CEM OKAN YALDIZ

⌂ encoy.github.io • in • GitHub • ℐ • ☏ +14706674291 • ✉ cyaldiz3@gatech.edu

EDUCATION

Georgia Institute of Technology • Atlanta/GA   August 2021 – Expected Fall 2025
PhD in Robotics • *Electrical and Computer Engineering* • CGPA: 4.0/4.0
Master of Science • *Computer Science* • *Computational Perception and Robotics* • Expected Fall 2024
Advisor: Omer Inan
Interest: Applied Machine/Deep Learning, Time Series, Data-Driven Decision-Making, Sensors

Bilkent University • Ankara   August 2016 – June 2021
Bachelor of Science • *Electrical and Electronics Engineering* • *CGPA: 3.94/4.0*

EXPERIENCE

Graduate Research Assistant – Inan Research Lab   August 2021 – Present
Georgia Institute of Technology, Atlanta

- Developed a deep learning model for early prediction of exertional heat stroke (EHS) using wearable data. Achieved 52± 18 minutes in advance prediction capability.
- Developed a reliable calibration approach for magnetic localization to preserve sub-millimeter accuracy. The approach significantly reduces the degree of localization model's post-deployment distribution shift.
- Developed Kalman filter-based real-time physiological feature predictors with sub-millisecond accuracy.
- Currently working on representation learning approaches (e.g., self-supervised learning, contrastive learning, multi-modal data fusion etc.) on physiological signals (e.g., ECG, SCG, PPG etc.) for decision-making systems.

Undergraduate Research Assistant – Systems Lab   February 2019 – August 2021
Bilkent University, Ankara

- Developed more realistic behavioral human driver models for improving simulation of traffic scenarios including both autonomous cars and human drivers.

PUBLICATIONS

- **C.O. Yaldiz** et al., "Autoregressive Prediction of Cardiac Features", *manuscript in preparation*, 2024.
- **C.O. Yaldiz** et al., "Early prediction of impending exertional heat stroke with wearable multimodal sensing and anomaly detection", *IEEE Journal of Biomedical and Health Informatics*, 2023.
- **C.O. Yaldiz**, N. Sebkhi, A. Bhavsar, J. Wang, O.T. Inan, "Improving Reliability of Magnetic Localization Using Input Space Transformation", *IEEE Sensors Journal*, 2023.
- **C.O. Yaldiz**, Y. Yildiz, "Driver Modeling Using a Continuous Policy Space: Theory and Traffic Data Validation", *IEEE Transactions on Intelligent Vehicles*, 2023, in press.
- D.J. Lin, A. Satish, K.L. Richardson, S. An, **C.O. Yaldiz**, M. Buller, K. Driver, E. Atkinson, T. Mesite, C.King, O.T. Inan, A. Medda, "Predicting Soldier Performance on Structured Military Training Marches with Wearable Accelerometer and Physiological Data", *IEEE Sensors Journal*, 2023.
- **C.O. Yaldiz**, Y. Yildiz, "Driver Modeling Using Continuous Reasoning Levels: A Game Theoretical Approach," *2022 IEEE 61st Conference on Decision and Control (CDC)*, Cancun, Mexico, 2022, pp. 5068-5073, doi: 10.1109/CDC51059.2022.9992839.

SERVICE

- **Reviewer**: IEEE Journal of Biomedical and Health Informatics - 2024
- **Reviewer**: IEEE Conference on Decision and Control - 2024

SKILLS

- **Technical**: Machine Learning, Deep Learning, Data Science, Time Series Forecasting, Anomaly Detection, Computer Vision, Reinforcement Learning, Biosensors, Physiological Sensing and Computing, Motion Tracking, Human Activity Recognition, Multi-Modal Fusion, State Space Modeling
- **Programming**: Python, MATLAB, C++, Pytorch, Pytorch Lightning, Hugging Face, Wandb
- **Tools**: Microsoft Office, Inkscape, LaTeX, Git
- **Languages**: Turkish (Native), English (Fluent)

Honors & Awards

- **Georgia Institute of Technology ECE Fellowship (2022)**: Received a stipend for the first year of study.
- **Bilkent University EEE Graduation Awards (2021)**: Granted for academic excellence.
- **TUBITAK Star Undergraduate Research Award (2021)**: Received monthly stipend during a research project on the subject of behavioral human driver modeling.
- **Turkish Education Foundation (TEV) Outstanding Success Scholarship (2017-2021)**: Granted for leadership skills and received a scholarship during undergraduate education.
- **Bilkent University Comprehensive Scholarship (2016-2021)**: Received full tuition waiver and stipend during the B.Sc program due to high ranking in nationwide university entrance exam.

Projects

- **Physiological Feature Forecasting** - Research Project - Georgia Tech

  Developed algorithms to predict aortic opening and closing time features. The project aimed at real-time forecasting capabilities with low latency and high robustness to noise.

- **Physiological Signal Quality Indexing** - Research Project - Georgia Tech

  Currently working on data-driven methods for improving existing signal quality indexing for SCG and PPG signals. The project aims at correctly estimating the quality of physiological signals to discard the data with low quality to improve predictive models.

- **Disentangled Representation Learning For HAR** - Research Project - Georgia Tech

  Worked on self-supervised disentangled representation learning mechanism to improve wearable sensor-based human activity recognition. The project aimed at obtaining more interpretable, generalizable and controllable representations.

- **MagTrack** - Research Project - Georgia Tech

  Developed a new calibration method for mitigating post-deployment distribution shift issue. The project aimed at tracking tongue motion for wearable articulography through magnetic localization. Currently improving already developed magnetic calibration approach to make it more practical for the end user.

- **Early EHS Prediction** - Research Project - Georgia Tech

  Developed a deep learning model for early prediction of exertional heat stroke. The project aimed at preventing soldiers from having heat stroke during rucksack march. The data consisted of accelerometry traces and heart rate information of ~ 500 soldiers marching on an army terrain. Reached early warning capabilities with correct predictions at 60% of the march. Currently designing an end-to-end framework to completely eliminate the need for feature extraction.

- **Game Theoretical Human Driver Modeling** - Research Project - Bilkent University

  Developed a new game theoretical framework for human driver modeling by extending level-k reasoning concept. Introduced a continuous level-k reasoning concept by employing Gaussian Processes.

- **6D Pose Estimation** - Course Project - Georgia Tech

  Developed a deep learning model for 6D pose estimation using point cloud datasets. The approach relied on a fusion of information coming from different granularities to make a global prediction.

- **Low Dimensional Model for EEG-Based Emotion Processing** - Course Project - Georgia Tech

  Investigated a low-dimensional model of emotion processing in the brain, with the goal of evaluating the plausibility of the circumplex model of affect.

- **Detecting Damages on Car Bodies** - Graduation Project - Bilkent University

  Developed a method for detecting dents and bumps on car bodies by comparing RGBD images (i.e., point clouds) of cars before and after the damage.

- **Automated Trading Using Reinforcement Learning** - Internship Project

  Developed an automated trading agent on FOREX market simulation that used Deep Q-Learning.

- **Trading System Development and Portfolio Optimization** - Course Project - Bilkent University

  Developed a system that collects real-time stock data using an API, and makes decisions based on several online decision making algorithms, incorporating Kelly Criterion-based portfolio optimization.