

# Hakancaan Ozturk

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## PROFESSIONAL EXPERIENCE

**Software Development Engineer** | *Amazon - London, UK* 01/2025 - Present

- Optimizing Prime Video UI components, reducing rendering time by 20% for over 100M customers, improving app responsiveness on low-end devices through LLM-powered automation.
- Investigated and found inefficiencies in the Prime Video TV app, optimizing the code to use 4% less memory for over 200M customers, improving performance on resource-constrained devices.
- Developed LLM agent platform for real-time analysis of 10M+ Prime Video operational metrics, enabling rapid system regression detection and award recognition at London-wide Amazon hackathon.
- Supervised 3-month internship extending AI agent capabilities for oncall investigation, now productionizing the platform for 100+ engineers.

**Founding Engineer** | *Albus Technologies - London, UK* 05/2024 - 01/2025

- Engineered and optimized a scalable Retrieval-Augmented Generation (RAG) system with context-enriched vector search, boosting retrieval relevance by 30% and serving 50K+ users.
- Developed scalable real-time Document Semantic Extraction pipelines and LLM agents using AWS (Lambda, S3, SQS, EC2), processing millions of PDF pages and over hundreds of hours of audio.
- Established automated CI/CD workflows (Docker, GitHub Actions) to deploy FastAPI and Lambda endpoints, enabling dozens of concurrent file uploads with low-latency, robust production.

**Computing Researcher** | *Max Planck Institute - Stuttgart, Germany* 06/2022 - 12/2022

- Enhanced robotics dynamics prediction by deploying ML data pipelines analyzing 10TB simulation data; optimized CFD simulations via novel HPC scheduling, achieving 200x speedup, enabling 4 publications.

## EDUCATION

**Imperial College London** | *MSc in Applied Computational Science and Engineering* 2023-2024

Highest overall grade in class | Class representative Distinction (78.27%)

Modules: Machine/Deep Learning, Numerical Methods, Computational Maths, Optimization

**Koc University** | *BSc in Mechanical Engineering* 2020-2023

Ranked 1st in class | Graduated one year early | Merit scholarship (\$30k annually) GPA: 3.99/4.00

**Robert College** | *High School Diploma* 2015-2020

AP Chemistry: 5/5 | AP Calculus AB: 5/5 | IELTS: 8.0/9.0

## PROJECTS

**AI Surrogate Modeling for Turbulent Flow Simulations** | *Imperial College London* 2024 - 2025

- Discovered a novel Grid-Invariant AI architecture (PyTorch) combining convolutional autoencoders and adversarial networks to simulate high-fidelity turbulent flows, achieving unprecedented grid independence and scalability.
- Conducted 2000+ GPU hours of High-Performance Computing (HPC) for model optimization, enhancing long-term stability by 35% and prediction accuracy by 50%.
- Actively open-sourcing advancements (manuscripts in prep/review), with project development backed by big tech companies and university institutions.

**Advanced Collagen Fiber Orientation Analysis** | *Pekkan Biofluid Mechanics Laboratory* 2023 – 2024

- Directed advanced bio-imaging analysis (FFT, SVR, CNNs) achieving 95% accuracy in collagen orientation prediction, while also implementing novel Generative Diffusion Models (PyTorch) for 10x biological data augmentation.

## **Earthquake Predictive Modeling | Graduation Project - Koc University**

2023

- Developed predictive modeling framework for earthquake impact assessment in Turkey, focusing on viscous wall dampers performance optimization using computational mechanics and ML techniques, ranked 2nd in university.

## **TUSAS Aerospace Industry Collaboration | ML Failure Prediction Models**

2021

- Built ML prediction models for failure detection in aerospace components in collaboration with Turkish Aerospace Industries (TUSAS), awarded 2nd place in annual university-industry partnership program.

## **LEADERSHIP & MENTORING**

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### **Amazon Software Engineering Intern Mentorship | Prime Video Team**

2025

- Mentored software engineering intern over 3-month period, co-developing project deliverables and securing return offer through successful performance guidance.

### **Imperial College Students Mentoring | Amazon University Engagement Program**

2025

- Leading 3 Imperial College students on Revizion, an AI-powered GCSE and A-levels review app development through Amazon University Engagement Program.
- Guiding technical stack selection, system design, AI features implementation, and software engineering best practices while leading the end-to-end project development.

### **Koc University Students Mentoring | AI/ML Projects**

2025

- Mentoring 2 Koc University students in AI/ML projects, helping them build applications with industry-standard software engineering practices and providing technical guidance on system architecture.

## **SPEAKING & MEDIA COVERAGE**

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### **Amazon Engineering Presentation | Agentic AI Tools and MCPs**

2025

- Presented "Agentic AI Tools and MCPs for Engineering Tasks" to 30+ Amazon engineers in person, with 500+ Amazon engineers viewing online and 1000+ engineers viewing the setup video.

### **Koc University Mechanical Engineering Society Podcast | Studies and Careers in UK**

2024

- Discussed studies and careers in the UK (English) - 500+ YouTube views.

## **SKILLS**

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Languages: Python, TypeScript/JavaScript, C++, MATLAB

Libraries & Frameworks: PyTorch, scikit-learn, pandas, numpy, FastAPI, React, LangChain

Cloud & DevOps: Docker, AWS, Github Actions, Terraform, HPC, Parallel Computing

## **ACHIEVEMENTS & AWARDS**

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- Koc University Early Graduation: First student in university history to complete 4-year Mechanical Engineering degree in 3 years while ranking 1st in class.
- Y Combinator AI Startup School (San Francisco, 2025): Selected among top 2000 CS students/grads globally, networked with YC partners and received invitation to apply to YC batch.
- Viridien & Imperial College Hackathon Winner (1st out of 30 teams): Developed classification ML models for Carbon Capture & Seismic Data Analysis.
- Turkish University Entrance Exam: Ranked 300th out of 2 million students nationwide (top 0.015%)
- Turkish High School Entrance Exam: Ranked 1st out of 1 million students nationwide
- KPMG Ideation Challenge National Winner and global finalist: Co-developed an AI-driven mental wellness application.

## PUBLICATIONS

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5 papers, 27+ citations

Ozturk, H.\*, Bozuyuk, U.\*, & Sitti, M. (2023). Microrobotic locomotion in blood vessels: a computational study on the performance of surface microrollers in the cardiovascular system. *Advanced Intelligent Systems*, 5(9), 2300099.

Bozuyuk, U.\*, Ozturk, H.\*, & Sitti, M. (2023). The mismatch between experimental and computational fluid dynamics analyses for magnetic surface microrollers. *Scientific Reports*, 13, 10196.

Saruhan, E. N., Ozturk, H., Kul, D., Sevgin, B., Coban, M. N., & Pekkan, K. (2025). Learning-enhanced 3D fiber orientation mapping in thick cardiac tissues. *Biomedical Optics Express*, 16(8), 3315-3336.

Arslan, B., Bozuyuk, U., Görgülü, K., Yildiz, E., Ozturk, H., Liotta, L., Heinemann, V., Algül, H., & Sitti, M. (2025). Anisotropic Surface Microrollers for Endovascular Navigation: A Computational Analysis with a Case Study in Hepatic Perfusion. *Advanced Theory and Simulations*, 2400387.

Yorulmaz, M., Bozuyuk, U., Park, M., Arslan, B., Ozturk, H., Aghakhani, A., & Sitti, M. (2025). Locomotion Behavior of Magnetic Microrollers in Confined Tubular Geometries Containing Shear-Thinning Fluids. *MARSS 2025*, West Lafayette, USA.