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** to enhance performance, leveraging **LLM-powered automation pipelines** for efficient component refactoring and codebase optimization.
- Developing features for Prime Video Client Software Development Kit (SDK), enhancing streaming capabilities and user experience across multiple platforms.

Machine Learning Engineer | *Albus Technologies - London, UK*   05/2024 - 01/2025
- Designed a **Retrieval-Augmented Generation (RAG)** framework with context-enriched vector search, boosting retrieval relevance by 30% compared to BM25 methods.
- Developed scalable real-time **Document Semantic Extraction** pipelines and **LLM agents** using **AWS** (Lambda, S3, SQS, EC2), processing millions of PDF pages and over 50K minutes of audio.
- Established automated **CI/CD** workflows (Docker, GitHub Actions) to deploy **FastAPI** and **Lambda** endpoints, enabling dozens of concurrent file uploads and serving over 150K customers with low-latency, robust production.

Computing Researcher | *Max Planck Institute - Stuttgart, Germany*   06/2022 - 12/2022
- Conducted **computational fluid dynamics (CFD)** simulations for biomedical micro-robots, achieving 200x efficiency gains through optimized **COMSOL simulations** in HPC environments, leading to two publications in top journals.
- Deployed advanced data processing pipelines using **curve fits** and **support vector machines (SVMs)** to analyze 10TB of simulation data, significantly improving predictive accuracy for robotics dynamics characterization.

EDUCATION

Imperial College London | *MSc in Applied Computational Science and Engineering*   09/2023-09/2024
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
Assistant: Introduction to Engineering - Fluid Mechanics - Numerical Methods
Modules: Propulsion Systems, Microsensors, Makerspace, Finite Element Method

PROJECTS

MSc Dissertation: AI Surrogate Modeling for Turbulent Flow Simulations | *Imperial College London*   2024 - 2025
- Discovered a novel **Grid-Invariant AI architecture** combining convolutional autoencoders and adversarial networks to simulate high-fidelity **turbulent flows**, achieving unprecedented **grid independence** and scalability.
- Conducted **1000+ GPU hours** of High-Performance Computing (HPC) for model optimization, enhancing **long-term stability** by 35% and prediction accuracy by 50%, with research leading to a forthcoming publications.

Advanced Collagen Fiber Orientation Analysis | *Pekkan Biofluid Mechanics Laboratory*   2023 – 2024
- Led advanced bio-imaging analysis using **Fast Fourier Transform (FFT)**, **Support Vector Regression (SVR)**, and **CNNs**, achieving 95% accuracy in collagen fiber orientation prediction.
- Implemented a novel method leveraging **Generative Diffusion Models** in **PyTorch** for biological data augmentation, increasing dataset size by 10x while preserving accuracy.

SKILLS & PUBLICATIONS

Languages & Libraries: Python, Javascript, C++, MATLAB, PyTorch, scikit-learn, FastAPI, React
Cloud & DevOps: Docker, AWS, Github Actions, HPC, Parallel Computing, High-Performance Computing
Publications | *2 papers with >15 citations*
- Published papers on microrobotics and ML in **Nature** Scientific Reports and **Advanced** Intelligent Systems.
- Preparing papers in collaboration with Max Planck Institute, BML(Koc), and ACMG(Imperial) groups.