

Leadership

ACM SIGCHI

Futuring SIGCHI Committee Member *Sep 2022 – Present*

- Advancing new community visions in SIGCHI to make the organization more open and accessible beyond academia
- Building organizational infrastructure to facilitate communication and co-mentorship across students in HCI

Student Volunteer

- Assisted academic conference organization at IUI 2022 virtually and at ISWC/UbiComp 2022 in-person
- Served in diverse roles including AV support, managing online platforms and scheduling for sessions chairs

BCI Society – Postdoc and Student Committee Member *Jan 2022 – Present*

- Running student networking initiatives as part of organizing committee supporting the international BCI Meeting
- Arranging workshops on topics enabling BCI development to equalize knowledge across BCI researchers globally

RoboJackets

Vice President *Apr 2021 – Apr 2022*

- Directed GT's premier robotics organization consisting of 400 students competing in 7 global competitions
- Created sustainable knowledge repository and ensured communication across core leaders, alumni and teams

Project Manager *Apr 2020 – Apr 2021*

- Led multidisciplinary team of 60+ students in building robot to autonomously navigate open grassy terrain
- Organized team through the pandemic, managed a $10,000 budget and pioneered plan for new competition

Honors and Awards

UbiComp/ISWC 2022 Best Demo Award	Sep 2022
UROP Undergraduate Research Symposium 2nd Place Oral Presentation Award	Apr 2022
Georgia Tech President's Undergraduate Research Travel Award	Mar 2022
Georgia Tech President's Undergraduate Research Salary Award	*Aug 2021*
UROP Undergraduate Research Symposium 1st Place Oral Presentation Award	*Apr 2021*
Sait Halman Award for Excellence in Computer Science	*Jun 2019*
Bronze Medal in the Turkish National Olympiad in Informatics	*Nov 2018*
ICRA 2018 DJI RoboMasters AI Challenge Finalist	May 2018
ICRA 2017 Humanitarian Robotics & Automation Technologies Competition Finalist	May 2017
Google Code-in Finalist for the Mifos Initiative	*Feb 2016*
Google Code-in Finalist for RTEMS	*Feb 2015*

Skills

Languages: Python, C, C++, Java, MATLAB, R, Bash, JavaScript, SQL, HTML, LaTeX
Frameworks: Pytorch, Sklearn, Tensorflow, Kaldi, HTK, ROS, Spring, 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 Inventor
Sensing: EEG, fNIRS, fMRI, IMU, PPG, LiDAR, capacitance, camera, eye tracking