Saif Anwar - PhD, Computer Science

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EDUCATION

PhD, Computer Science - Explainable AI and Transparent Machine Learning

University of Warwick, Funded by TRL Ltd. October 2021 – Expected April 2025

- Research focus in **explainability of black-box AI models** for responsible and safe AI usage in high-risk sectors such as finance, healthcare and transport.
- Implement full ML research pipelines from data scraping and cleaning to **large-scale model training and optimising on HPC clusters**.
- Developing novel methods to understand the predictive reasoning of complex **spatial and temporal forecasting models** to optimise behaviour for all mnodel types from classical machine learning methods (SVMs, Multi-Variate Regressions) to recent state-of-the-art deep learning models (Temporal-GNNs, Transformers).
- Presentation and publication of research at university, conferences, industrial partners which required conveying of complex topics to more general audiences.

MEng, Computer Science & Electronics (First Class Honours)

University of Bristol September 2017 – June 2021

- Relevant Modules: Data Structures & Algorithms; Symbols, Patterns & Signals; Machine Learning; High Performance Computing; Image Processing & Computer Vision; Applied Deep Learning; Information Processing & the Brain; Robotics Systems.
- Bachelors Dissertation: *"Adaptive Communication Reduction for Federated Machine Learning"*.
- Masters Dissertation: *"A Graphical Simulation & Routing Protocol for Intersatellite Network Constellations"*.
- Participated in multiple **hackathons and coding competitions** including: Google Hashcode (developing and optimising reccommender system models), Arm Make-a-Thon (developed and built an automatic pet feeder using computer vision) and G-Research coding challenges.

A-Levels

Loreto Sixth Form College September 2015 – June 2017 Manchester, UK

- Maths (A*), Further Maths (A), Physics (B)

EXPERIENCE

Machine Learning & Data Science Consultant

Freelance July 2021 - Present

- Led, initiated and completed multiple ML and Data Science projects for a number of clients including:
  - Data cleaning and predictive modelling for oil and gas markets. Developed a **visualisation dashboard using Django** to present model findings clearly, with deployment on Heroku.
  - Custom **Speech-to-Text tool using Google S2T API** to extract clips from extensive video libraries, with a purpose-built tool for client to be able to interact with models and data.

Senior Graduate Teaching Assistant

University of Warwick October 2021 - March 2025 Coventry, UK

- Involved with **teaching, marking and module organisation** of a range of computer science modules including, Introduction to Artificial Intelligence (2nd Year), Image & Video Analysis (4th year/Postgraduate), Data Mining (4th year/Postgraduate) and Data Visualisation (Degree Apprenticeship).
- Achieved high level of student satisfaction throughout all modules, while maintaining strict organisation and rigour towards academic standards and protocol.

Machine Learning Researcher

Toshiba Research Europe Ltd. February 2020 – September 2021 Bristol, UK

- Led and conducted research in improving efficiency of **decentralised federated machine learning systems**, whilst meeting strict deliverable deadlines.
- Designed and developed novel machine learning architectures using **PyTorch and Tensorflow** and deployed within a **distributed AI architecture** to evaluate performance gains.
- Filed multiple patents to protect state-of-the art algorithms with significant value, and subsequently published the related research in a prestigious Q1-ranked journal, further contributing to the company's intellectual property and industry recognition.

Quantum Communications Researcher

University of Bristol June 2021 – September 2021 Bristol, UK

- Developed a geographically and physically accurate **simulation software for satellite constellations** such as Starlink and developed novel network routing algorithms for such constellations as a tool for optimising global low-latency network communication.
- Collaborated with an international group of researchers to develop **cryptography techniques (Quantum Key Distribution)** within satellite constellations for secure message communication, which resulted in the publication of **multiple papers in journals and conferences**.

PUBLICATIONS & PATENTS

- Full list of publications can be found on Google Scholar.
- "MASALA: Model-Agnostic Surrogate Explanations by Locality Adaptation" ***ACM KDD 2024***. *Barcelona, Spain.*
- "Selective Updates and Adaptive Masking for Communication-Efficient Federated Learning," in ***IEEE*** *Transactions on Green Communications and Networking.*
- "CHILLI : a data context-aware perturbation method for XAI" *40th International Conference for Machine Learning (**ICML**) 2023. Honolulu, Hawaii.*
- System and Method for Selective Updates / Adaptive Compression in Federated Learning. - US20220156574A1 / US20220156633A1
- Contribution to open-source repositories such as LibCity, as well as provision of source code for developed novel methods.

SKILLS & LANGUAGES

Machine Learning | Artificial Intelligence | Deep Learning & Neural Networks | Data Science | Interpretable ML | Statistics & Probability | Linear Algebra | Python | PyTorch & Tensorflow | Pandas | NumPy | Scikit-Learn | OpenCV | Azure | AWS | C++ | Django | Git | SQL