Emre Kurtoğlu

New York, NY ekurtoglu@rockefeller.edu +1 205 534 8630
ekurtgl.github.io Google Scholar ekurtgl

Summary

Machine learning (ML) researcher with background focused on signal processing, computer vision, and deep learning. Have 6+ years of experience with end-to-end ML life-cycle including experiment design, real-world dataset curation, preprocessing, deep learning model architecture design, training, evaluation, and deployment. Also worked with signal processing and ML applications of various sensors including FMCW radars, RGB-D/IR cameras, ECG, and iEEG.

Education

The University of Alabama *May 2024*
Ph.D. in Electrical and Computer Engineering. Advisor: Sevgi Zübeyde Gürbüz

Koç University *Aug 2018*
B.Sc. in Electrical and Electronics Engineering. Advisor: Sinem Çöleri Ergen

Experience

Machine Learning Engineer II *New York, NY*
The Rockefeller University, Data Science Platform *July 2024 – Present*

- Neural drift learning in multi-electrode arrays across days via contrastive learning. [Project]
- Contactless respiration and heart beat monitoring using FMCW radar. [Project]
- Synchronous data acquisition with Basler and FLIR cameras. [Code]

Machine Learning Engineer Intern *San Jose, CA*
NXP Semiconductors *May 2023 – Aug 2023*

- Neural Architecture Search (NAS) on the radar point cloud classification model.
- Automotive sensor (Radar & Camera) data visualization via AVS.
- *Mentor: Satish Ravindran, Manager: Ryan Wu.*

Machine Learning Engineer Intern *Remote*
Google Summer of Code - ML4SCI *May 2021 – Aug 2021*

- Graph neural networks for particle momentum estimation in the CMS trigger system. [Article, Code]
- *Mentor: Sergei Gleyzer.*

Military Computer Design Engineering Intern *Ankara, Turkey*
Aselsan *June 2018 – July 2018*

- Embedded systems programming in C with the peripherals of PIC32MX including ADC, Timer, Oscillator, UART, I2C and Flash.
- *Mentor: Fatih Say.*

Production Intern *Istanbul, Turkey*
Acrome Robotics *Feb 2018 – Mar 2018*

- Assembled robotics' parts (e.g., Delta Robot, Ball Balancing Table) which are used in lab lectures and calibrated the final products.

Process Solutions Intern *Istanbul, Turkey*
Honeywell *Aug 2017 – Sep 2017*

- Designed operator panels of distributed control systems.

Ph.D. Research

- Human-centric multi-state radar with machine learning. [Paper]
- Sign language-controlled Chess game with synchronous multi-modal (Video + Radar) data acquisition and ML prediction. [Paper]
- Graph neural networks for human activity recognition.
- Deep neural network design for American Sign Language (ASL) recognition with radar.
- Multi-input multi-task learning network design for multiple data representations. [Paper]
- Automated temporal segmentation and sequential classification of radar data. [Paper]
- Real-time processing and classification of radar data.
- Extraction of range, Doppler and angle-of-arrival information from raw I/Q radar data and point cloud generation.
- Multi-modal fusion network design for video and RF data classification.
- FMCW MIMO radar simulation for point targets. [Code]
- Graphical User Interface (GUI) design for synchronous data acquisition from multiple sensors (radar, lidar, camera). [Code]
- Experiment design and raw data acquisition with FMCW MIMO radars (TI's IWR1443, AWR1642, AWR2243 single and cascade chips, Infineon's BGT60TR13C, XeThru X4) and RGB-D sensors including (Kinect v2, Orbbec, Basler, FLIR).

Honors

- Best Student Paper Competition Finalist (IEEE Radar Conf. 2024) – Denver, CO.
- Best Student Paper Competition Finalist-Alternate (IEEE Radar Conf. 2022) - New York, NY.
- University of Alabama Graduate Council Fellowship, 2021.

Invited Talks

- University College London (UCL) - Radar Group, 2024.

Publications

Journals

- Emre Kurtoğlu and Sevgi Z. Gurbuz, **"Human-Centered Fully-Adaptive Radar for Gesture Recognition in Smart Environments,"** in IEEE Transactions on Human-Machine Systems, 2025.
- Emre Kurtoglu, Kenneth DeHaan, Caroline Kobek Pezzarossi, Darrin J. Griffin, Chris Crawford, and Sevgi Z. Gurbuz, **"Interactive Learning of Natural Sign Language with Radar"** in IET Radar, Sonar & Navigation, 2024.
- Emre Kurtoglu, Sabyasachi Biswas, AC. Gurbuz and Sevgi Z. Gurbuz, **"Boosting multi-target recognition performance with multi-input multi-output radar-based angular subspace projection and multi-view deep neural network"** in IET Radar, Sonar & Navigation, 2023.
- Evie A. Malaia, Joshua D. Borneman, Emre Kurtoglu, Sevgi Z. Gurbuz, Darrin Griffin, Chris Crawford, and Ali C. Gurbuz. **"Complexity in sign languages"**. Linguistics Vanguard, 9(s1):121–131, 2023.
- Sevgi Z. Gurbuz, Emre Kurtoglu, M. Mahbubur Rahman, Dario Martelli, **"Gait variability analysis using continuous RF data streams of human activity"** in Smart Health, Volume 26, 2022.
- Emre Kurtoglu, AC. Gurbuz, Evie Malaia, Darrin Griffin, Chris Crawford, and Sevgi Z. Gurbuz, **"ASL Trigger Recognition in Mixed Activity/Signing Sequences for RF Sensor-Based User Interfaces,"** in IEEE Transactions on Human-Machine Systems, 2021.
- SZ. Gurbuz, MM. Rahman, E. Kurtoglu, et al., **"Multi-Frequency RF Sensor Fusion for Word-Level Fluent ASL Recognition,"** in IEEE Sensors Journal.
- SZ. Gurbuz, AC. Gurbuz, EA. Malaia, DJ. Griffin, C. Crawford, E. Kurtoglu, et al., **"American Sign Language Recognition Using RF Sensing,"** in IEEE Sensors Journal.

Conference Proceedings

- Kenneth DeHaan, Emre Kurtoğlu et al., **"RF-ChessSIGN: Radar-enabled Human-Computer Interaction in a Real-Time Sign Language-Controlled Game,"** Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops, 2025, pp. 4941-4951.
- Sevgi Z. Gurbuz and Emre Kurtoğlu, **"Gesture-based Human-in-the-Loop Interaction with Fully-Adaptive Radar,"** IEEE International Radar Conference (RADAR), 2025, pp. 1-6.
- Emre Kurtoğlu, et al. **"Ethogram-Based Personalization of Human Activity and Agility from Radar μD Signatures."** 2024 IEEE EMBS International Conference on Biomedical and Health Informatics (BHI), 2024.
- E. Kurtoğlu, M. G. Amin and S. Z. Gurbuz, **"Radar Based Joint Human Activity and Agility Recognition via Multi Input Multi-Task Learning,"** 2024 IEEE Radar Conference (RadarConf24), Denver, CO, USA, 2024, pp. 1-6. *(Runner Up Award)*
- Emre Kurtoğlu, Sultanus Salehin, Moeness G. Amin, Sevgi Z. Gurbuz, **"RF sensing of personalized mobility: accounting for temporal variability in ethogram-based classification,"** Proc. SPIE 13048, Radar Sensor Technology XXVIII, 130480Q (2024).
- Sevgi Z. Gurbuz, Emre Kurtoglu, et al., **"Interactive rf game design for deciphering real-world human motion: Activities, gestures, and sign language"**. In 2023 IEEE Radar Conference (RadarConf23), pages 1–6, 2023.
- Sevgi Z. Gurbuz, M. Mahbubur Rahman, E. Kurtoglu, and Dario Martelli. **"Continuous human activity recognition and step-time variability analysis with FMCW radar"**. In 2022 IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI), pages 01–04, 2022.
- Emin Ucer, E. Kurtoglu, et al., **"Local detection of oltc operation to support decentralized control of active end-nodes"**. In 2022 IEEE Power & Energy Society General Meeting (PESGM), pages 1–5, 2022.
- E. Kurtoğlu, et al., **"RF Micro-Doppler Classification with Multiple Spectrograms from Angular Subspace Projections,"** in IEEE Radar Conference (RadarConf22), 2022, pp. 1-6. *(Best student paper finalist - alternate)*
- S. Z. Gurbuz, E. Kurtoglu et al., **"ASL Recognition Based on Kinematics Derived from a Multi-Frequency RF Sensor Network,"** in IEEE SENSORS, 2020, pp. 1-4.
- M. M. Rahman, E. Kurtoglu et al., **"Performance Comparison of Radar and Video for American Sign Language Recognition,"** in IEEE Radar Conference (RadarConf22), 2022, pp. 1-6.
- Oladipupo O. Adeoluwa, Sean J. Kearney, Emre Kurtoglu, Charles J. Connors, and Sevgi Z. Gurbuz **"Near real-time ASL recognition using a millimeter wave radar"**, Proc. SPIE 11742, Radar Sensor Technology XXV, 1174218 (2021).
- M. Mahbubur Rahman, E. Kurtoglu, R. Mdrafi, A.C. Gurbuz, E. Malaia, C. Crawford, D. Griffin, S.Z. Gurbuz, **"Word-level ASL Recognition and Trigger Sign Detection with RF Sensors"**, in Proc. IEEE ICASSP, 2021.
- E. Kurtoglu, AC. Gurbuz, EA. Malaia, DJ. Griffin, C. Crawford, SZ. Gurbuz, **"Sequential Classification of ASL Signs in the Context of Daily Living Using RF Sensing"**, in IEEE Radar Conference, 2021.
- SZ. Gurbuz, AC. Gurbuz, EA. Malaia, DJ. Griffin, C. Crawford, E. Kurtoglu, et al., **"ASL Recognition Based on Kinematics Derived from a Multi-Frequency RF Sensor Network"**, in IEEE Sensors Conference, 2021.
- SZ. Gurbuz, MM. Rahman, TF. Macks, E. Kurtoglu, **"Cross Frequency Training with Adversarial Learning for Radar micro-Doppler Signature Classification"**, in Proc. SPIE, Defense + Commercial Sensing Symposium, 2020.
- SZ. Gurbuz, AC. Gurbuz, EA. Malaia, DJ. Griffin, E. Kurtoglu, et.al. **"A Linguistic Perspective on Radar Micro-Doppler Analysis of American Sign Language"**, IEEE Radar Conference, 2020.

Technical Skills

- **Programming:** MATLAB, Python (TensorFlow, NumPy, PyTorch, LLM and database APIs, FastAPI).
- **Computing and Cloud:** Linux, CUDA, Cluster Computing, GCP, AWS (EC2, S3).