Serhan YILMAZ

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OBJECTIVE: A CS student with a focus on NLP, Machine Learning and AI with many years of work and research experience around the world seeking opportunities to develop NLP and Computer Vision applications at NVIDIA.

EDUCATION

Computer Science — *Bachelor of Science*   SEP 2021 - JUN 2025
Sabanci University   cGPA: **3.62**/4
- ***Relevant Coursework:*** Machine Learning, Digital Image Processing, Linear Algebra, Statistics, Discrete Math, Algorithms, Data Structures, Advanced Programming, Operating Systems, Database Systems
- Ranked **top 0.02%** among 2.9 million students in the National University Entrance Exam.

WORK EXPERIENCE

Carnegie Mellon University — *Research Assistant*   DEC 2023 - PRESENT
- Working with Prof. Kemal Oflazer on developing advanced question generation and paraphrasing algorithms.
- Developing refined training methods with feedback signals for semantic understanding in paraphrasing.
- Employing transfer learning techniques to fine-tune T5 and BERT models for an encoder-decoder architecture.
- Achieved 91% accuracy in generating high-quality, diverse research questions from input data.
- Evaluated generated questions using metrics like BLEU and METEOR, scoring in the top 10% compared to existing benchmarks.

Yapi Kredi Bank — *Part-Time NLP R&D Engineering Intern*   OCT 2023 - PRESENT
- Improving document interpretation algorithms with OCR-free Donut Transformers.
- Fine-tuned BERT and BERTurk language models, cutting annotation effort through transfer learning techniques.
- Worked with cross-functional teams to translate business requirements into effective NLP solutions.

kAi Sabanci — *Club Founder/President*   MAR 2023 - PRESENT
- Founded, led, and grew kAi Sabanci, Sabanci University's AI and ML club, attracting **600+ members with 80% participation rate** in under 1 year.
- Organized workshops and served as a voluntary TA, delivering sessions from NVIDIA DLI in Gen AI, NLP, Conversational AI, Machine Learning, Deep Learning and CUDA with instructors from around the world.
- Developed and managed several key projects in collaboration with academic faculty including the ***kAi Sabanci website***, our RAG-enabled Chatbot -ChatSU- as a service, 3D campus modeling with NeRF and campus cat identification with Jetson Nano.
- Organized panels on the AI revolution and transformation across the industry and academia, with notable guests from Stanford, Caltech, NVIDIA including **Simon See**.
- Held watchparties and gatherings for international developer conferences including GTC.
- Got kAi to become the **first** member of the **NVIDIA Student Network** in Europe. Received content & material support from NVIDIA, **met with Jensen Huang in Stockholm.**
- **Selected for the NVIDIA Student Spotlight series** for outstanding perseverance, dedication and achievement.

EPFL - École Polytechnique Fédérale de Lausanne — *Summer@EPFL Intern*   JUN 2023 - SEP 2023
- Optimized gradient aggregation functions using PyTorch and CUDA to work up to 2200% faster.
- Restructured the ML pipeline, added more functionality and modulized the code.
- Published a Python library for high-performance Distributed & Federated ML applications.
- Created a Webpage with Flask backend to publish benchmarking leaderboards.

Sabanci University — *Undergraduate Teaching Assistant*   SEP 2022 - JAN 2023
- Wrote homework assignments for students and held weekly recitation and office hours.

Boston University — *Undergraduate Research Assistant*   JUN 2022 - SEP 2022
- Studied Threat Modeling and Component Design for large-scale server systems under the supervision of Prof. Rabia Tugce Yazicigil.
- Developed a helper tool using C++ which provided up to 336 different combinations to design secure servers for resource-intensive applications.

Pharus Tech — *Intern*   JUL 2020 - SEP 2020
- Explored data from the ESCO dataset, including 3008 occupations and 13890 skills.
- Visualized data relating to skill sets required for jobs using Pandas and NumPy.

Koc University — *Undergraduate Research Assistant*   JUN 2020 - JUL 2020
- Worked with Prof. Hakan Urey to train a machine learning model with TensorFlow on a dataset of **600** retinal images for cataract detection.
- Wrote a comprehensive final report and delivered a presentation about the project's methodology and findings.

Awards

NVIDIA — *NVIDIA Student Spotlight*   Mar 2023 - Present
- Selected for the NVIDIA Student Spotlight series for outstanding perseverance, dedication and achievement.

Sabanci University — *Sakip Sabanci Award for Outstanding Success*   Sep 2022 - Present
- Ranked **top 4%** among the students in my term.

The Royal Swedish Academy of Engineering Sciences — *Innovation in Crisis*   May 2020 - Present
- Young Innovation in Times of Crisis Award for ranking in the **1st place** among all projects.

The New York Academy of Sciences — *Membership Award*   Sep 2019 - Present
- Young Member of the New York Academy of Sciences Award for admission into "The Junior Academy" program with an acceptation rate of **8%**.

Projects

New York Academy of Sciences — *Combating Covid-19*   Jan 2020 - May 2020
- Developed and visualized an algorithm to match job seekers with job providers in the Covid-19 outbreak.
- **Awarded 1st Place** by the Royal Swedish Academy of Engineering Sciences.

Carnegie Mellon University — *Advanced Question Generation and Paraphrasing*   Dec 2023 - Present
- Worked with Prof. Kemal Oflazer to develop algorithms for generating and paraphrasing research questions.
- Employed transfer learning techniques to fine-tune T5 and BERT models, achieving 91% accuracy in generating diverse questions.

EPFL Lausanne — *Project Charisius for Federated ML*   Jun 2023 - Sep 2023
- Optimized gradient aggregation functions using PyTorch and CUDA for a speed increase of up to 2200%.
- Restructured the ML pipeline for added functionality and modularity.
- Published a Python library for distributed and federated ML applications.

Sabanci University — *Project Sanity Check*   Feb 2023 - May 2023
- Developed an education index for all provinces of Turkey using machine learning to measure the expected education indices for the year 2020.
- Compared the predicted indices with the actual education index from 2020 to assess the impact of the Covid-19 pandemic on education in different Turkish provinces.
- Presented the index and results on an interactive, online map, providing a visual representation of the pandemic's effect on education across Turkey.

Koc University — *Cataract Detection using Machine Learning*   Jun 2020 - Jul 2020
- Trained a machine learning model with TensorFlow on a dataset of 600 retinal images for cataract detection.
- Delivered a comprehensive final report and presentation on the project's methodology and findings.

kAi Sabanci — *NeRF Project at Sabanci University (NERFSU)*   Sep 2023 - Present
- Led an ambitious project to create a detailed 3D digital model of Sabanci University's campus using Neural Radiance Fields (NeRF) and advanced AI/ML algorithms.
- Analyzed a vast collection of high-resolution photographs from various angles to extract visual details and structural information.
- Employed the NeRF algorithm to infer the underlying 3D structure, resulting in an immersive and realistic representation of the university for virtual exploration and interactive experiences.

kAi Sabanci — *Parking Spot Detection*   Apr 2023 - June 2023
- Developed a computer vision-based system for real-time detection and classification of parking spots using deep learning algorithms.
- Utilized convolutional neural networks (CNNs) and advanced image processing techniques to analyze live video feeds from parking lot cameras.
- Applied object detection and classification algorithms to accurately identify and track vehicles within the parking premises, aiming to revolutionize parking management and improve overall parking efficiency.

kAi Sabanci — *ChatSU Implementation*   Mar 2023 - Present
- Implemented ChatSU, a chat generative AI powered by GPT-4, into a website to converse with visitors and respond to their queries using natural language.
- Integrated the AI system into the website's backend and frontend, allowing for seamless interaction through a chat window.
- Planned future improvements, including training a text-to-speech model for ChatSU to speak responses and a speech-to-text model to enable voice-based conversations with users.

Skills

- **Languages & Tools: Python, Java, Javascript, HTML/CSS, C, C++, Docker, Linux**
- **Libraries: PyTorch, TensorRT, JAX, PyTorch Lightning, TensorFlow, OpenCV, CUDA, OpenGL, NumPy, Pandas, Keras, Flask, React**