Sami Hatoum

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Education

University of St Andrews — 2021 – 2025
BSc Computer Science — *First Class Honours, Dean's List*

University College London — 2025 – 2026
MSc Artificial Intelligence and Medical Imaging — *Predicted Distinction*

Experience

PricewaterhouseCoopers (PwC) — *Jun 2024 – Aug 2024*
Software Consulting Intern (AI)

– Built a **sentiment analysis model** using **PyTorch BERT** to automate customer feedback classification for a retail client. Achieved **91% F1 score** on an imbalanced dataset (3:1 negative to positive), processing **10,000 reviews daily**
– Engineered containerised deployment with **Flask API** on **AWS EC2** with auto-scaling across multiple instances. Collaborated with 3 senior consultants to validate **sub-500ms latency** under load testing
– Set up **CloudWatch** monitoring dashboards and wrote a retraining script triggered when weekly evaluation accuracy dropped below **85%**
– Optimised the preprocessing pipeline with **pandas vectorisation**, reducing daily batch processing time by **60%**

PricewaterhouseCoopers (PwC) — *Aug 2023 – Sep 2023*
Software Engineering Intern

– Developed an internal **client onboarding dashboard** in **React** and **Node.js** that replaced a manual spreadsheet workflow for a financial services team, reducing onboarding processing time from **3 days to 4 hours**
– Designed and implemented a **PostgreSQL** data model with role-based access control, integrating with PwC's internal **SSO authentication** system
– Wrote **CI/CD pipelines** in **GitHub Actions** with automated testing and staged deployments to **AWS**, achieving **90%+ code coverage** across 45 unit and integration tests

Projects

Database Query Optimiser

– Developed a **PostgreSQL analysis tool** that parses **query ASTs**, evaluates **EXPLAIN plans**, and recommends indexes. Reduced query execution time from **2.4s to 420ms** on table scans over **500K rows**
– Reviewed **200+ production queries** across a **five-million-row database** (12 tables), identifying **21 missing indexes** that reduced average query time by **65%**
– Deployed on **AWS ECS** with **RDS PostgreSQL**, implementing **CloudWatch** alerts and **auto-scaling groups** for batch analysis traffic spikes

Selective Prediction for Medical Image Segmentation (MSc Dissertation)

– Built a **model-agnostic selective prediction framework** that determines when AI segmentation outputs are reliable or should defer to a human expert, reducing silent failures in clinical deployment
– Implemented **Monte Carlo Dropout** inference (T=20 forward passes) with entropy, mutual information, and coefficient of variation aggregation to produce per-scan deferral decisions
– Achieved **0.89 Dice score at 85% coverage** on 9-class segmentation, with an evaluation pipeline generating accuracy-coverage curves, calibration plots, and per-class reliability diagrams

Hierarchically Weighted Image Segmentation (Group Project)

– Designed a custom **hierarchical loss function** with domain-specific penalty weights and asymmetric error costs, prioritising high-risk regions where misclassification has severe downstream consequences
– Trained a **3D Residual Encoder U-Net** achieving **0.886 mean Dice score**; improved segmentation of the smallest and hardest class from **0.630 to 0.659** over unweighted baseline
– Conducted **ablation studies** across loss functions and weighting schemes, isolating contributions of each penalty term

Skills

Programming Languages: Python, Java, JavaScript, TypeScript, SQL
Frameworks: React, Next.js, Node.js, Flask, React Native
Cloud & DevOps: AWS (Certified Cloud Practitioner), Docker, Git, Kubernetes, Jira, CI/CD
AI & Machine Learning: TensorFlow, PyTorch, BERT, NLP, U-Net, Scikit-learn, Pandas, NumPy