

Al-Hussein Abutaleb

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Highlights

- Research experience in Machine Learning and Deep Learning, specialising in Knowledge Distillation and Computer Vision, complemented by a strong background in Systems and Computational Biology
- Award-winning educator and science communicator, adept at engaging technical and non-specialist audiences with over 1200 class hours teaching Artificial Intelligence and Machine Learning
- Interdisciplinary background spanning engineering, neuroscience, and artificial intelligence
- Experienced in PyTorch and LangChain

Skills

Languages: Python, JavaScript/React, SQL

Machine Learning/Deep Learning Frameworks: PyTorch, TensorFlow/Keras, Scikit-learn, XGBoost, Pandas

Artificial Intelligence/Large Language Models (LLM) Tools: LangChain, LangSmith, OpenAI API, HuggingFace Transformers, Pinecone, ChromaDB

MLOps/Tools: Docker, Git, Weights & Biases, GitHub Actions, MLflow, Jupyter, VSCode

Techniques: Statistics, Differential Calculus, Linear Algebra, Probability Theory, LoRA, QLoRA, Semantic Search

Experience

Freelance AI Engineering Instructor, IronHack Feb 2025 – Present

- Delivered AI Engineering bootcamps for IronHack on a freelance, cohort-based basis across multiple intakes in 2025 and 2026, including both in-person and remote cohorts
- Taught over 900 AI Engineering class hours across multiple bootcamp cohorts
- Supported learners who later secured roles at organisations including Oracle, Lucidya, and government institutions
- **Lead Instructor, Saudi Digital Academy (SDA) Bootcamp** (Feb 2025 – May 2025, Riyadh, Saudi Arabia – in person): mentored 23 students through an intensive full-stack AI curriculum enhanced with custom content; three students were invited by Saudi Arabia's Ministry of Communications and Information Technology to present their projects
- **Lead Instructor, AI Engineering Bootcamp** (Feb 2026 – Apr 2026, Remote – European market): taught core Machine Learning, Computer Vision, NLP, LangChain, AI Agents, and Retrieval-Augmented Generation (RAG)
- **Part-time Instructor, AI Bootcamp** (Mar 2026 – Present, Remote – European market): delivering part-time teaching and student support alongside concurrent bootcamp activities
- Managed a team of two teaching assistants and adapted curriculum delivery across multiple cohorts

AI Teaching Fellow, People-Centred AI Institute (PAI) – Guildford, UK Sept 2024 – Feb 2025

- Taught and supervised over 300 class hours in AI and Machine Learning across the online MSc AI programme at the People-Centred AI Institute, University of Surrey
- Led teaching delivery and academic support for the *Fundamentals of Machine Learning* module, including student supervision, assessment support, and moderation
- Designed and delivered a week-long AI Bootcamp for incoming PhD students at the Centre for Doctoral Training, introducing core Machine Learning concepts, modern AI methods, and research-oriented implementation practices
- Communicated ML concepts, experimental design, and model evaluation principles to students from varied technical backgrounds

Doctoral AI Researcher, People-Centred AI Institute (PAI), University of Surrey Oct 2022 – Sept 2024 – Guildford, UK

- Built knowledge distillation pipelines to train student networks to become more efficient feature extractors. The work used manual modification of the final feature layer in a ResNet50 as a baseline and compared outcomes against PCA, kPCA, LDA, plus knowledge distillation
- This novel approach, when applied to compress feature vectors from size 2048 down to 8, resulted in only a 1.39% decrease in mAP on a unimodal fine-grained image retrieval task, leading to a 256-fold reduction in

memory requirements for storing the embeddings

- Conducted additional research with the Journalism in AI group on public perceptions of ChatGPT-like tools on Twitter (X); paper currently resubmitted

Machine Learning Intern, Entropy.AI – Guildford, UK/Riyadh, Saudi Arabia Sept 2023 – April 2024

- Designed a pipeline to identify profitable medium- and long-term stock investments
- Analysed *fundamental* data from companies listed on the Saudi stock exchange (Tadawul)
- Developed a synthetic data generation method to overcome limited financial data, using four quarterly data points to simulate 10 years of quarterly data, including the COVID-19 downturn
- Built an ensemble of three classical ML models in Scikit-Learn, combining Linear Regression, Random Forest, and XGBoost via weighted averaging to predict annual returns across the Tadawul index

Systems Biology Researcher, University of Sheffield – Sheffield, UK May 2011 – June 2020

- Generated cell growth data and amino acid flux measurements using mammalian cell culture techniques and High-Performance Liquid Chromatography (HPLC) analysis
- Built and fine-tuned a large genome-scale metabolic network of recombinant CHO cell metabolism using these wet lab experimental data
- Validated the 2300-reaction network against published models and open-source gene and protein databases. Implemented the model using Systems Biology Markup Language (SBML), employing Flux Balance Analysis (FBA) for *in silico* flux predictions
- Integration of HPLC results, literature, and database annotations revealed substantial discrepancies in widely-used published metabolic models in the literature
- The work resulted in a set of guidelines towards standardising flux metabolic models

Education

University of Aberdeen, MSc in Artificial Intelligence with *Distinction* Sept 2020 – October 2021

- Graduation project: **Chameleon** – an AI-driven medical training tool for clinical history-taking, built with React.js, Django, Docker, Dialogflow (GCP), and DigitalOcean; developed with Aberdeen Medical School, published at **AAMAS 2022**, and evaluated with 10+ physicians and 50+ UK medical students, with 74% of users saying they would use it again. This demonstrated end-to-end AI product delivery across user research, stakeholder collaboration, deployment, and impact evaluation
- **Nutlify**: a rule-based Natural Language Generation (NLG) MVP to generate dietary insights from raw dietary data. The rules were built using the Arria NLG Platform. The product idea was ground-breaking at the time as no existing solutions filled this gap. Pioneered this concept in an unserved market as lead designer

University of Sheffield, MSc in Cognitive and Computational Neuroscience Sept 2008 – October 2009

- **Summer Project**: Developed a computational basal ganglia model using a modified Izhikevich spiking neuron model, simulating 2M+ neurons with ODE-based dopamine receptor dynamics and receptor-specific affinity differences.

Jordan University of Science and Technology, BSc in Biomedical Engineering Sept 1999 – December 2004

Publications

The Impact of ChatGPT on Employment: Topic Modeling and Sentiment Analysis. Computers in Human Behavior Reports, 2026, revised and resubmitted.

Chameleon-A Framework for Developing Conversational Agents for Medical Training Purposes. 21st International Conference on Autonomous Agents and Multiagent Systems **AAMAS**, 2022.

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Awards

- Best Presentation Award, Annual Research Conference – Department of Chemical and Biological Engineering, University of Sheffield (2015)
- Best Graduate Teaching Assistant (GTA) Award, Department of Chemical and Biological Engineering, Sheffield (2013/2014)