

Tan Gemicioglu

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Education

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

Microsoft Research – Research Intern

May 2022 – Aug 2022

- Studied tongue gesture recognition, collected 50,000 gesture dataset and built machine learning classifier
- Pioneered new, accessible method of hands-free interaction for mixed reality devices with multimodal sensing

Georgia Tech Brain Lab – Undergraduate Research Assistant

May 2021 – Present

- Developing fast, 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

- Working with wearable computing pioneer Dr. Thad Starner to design smarter, usable wearable interfaces
- Coordinating projects between students and industry on HCI research for subtle communication and haptics

Northeastern University Center for Robotics – Research Assistant

Jul 2018 – Aug 2018

- Created interfaces 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 manipulators

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

Industry Experience

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, improved stability in Javascript, Spring, MySQL
- Teamed up with hundreds of volunteers on frontend, backend of finance platform reaching 20 million clients

Teaching Experience

Computing and Society (Georgia Tech) – Teaching Assistant

Jan 2022 – May 2022

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

Artificial Intelligence (Georgia Tech) – Teaching Assistant

Jan 2021 – May 2021

- Created content 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

Projects

BrainBraille

May 2021 – Present

- Designing a novel brain-computer interface translating muscle tension to language from local motor activity
- Processing fNIRS signals with machine learning to enable 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 the piano
- Designing hardware for wireless wearable haptic glove, user-facing website and organizing user studies

SilentSpeller

Jan 2020 – Feb 2022

- Investigated electropalatographic wearable devices as silent speech interfaces using HTK, Sklearn and Bash
- Achieved 97% accuracy using NLP techniques 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 augmented reality applications
- Experimented with algorithms across machine learning, computer vision to develop new ML dataset paradigm

Localization of Working Memory using fMRI

Jul 2021 – Aug 2021

- Analyzed fMRI time series data from Human Connectome Project with GLMs to find 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 for an autonomous mobile robot
- Competed with 100 teams, demonstrated potential of reinforcement learning with a custom simulation

Humanitarian Robotics & Automation Technologies Competition

Nov 2016 – May 2017

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

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 for 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

BCI Society – Postdoc and Student Committee Member

Jan 2022 – Present

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

ACM SIGCHI – 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

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

FIRST Robotics Competition, ARC 6014 – Vice Captain and Software Lead

Sep 2016 – May 2019

- Won 6 awards internationally, qualified for championships twice by coordinating team of 30 students
- Taught new members how to code and created software workflows in Java using Git and Gradle

Honors and Awards

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

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