

# Emil Gasimov

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## EDUCATION

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### QUEEN MARY UNIVERSITY OF LONDON, London, United Kingdom

MSc in Artificial Intelligence

Sep. 2024 – Sep. 2025

- Grade: Distinction (81/100)
- Thesis: *READ-ECG: Digitization of ECG Papers via Attention-Based Decoding*
- Coursework: Deep Learning & Computer Vision, Machine Learning, Artificial Intelligence, Applied Statistics

### SABANCI UNIVERSITY, Istanbul, Turkey

BS in Computer Science & Engineering, Physics (minor)

Sep. 2020 – June 2024

- GPA: 3.22/4.0
- Thesis: *Advanced Data Augmentation Techniques for Cow Behavior Estimation*
- Coursework: Data Structures & Algorithms, Machine Learning, Computer Vision, Digital Image & Video Analysis, Software Engineering, Logic & Digital Systems, Theory of Computation & Automata Theory

## PUBLICATIONS

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**Emil Gasimov**, X. Zheng, D. Shi, X. Diao, F. Cheng, G. Slabaugh, and X. Chen. "READ-ECG: Digitization of ECG Papers via Attention-Based Decoding." In preparation for submission to the 29th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2026.

## EXPERIENCE

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### Queen Mary University of London – Graduate Researcher

Dec. 2024 – Present

#### READ-ECG: Digitization of ECG Papers via Attention-Based Decoding – Python, PyTorch, SGE

- Led research on a novel *Image → Signal → Analysis* paradigm to overcome the limitations of direct classification on paper-based ECGs by decoupling signal reconstruction from clinical interpretation.
- Architected a novel End-to-End CNN-Transformer model for high-fidelity signal reconstruction, developing a composite loss function that integrates time, frequency, and perceptual metrics to ensure clinical-grade accuracy.
- Designed and executed a rigorous experimental framework to first quantify the performance gap between signal and image domain analysis, then validate the superiority of the proposed pipeline on downstream tasks.
- Engineered a scalable data pipeline to process, augment, and benchmark performance across multiple large-scale public and private ECG datasets, including PTB-XL and MIMIC-IV-ECG.

### Program for Undergraduate Research (PURE) – Research Intern

Feb. 2024 – September 2024

#### Retinal OCT Scan Analysis for Alzheimer's Disease Detection – Python, PyTorch

- Collaborated in a team on a project using deep learning to detect early signs of Alzheimer's Disease from retinal OCT scans.
- Worked on domain adaptation to solve the problem of working with unsegmented OCT scans from the UK Biobank dataset.
- Modified a CycleGAN network to adapt segmented OCT scans from one dataset to the unsegmented scans of another, keeping the labels intact.
- Focused on preparing OCT scans for Alzheimer's Disease stage classification by improving segmentation techniques, aiming for a model that's both effective and accurate.

## Using GPUs for Graph Partitioning via Embedding – Python, C++, CUDA

- Conducted research on sparse matrices, graph embeddings, and graph reordering algorithms to enhance understanding of high-performance computing techniques.
- Developed a comprehensive pipeline using GOSH, a graph embeddings tool, and a logistic regression model to evaluate the quality of graph embeddings through edge link prediction.
- Innovatively implemented different initialization methods in GOSH and designed varied feature sets to optimize logistic regression outcomes.
- Conducted tests with diverse sparse matrix types, analyzing embedding effectiveness and insights through logistic regression coefficient evaluations.

Sabanci University – Teaching Assistant, Logic & Digital System Design (CS303) Feb. 2024 – June 2024

- Hosted lab sessions, teaching and guiding students through assignments and facilitating problem-solving.
- Developed answer sheets to aid students in understanding complex homework assignments.
- Graded lab assignments and projects, ensuring fair assessment and providing constructive feedback.

kAi Sabanci Club - Project Member

May 2023 – May 2024

- Participated in workshops and projects focused on deep learning, high-performance computing, and other AI-related topics.
- Engaged with experts and mentors from NVIDIA through the club's sponsorship under the Student Network program.
- Collaborated with fellow AI enthusiasts, contributing to the club's community and projects.

## PROJECTS

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### Advanced Data Augmentation Techniques for Cow Behavior Estimation — Python, TensorFlow

- Developed data augmentation methods to enhance machine learning models for cow behavior estimation, addressing data scarcity and imbalance.
- Adapted and innovated augmentation techniques for numerical time series data, improving model accuracy without extensive data collection.
- Utilized Python to implement a decision tree pipeline for data accuracy assessment and applied augmentation techniques to evaluate their impact on model performance.
- Conducted experiments to validate the effectiveness of augmentation methods, aiming to improve cow behavior estimation systems.

### Fine-tuning GPT3.5 Chat Model with WhatsApp Messages — Python, OpenAI API

- Implemented fine-tuning of OpenAI's GPT3.5 chat model using WhatsApp chat messages to emulate the messaging style of a specific user based on their previous conversations.
- Preprocessed and parsed the WhatsApp chat data using Python to prepare it for fine-tuning.
- Utilized OpenAI's API for the fine-tuning process, following their guide on fine-tuning and continuously exploring ways to improve efficiency.
- Wrote comprehensive documentation for the project, providing clear instructions for usage and installation.

### Rubik's Cube Solver from Photo — Python, OpenCV2

- Implemented a Rubik's Cube solver using computer vision and image processing techniques, with a focus on recognizing individual facelets from images of the cube.
- Utilized OpenCV2 library in Python for image processing and analysis.
- Wrote a comprehensive report about the project, detailing the algorithm design and implementation, along with the experimental results and analysis.

## SKILLS

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- Languages:** English (Advanced), Russian (Native), Azerbaijani (Native), Turkish (Professional)
- Programming Languages:** C++, Python, MATLAB, Verilog
- Technologies & Frameworks:** PyTorch, TensorFlow, OpenCV, CUDA, Pandas, Git, SGE, Slurm