Aras Güngöre

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Education

Boğaziçi University (Admission rate: 0.09%) — Istanbul, Turkey
Bachelor of Science in Electrical and Electronics Engineering; ***GPA: 3.67/4.00*** — *Sep 2018 – Present*

Boğaziçi University — Istanbul, Turkey
Minor Degree in Computer Engineering; ***GPA: 3.86/4.00*** — *Oct 2020 – Present*

- **Relevant coursework:** Discrete Computational Structures, Introduction to Object-Oriented Programming, Data Structures and Algorithms

Kocaeli Science High School (Admission rate: 0.85%) — Kocaeli, Turkey
High School Diploma; ***GPA: 97.03/100*** — *Sep 2014 – Jun 2018*

Experience

Nanonetworking Research Group, Boğaziçi University — Istanbul, Turkey
Undergraduate Research Assistant — *Oct 2021 – Present*

- Currently working with Assoc. Prof. Ali Emre Pusane on the project "Design and Implementation of Molecular Communication Systems Using Index Modulation" under the TÜBİTAK 2247-C Intern Researcher Scholarship Program (STAR).
- Simulated the Brownian motion of molecules in a SISO MCvD system and predicted simulation parameters such as receiver radius, diffusion coefficient, and transmitter-receiver distance using CNNs with Python.
- Plotted the arrival of molecules per symbol duration in a SISO MCvD system using Binomial, Poisson, and Gaussian model approximations with MATLAB.
- Ran Monte Carlo simulations of the Gaussian model to encode/decode randomized binary sequences in a SISO MCvD system using BCSK modulation technique and calculated the bit error rate (BER) on Z-channel.

SESTEK Speech Enabled Software Technologies — Istanbul, Turkey
Natural Language Processing R&D Intern — *Jan 2022 – Feb 2022*

- Implemented common NLP tasks using transformers such as named-entity recognition (NER), part-of-speech (POS) tagging, sentiment analysis, text classification, and extractive/generative question answering.
- Built a generative question answering system via Dense Passage Retrieval (DPR) and Retrieval-Augmented Generation (RAG) using the Haystack framework with Python.
- Worked on a custom Turkish open-domain question answering system by fine-tuning a BERT base model transformer. Evaluated the exact match and F1 scores using different Turkish data sets and compared the evaluation results.

Ankara Metropolitan Municipality — Ankara, Turkey
SCADA Engineering Intern — *Aug 2021 – Sep 2021*

- Worked in SCADA and Energy Efficiency division under the Head of Facilities department of Ankara Metropolitan Municipality Water and Sewerage Administration.
- Designed GSM/GPRS based electrical control panels that are connected to local water pump automation systems. Pump station panels use digital output data received from the SCADA control center via RF transmission to control valves and pumps. Tank station panels are charged from the PV system and refill water tanks by signaling the pump station panel when the float switch is activated.
- Implemented motor control circuits by reading their PLC ladder diagrams and analyzed the EPLAN project documentation, HMI, and hardware components of an RTU panel.

Meteksan Defense Industry Inc. — Ankara, Turkey
Analog Design Engineering Intern — *Jul 2021 – Aug 2021*

- Designed numerous analog circuits such as voltage-mode controlled buck converter, phase-shifted full bridge isolated DC-DC converter, and EMI filters with LTspice. Integrated these circuits and implemented a 320 W power distribution unit to be used in a radar system's power circuit board.
- Researched real-world compatible electronic components to be used in such circuits such as GaNFETs, high-side gate drivers, and Schottky diodes.
- Assembled PCBs of both common and differential mode filters and used VNA Bode 100 to measure the cut-off frequencies.

Achievements

National University Admission Exam (YKS): Ranked 75^{th} in Mathematics and Science among ca. 2.3 million candidates with a test score of 489.92/500.

KYK Outstanding Success Scholarship: Awarded to undergraduate students who have been ranked in the top 100 on National University Admission Exam by Higher Education Credit and Hostels Institution (KYK).

Boğaziçi University Success Scholarship: Awarded to undergraduate students who have been ranked in the top 100 on National University Admission Exam by Boğaziçi University.

TÜBİTAK 2247-C Intern Researcher Scholarship: Awarded to undergraduate students who take part in research projects carried out by Scientific and Technological Research Council of Turkey (TÜBİTAK).

Duolingo English Test (DET): Overall Score: 135/160

Boğaziçi University English Proficiency Test (BUEPT): Achieved the highest grade A on the BUEPT grading scheme with a total score in the range of 85-100.

Kocaeli Science High School Salutatorian Award: Graduated as the second highest ranked student in my class.

Projects

Image Manipulation and Fractal Generation | *GitHub*

- A C project which implements a variety of image processing operations that manipulate the size, filter, brightness, contrast, saturation, and other properties of PPM images from scratch.
- Added recursive fractal generation functions to model popular fractals including Mandelbrot set, Julia set, Koch curve, Barnsley fern, and Sierpinski triangle in PPM format.

Chess Bot | *GitHub*

- A C++ project in which you can play chess against an AI with a specified decision tree depth that uses alpha-beta pruning algorithm to predict the optimal move.
- Aside from basic moves, this mini chess engine also implements chess rules such as castling, en passant, fifty-move rule, threefold repetition, and pawn promotion.

Integral Calculator | *GitHub*

- A C project which can calculate the definite integral of any given real function using midpoint method, trapezoidal rule, Simpson's rule, Boole's rule, and many other Newton-Cotes quadrature formulas.
- Alternatively, the project can be used to estimate the derivative of such functions and compute mathematical expressions according to the order of operations using recursive algorithms.

Netlist Solver | *GitHub*

- A MATLAB project that uses modified nodal analysis (MNA) algorithm to calculate the node voltages of any analog circuit without dependent sources given in netlist format.
- Added a module which sweeps the resistance of a load resistor, plots power dissipation as a function of load resistance, and finds the resistance value corresponding to maximum power.

CMPE 250 Projects | *GitHub*

- Five Java projects assigned for the Data Structures and Algorithms (CMPE 250) course on Fall 2021-22 semester.
- These projects apply DS&A concepts such as discrete-event simulation (DES) using priority queues, Dijkstra's shortest path algorithm, Prim's algorithm to find the minimum spanning tree (MST), Dinic's algorithm for maximum flow problems, and weighted job scheduling with dynamic programming to real-world problems.

Skills

Programming: C, C++, MATLAB, Java, Python, VHDL, MySQL, R

Technologies: LTspice, Xilinx ISE, Git, Arduino, Simulink

Languages: Turkish (Native), English (Professional), German (Limited), Russian (Elementary)

Certificates

Procter & Gamble VIA Certificate Program *Feb 2022*

Business Skills, Data and Digital Skills, Project Management and Personal Productivity

Organizations

Institute of Electrical and Electronics Engineers (IEEE) *Feb 2022 – Present*

Student Member