Aras Güngöre

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Education

Boğaziçi University — Istanbul, Turkey

B.Sc. in Electrical and Electronics Engineering; ***GPA: 3.62/4.00*** — *Sep 2018 – Jun 2023*

Minor Degree in Computer Engineering; ***GPA: 3.58/4.00*** — *Oct 2020 – Jun 2023*

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. (Jul 2018)

Skills

Languages: C/C++, C#, Java, Python, Go, JavaScript, TypeScript, SQL, Swift, Scala, MATLAB, R

Technologies: Qt, Flask, Django, Node.js, React.js, MySQL, MongoDB, Git, SVN, Docker, AWS, Kubernetes, GCP, Kafka, RabbitMQ, OpenCV, PyTorch, TensorFlow

Experience

Avikon — Istanbul, Turkey

Software Engineer — *Dec 2023 – Present, Full-time*

- Designed a Qt-based chat application utilizing TCP for real-time communication within a client-server architecture, demonstrating expertise in socket programming, data serialization, and message routing.
- Utilized IDL to define message types and designed a data-centric publish-subscribe architecture with OpenDDS. Implemented various QoS policies to facilitate the transmission of both volatile and persistent data.

SemperTech — Istanbul, Turkey

Software Engineer — *Sep 2023 – Dec 2023, Full-time*

- Worked on the "Arçelik Digital Home Energy" project in a collaborative effort with DAI-Labor at the Technical University of Berlin under the supervision of Prof. Dr. Şahin Albayrak.
- Simulated discovery, pairing, and data exchange processes using the EEBUS protocol suite with C# and Go. Migrated the framework from Go to C++ in order to ensure future adaptability for smart home IoT devices.
- Implemented the TLS protocol for secure data exchange using the X.509 standard and integrated multicast DNS for seamless communication to complement the development of SHIP and SPINE protocols.

Max Planck Institute for Intelligent Systems — Stuttgart, Baden-Württemberg, Germany

Undergraduate Researcher — *Jun 2022 – Aug 2022, Internship*

- Worked in the Robotics, Collectives and Learning subgroup at the Physical Intelligence Department with former Ph.D. students Sinan Özgün Demir and Alp Can Karacakol on a project about 3D printing and heat-assisted magnetic programming of soft machines under the supervision of Prof. Dr. Metin Sitti.
- Updated a ROS package for converting 3D motion controller events to ROS messages so that it synchronously operates at any given loop rate with C++.
- Implemented an Arduino Mega driver for controlling a fluid dispenser, a laser, thermocouples, and a coil set. Updated ROS nodes for parsing G-codes and controlling stage movement and built the ROS-Arduino communication network to simulate a 3D printing and magnetic programming process with Python.
- Designed the project's system and software architecture, algorithm flowchart, and state machine diagram. Implemented and debugged ROS nodes by validating each corresponding hardware component functions correctly.

Nanonetworking Research Group, Boğaziçi University — Istanbul, Turkey

Undergraduate Researcher — *Oct 2021 – Jun 2022, Part-time*

- Worked on the "Design and Implementation of Molecular Communication Systems Using Index Modulation" project under the supervision of Prof. Dr. Ali Emre Pusane.
- 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 Keras and TensorFlow.
- 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 and decode randomized binary sequences in a SISO MCvD system using BCSK modulation technique and calculated the bit error rate on Z-channel.

SESTEK Speech Enabled Software Technologies Istanbul, Turkey

AI Research and Development Intern *Jan 2022 – Feb 2022, Internship*

- Executed diverse NLP tasks, including NER, POS tagging, sentiment analysis, text classification, and extractive and generative QA using transformers and Hugging Face libraries. Conducted a thorough literature review on information retrieval and reading comprehension to stay updated on the state-of-the-art ML models.
- Developed a generative QA system with dense passage retrieval (DPR) and retrieval-augmented generation (RAG) techniques using the Haystack framework and PyTorch.
- Worked on a Turkish open-domain QA system made by fine-tuning BERTurk and XLM-Roberta models. Tabularized exact match and F1 scores derived from DeepMind's XQuAD and various Turkish data sets.

Awards & Achievements

High Honors Degree: Awarded to Bachelor alumni who have graduated with a GPA greater than or equal to 3.50 by Boğaziçi University. (Jul 2023)

TÜBİTAK 2247-C Intern Researcher Scholarship: Awarded to students who take part in research projects carried out by the Scientific and Technological Research Council of Turkey (TÜBİTAK). (Dec 2021 – Jun 2022)

KYK Outstanding Success Scholarship: Awarded to students who have been ranked in the top 100 on National University Admission Exam by Higher Education Credit and Hostels Institution (KYK). (Sep 2018 – Jun 2023)

Kocaeli Science High School Valedictorian Award: Graduated as the highest ranked student. (Jun 2018)

Projects

Filters and Fractals | *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 and recursive fractal generation functions to model popular fractals including Mandelbrot set, Julia set, Koch curve, Barnsley fern, and Sierpinski triangle.

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.

DS&A Projects | *GitHub*

- Five Java projects that apply DS&A concepts such as discrete-event simulation using priority queues, Dijkstra's shortest path algorithm, Prim's algorithm to find the minimum spanning tree, Dinic's algorithm for maximum flow problems, and weighted job scheduling with dynamic programming to real-world problems.