Hakancan Ozturk

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PROFESSIONAL EXPERIENCE

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

- Migrating Prime Video UI elements from React to SolidJS, reducing UI rendering time by 10% for over 100M customers, making the app smoother for low-end devices through LLM-powered automation pipelines.
- Investigated and found inefficiencies in the Prime Video TV app, optimizing the code to use 5% less memory for over 150M customers, improving performance on resource-constrained devices.
- Pioneered the use of LLM agents (Python) connected via MCP to perform real-time analysis on over 10 million Prime Video operational metrics, enabling rapid detection of system regressions (Project won London-wide hackathon).
- Mentored an Imperial College student for her 3-month summer internship on productioning an AI agent for oncall investigation, co-authored the project which the engineering team is now adopting.

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 (SVMs, curve fits) analyzing 10TB simulation data; optimized CFD simulations via novel HPC scheduling, achieving 200x speedup, enabling 3 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

PROJECTS

MSc Dissertation: 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 NVIDIA.

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* 2022 – 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

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

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.

Koc University Mechanical Engineering Society Podcast | *Studies and Careers in UK* 2024

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

SKILLS

Languages: Python, Javascript, C++, MATLAB
Libraries & Frameworks: PyTorch, scikit-learn, pandas, numpy, FastAPI, React
Cloud & DevOps: Docker, AWS, Github Actions, HPC, Parallel Computing

ACHIEVEMENTS & AWARDS

- Y Combinator AI Startup School (San Francisco, 2025): Selected among top 2000 CS students/grads globally.
- Viridien & Imperial Hackathon Winner: Developed ML models for Carbon Capture & Seismic Data Analysis.
- High School Entrance Exam: Ranked 1st/1M; University Entrance Exam: Ranked 300th/2M (Turkey); IELTS: 8.0.

PUBLICATIONS

5 papers, 27+ citations

Bozuyuk, U.*, Ozturk, H.*, & 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.