

AYBERK YARKIN YILDIZ

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Education

Northeastern University, Boston, MA, USA

Fall 2023 – Spring 2028

Doctor of Philosophy in Electrical and Computer Engineering

CGPA: 3.84/4.00

- Courses: Advanced Machine Learning, Probabilistic System Modeling, Machine Learning with Small Data, Introduction to Machine Learning and Pattern Recognition, Data Visualization, Parallel Processing for Data Analytics, Applied Probability and Stochastic Processes, Fundamentals of Computer Engineering

Bilkent University, Ankara, Turkey

Fall 2018 – Spring 2023

Bachelor of Science in Electrical and Electronics Engineering

CGPA: 3.38/4.00

- Courses: Digital Signal Processing, Telecommunications, Neural Networks, Electronic Circuit Design, Feedback Control Systems, Microprocessors, Probability and Statistics, Engineering Electromagnetics, Signals and Systems, Analog Electronics, Engineering Mathematics I-II, Digital Design, Circuit Theory, Introduction to Programming in Python, Engineering Economic Analysis

Friedrich-Alexander-Universität, Erlangen, Germany

Spring 2022

Erasmus Student in Elektrotechnik – Elektronik und Informationstechnik

- Courses: Deep Learning, Machine Learning for Engineers, Optimization for Engineers, Cognitive Neuroscience for AI Developers

Mehmet Emin Resulzade High School, Ankara, Turkey

Fall 2014 – Spring 2028

- CGPA: 98/100. Attended Nesibe Aydın High School for the last year.

Skills

Programming: Python (PyTorch, Keras, PySpark), C/C++

Languages: English (Fluent – C1 level), Turkish (Native Fluency), German (Beginner – A2 level)

Research and Work Experience

Northeastern University

Boston, MA, USA

Graduate Research Assistant

Fall 2023 – Spring 2028

- Research Labs: DNAL, WIoT, SPIRAL

Neurocess Limited

London, England

Data Science / Machine Learning Engineer (Remote)

Fall 2022 – Summer 2023

- Analyzed data from active sEMG sensors designed for monitoring athletic and physiologic performance of football players using Siamese networks with transformers for multivariate time-series implemented in PyTorch and Keras.

KOCLAB, National Magnetic Resonance Research Center (UMRAM)

Ankara, Turkey

Undergraduate Researcher

Fall 2021 – Fall 2022

- Conducted deep learning research on implementation and technical extensions of time-series analysis and imputation using RNNs and Transformer models in PyTorch.

Bilkent University

Ankara, Turkey

Teaching Assistant

Spring 2020 – Fall 2021

- Tutored students and graded assignments for Calculus I, Calculus II for 60 students per semester.

TUBITAK SAGE

Ankara, Turkey

Intern

Summer 2021


- Used Altium Designer to implement and design the software and hardware simulations of nano-drones to improve agility and reduce visibility for military applications.

UMRAM

Ankara, Turkey

Intern

Summer 2020

- Implemented and tested the interfaces of the fundamental electronic devices such as a gaussmeter, an analog filter, and a DC power supply in MATLAB for the company's future research. Led to a publication in Medical Physics. 

Projects

Communication-aware neural Mapping and Pruning framework

Spring 2024 – Spring 2025

- Performed efficient distributed inference over communication-aware mapped and pruned convolutional neural networks using PyTorch. Tested on real-life environments such as Colosseum wireless emulator in wired, wireless, and cellular scenarios, and Raspberry Pi's. Observed up to a 26× speedup over pruned models.

Markovian Experimental Design under Concept Drift

Spring 2024 – Spring 2025

- Implemented a markovian experimental design framework under concept model drift scenarios via Kalman filters in Python.

Gradient Boosting Decision Trees on Medical Diagnosis [View publication \[1\]](#) [🔗](#)

Fall 2024

- Implemented an extensive analysis of ensemble models in medical diagnosis focusing on the superior performance over state-of-the-art deep learning models in PyTorch.

Wireless Radar Classification with Transformers [View preprint](#) [🔗](#)

Fall 2023 – Spring 2024

- Implemented transformer-based classification models for wireless radar signals over out-of-distribution data with LoRA and conformal prediction in PyTorch.

Portable RF Signal Sensing System Using SDR [View publication \[2\]](#) [🔗](#)

Fall 2023

- Implemented an Electronic Support Measures (ESM) system with a GPU accelerated SDR that could detect, measure, and classify RF signals using signal processing algorithms in GNU Radio and XGBoost. Designed the system as compact and portable contrary to the current ESM products.

Genetic Algorithms for Feature Selection [View preprint](#) [🔗](#)

Fall 2023

- Major contribution in parallelization of several genetic algorithms for feature selection to enable concurrent training of ML models on diverse feature subsets in PySpark and JobLib.

sEMG Motion Classification and Anomaly Detection [View preprint](#) [🔗](#)

Fall 2022 – Fall 2023

- Implemented motion classification and anomaly detection models using sEMG signals via few-shot learning with a Siamese network in Keras and PyTorch.

Multivariate Time Series Imputation With Transformers [View publication \[3\]](#) [🔗](#)

Fall 2022

- Developed a transformer-based autoencoder for missing value imputation that outperformed seven state-of-the-art imputation methods by 13.5 – 50.5% over benchmark datasets.

Publications

- [1] **A. Y. Yıldız**, A. Kalayci, “Gradient boosting decision trees on medical diagnosis over tabular data.” arXiv preprint arXiv:2410.03705 (2024). (accepted to IEEE International Conference on AI and Data Analytics, 2025)
- [2] G. S. Yavuz, B. Saygılı, Y. Aydın, R. Dalkıran, İ. Eşin, M. Uluçay, B. Uykulu, S. S. Kıyma, O. Arikan, and **A. Y. Yıldız**, “Detection and classification architecture for sdr based radar electronic support measure systems.” 2024 32nd Signal Processing and Communications Applications Conference (SIU). IEEE, 2024.
- [3] **A. Y. Yıldız**, E. Koç, and A. Koç. “Multivariate time series imputation with transformers.” IEEE Signal Processing Letters 29 (2022): 2517-2521.

Honors & Awards & Certificates

- Invited Talks
 - IEEE Signal Processing Society Blog 2024
 - IEEE International Conference on Image Processing 2023
- Research Excellence Award at Bilkent University 2023
- High Honor Student & Tuition Scholarship at Bilkent University 2018 – 2023
- 8/8th grade practical and theoretical performance certificate for piano February 2023
 - Examiner: Associated Board of the Royal School of Music (ABRSM), London, UK
- Ranked as 1914 out of 2.5 million students in university entrance exam July 2018

Extracurricular Activities & Memberships

- Amazon IET-MSI Program Participant Fall 2024
- Northeastern University SPIRAL Committee Member Fall 2024
 - Organized three seminars with participants from Northeastern University and Boston University, MA, USA; and École Polytechnique Fédérale de Lausanne, Switzerland.
- Bilkent Community Awareness Projects Spring 2021
- Competitive piano player, passed ABRSM practical performance exams. 2007 – Present
- Competitive basketball player, medaled in several local tournaments. 2008 – 2017