AYBERK YARKIN YILDIZ

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EDUCATION

Northeastern University, Boston, MA, USA **Fall 2023 – Expected 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 2018**

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

SKILLS

Programming

- Advanced: Python (PyTorch, Tensorflow, Keras, Numpy, SciPy, Scikit-learn, Pandas, Matplotlib, PySpark), Git, Linux, LATEX, AWS, MATLAB, VSCode, PyCharm, LTSpice, Altium Designer, DipTrace, Object-Oriented Programming
- Intermediate: C/C++, Assembly, VHDL, Xilinx Design Suite, MCU Design Suite

Languages

- English (Fluent – C1 level), Turkish (Native Fluency), German (Beginner – A2 level)
  - TOEFL IBT: 94/120
  - GOETHE-ZERTIFIKAT-A2: 52/80

RESEARCH AND WORK EXPERIENCE

Northeastern University, Boston, MA, USA **Fall 2023 – Expected Spring 2028**
Graduate Research Assistant
Research Labs: DNAL, WIoT, SPIRAL

- Implemented transformer-based classification models for wireless radar signals over out-of-distribution data with LoRA and conformal prediction using PyTorch.
- Performed efficient distributed inference over communication-aware pruned convolutional neural networks using PyTorch. Tested on real-life environments such as Colosseum wireless emulator. Observed up to a ×96.6 speedup over pruned models in wired, wireless, and cellular scenarios.
- Implemented markovian experimental design methodologies in data drift scenarios via Kalman filters in Python.

Neurocess Limited, London, England **Fall 2022 – Summer 2023**
Data Science / Machine Learning Engineer (Remote)

- Analyzed data from active EMG 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 **Fall 2021 – Fall 2022**
Undergraduate Researcher

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

Bilkent University, Ankara, Turkey **Spring 2020 – Fall 2021**
Teaching Assistant

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

TUBITAK SAGE, Ankara, Turkey **Summer 2021**

Intern

- 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 **Summer 2020**

Intern

- Implemented and tested the interfaces of the fundamental electronic devices such as a gaussmeter, an analog filter, a temperature sensor, and a DC power supply in MATLAB for the company's future research
- This work led to the publication: M. Utkur and E. U. Saritas, "Simultaneous temperature and viscosity estimation capability via magnetic nanoparticle relaxation," Medical Physics, 2022.

PROJECTS

Gradient Boosting Decision Trees on Medical Diagnosis **Fall 2024**

- Major contribution in an extensive analysis of ensemble models in medical diagnosis focusing on the superior performance over state-of-the-art deep learning models. Implemented in PyTorch. *(arXiv preprint arXiv:2410.03705)*

Genetic Algorithms for Feature Selection **Fall 2023**

- Major contribution in parallelization of several genetic algorithms for feature selection to enable concurrent training of ML models on diverse feature subsets. Implemented in PySpark and JobLib. *(arXiv preprint arXiv:2401.10846)*

Portable RF Signal Sensing System Using GPU Accelerated Software Define Radio (SDR) **Fall 2022 – Spring 2023**

- Major contribution in the implementation of an Electronic Support Measures (ESM) system with a Software-Defined Radio (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.

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 2018**
  - 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**

PUBLICATIONS

- **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)
- G. S. Yavuz, B. Saygılı, Y Aydınlı, 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)*, pp. 1-4. IEEE, 2024.
- **A. Y. Yıldız**, E. Koç and A. Koç, "Multivariate Time Series Imputation With Transformers," in IEEE Signal Processing Letters, vol. 29, pp. 2517-2521, 2022.

HOBBIES

- Competitive piano player, passed ABRSM practical performance exams. **2007 – Present**
- Competitive basketball player, medaled in several local tournaments. **2008 – 2017**