# Ayşin Tümay

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## Education

**Ankara Atatürk Anatolian Highschool** **Sep. 2015 – Jun 2019**
*Science/Maths student* *Ankara, Turkey*

- Graduation Grade: 97.38/100
- Diploma Grade: 512.43/560

**Bilkent University** **Sep. 2019 – May 2024**
*Bachelor of Science in Electrical and Electronics Engineering* *Ankara, Turkey*

- **GPA:** 3.81/4.00
- Ranked 9 out of 158 students.

## Research Interests

- Machine Learning
- Data Science
- Convex Optimization
- Signal Processing

## Relevant Coursework

- CS 464 Introduction to Machine Learning
- EEE 485 Statistical Learning and Data Analytics
- EEE 424 Digital Signal Processing
- EEE 392 Individual Research Study
- EEE 486 Statistical Foundations of Natural Language Processing
- EEE 431 Digital Communications
- ECON 439 Game Theory I

## Experience

**UMRAM, Bilkent University** **August 2021**
*Undergraduate Research Assistant* *Ankara, Turkey*

- Practiced Deep Learning methods for detecting brain illnesses in MRI scans.

**ASELSAN, Radar and Warfare Systems** **Jun 2022 – July 2022**
*Algorithm Design Intern* *Ankara, Turkey*

- Practiced different tools and methods for geolocation detection of radars using warfare systems in MATLAB.

**DataBoss Security and Analytics** **August 2022 – Sep. 2022**
*Machine Learning Intern* *Ankara, Turkey*

- Practiced Machine Learning techniques on time series data using Gradient Boosting and Neural Network models with Python.

**DataBoss Security and Analytics** **December 2022 – Present**
*Machine Learning Researcher* *Ankara, Turkey*

- Working on sequential data to build state-of-the-art Machine Learning algorithms.
- Developing novel methods to overcome the curse of dimensionality in high dimensional feature spaces with Gradient Boosting algorithms.

## Projects

**Digital FPGA Piano for Beginners** | *VHDL, BASYS3* **February - May 2021**

- Designed a digital piano which outputs notes of 8 octaves from a buzzer based on timer frequency, and the piano image in a VGA screen.

**Analog Multiplier** | *BJT, LTSpice, DipTrace* **February - May 2022**

- Designed an analog multiplier with 6 BJTs by simulating it in LTSpice and designing the PCB in DipTrace.

**Magnetically Levitated Lamp** **September - December 2022**

- Designed a levitated lamp by constructing 3 magnetic loops for lighting, levitating and magnetization.

**Image Reconstruction** | *MATLAB* **December 2022**

- Reconstructed an image from its basis element with FFT.

**Song Recommendation System for Spotify Playlists** | *Python, TensorFlow* **September - December 2022**

- Used Spotify API to extract the musical properties of songs and playlists.
- Trained unsupervised clustering algorithms such as k-Means, DBScan, and Autoencoder to give several song recommendations to a playlist.

**A Basic Level Category Analysis with Commonsense Question Answering** **February - May 2023**

- Measured the common sense question answering performance of one of the GPT language models, GPT-3.5-turbo, by integrating a well-known language game, Family Feud.
- Analyzed basic level category words based on the Family Feud dataset.

**Wind Energy Production Prediction** **February - May 2023**

- Designed a system to predict hourly total electrical energy consumption in Spain with Linear Regression, Decision Tree, and AdaBoost.
- The models are designed without any built-in library support of Python.

**Spatiotemporal Traffic Accident Prediction in Turkey** **June 2023- Present**

- Designing machine learning models to predict the probability of traffic accidents with NN and Boosting methods for each grid location.
- Conducting research on tackling data sparsity and spatial heterogeneity.

## Achievements

$5^{th}$ **Place at Invent Analytics Data Analysis Challange** | *Jupyter* **September 2022**

- Trained and tested a Machine Learning model to forecast the sales amount of a clothing brand.

$3^{rd}$ **Place at Ipsos Datathon** | *Jupyter* **May 2023**

- Solved a case study about predicting a company's market share by trend analysis using ARIMA and Linear Regression.

## Technical Skills

**Languages**: Python, VHDL, MATLAB, Assembly 8051
**Developer Tools**: Pycharm, Jupyter Notebook
**Technologies**: Linux, GitHub, LaTex, MS applications
**Frameworks**: Pytorch, Tensorflow, Scikit-learn
**Electronics Tools**: LTSpice, DipTrace, Proteus, MCU IDE

## Publications 🎓

**Aysin Tumay**, Mustafa E. Aydin, Suleyman S. Kozat. "Hierarchical Ensemble-based Feature Selection for Time Series Forecasting." *IEEE Transactions on Signal Processing*, 2023. DOI: 10.48550/ARXIV.2310.17544. *(submitted)*

## Extracurricular

- Active member at Young Entrepreneurs Society, and IEEE Student Branch.
- Ankara Start-up Summit committee member for 2019, and 2020.
- Classical guitar player at high school orchestra.