SAIF ANWAR

PhD, Computer Science (March 2025)

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EDUCATION

PhD, Computer Science - Explainable AI and Transparent Machine Learning

University of Warwick, Funded by TRL Ltd. October 2021 – Expected March 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.
- Developing novel methods to understand the predictive reasoning of complex spatial and temporal forecasting models to optimise behaviour.
- Generating explanations for predictions for all types of predictive models from classical machine learning methods (SVMs, Multi-Variate Regressions) to recent state-of-the-art deep learning models (Temporal-GNNs, Transformers).
- Presentation of research at university, conferences, industrial partners which often 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.
- 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).
- Founder/President of Hip Hop Society, hosting multiple large scale events as well as being an active member of the Student Council.

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 XAI 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 | Pandas | NumPy | Scikit-Learn | OpenCV | Tensorflow | Plotly/Dash | C++ | Django | Git | SQL

English (Native) | Urdu (Fluent) | Punjabi (Fluent) | Hindi (Fluent)