Owais Siddiqi

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EDUCATION

Imperial College London   **Oct. 2022 – Oct. 2023**
MSc in Biomedical Engineering - Merit

- **Reinforcement Learning:** Explored advanced algorithms including Deep Q Networks (DQN), Proximal Policy Optimisation (PPO), Soft Actor Critic (SAC), Monte Carlo methods, Temporal Differences, and Dynamic Programming.
- **Statistics And Data Analysis:** Proficient in Markov Decision Processes, Bayesian Probability, and both Linear and Non-Linear Regression techniques.
- **Image Processing:** Mastered techniques such as Image Classification, Object Detection, Image Segmentation, Fourier Transformations, and the application of Neural Networks in image data.
- **Brain Machine Interfaces:** Acquired knowledge in Neural Decoding, Information Theory, Time Series Analysis, K-Nearest Neighbours, Naive Bayes Theorem, SVM, Random Forests, and Multi-Layer Perceptron's.
- **Mathematical Methods:** Developed a strong foundation in Graph Theory, Time Series Analysis, Data Visualisation Techniques (PCA, ICA, SVD), and Linear Algebra.

Queen Mary University of London   **Sept. 2019 – Sept. 2022**
BEng (Hons) in Biomedical Engineering – 1st Class

- **Mathematics and Computing for Engineers I & II:** Expertise in Calculus, Differential Equations, Sequences, EigenValues, Vectors, and Gaussian Elimination methods.
- **Vector Calculus for Engineering:** Strengthened skills in Multivariable Calculus, Linear Algebra, and Second Order Differential Equations.

WORK EXPERIENCE

PDUK ltd.   **Aug. 2023 – Jan. 2024**
Data Scientist Intern

- **Data Engineering:** Employed SQL queries to import, organise, and clean data in **MySQL**, resulting in a **25% reduction in data processing time**, ensuring comprehensive information retrieval on **3000+ customers, products and transactions**. Enhanced overall efficiency and improved data accessibility through streamlined processes.
- **Data Visualisation:** Employed Python tools such as **Pandas** for data visualisation, creating insightful charts and graphs with **Matplotlib** and **Seaborn**. Effectively communicated trends, patterns, and relationships within the data via reports, facilitating informed decision-making.
- **Predictive Modelling:** Leveraged advanced AI techniques, including transfer learning and pre-trained recurrent neural network (RNN) models within **PyTorch**, for predictive modelling. Adapted existing RNN architectures for time series forecasting of customer purchase history, resulting in a **20% improvement in forecast accuracy**, leading to a **10% reduction in inventory costs**.
- **Customer Segmentation:** Utilised K-means clustering with the Elbow Method to achieve optimal cluster determination for segmenting customers based on purchasing behaviour. This approach led to a **15% increase in conversion rates** through targeted marketing strategies tailored to distinct customer groups.

Imperial College London   **Mar. 2023 – Sept. 2023**
MSc Project

- **Bespoke Model Development**: Pioneered the creation of a cutting-edge, novel, end - to - end regression AI model using artificial microscopy data, revolutionising cell differentiation through deep learning. Resulted in an exceptional **80%+ accuracy** in seamless single stage cell quantification.
- **Data Management & Augmentation**: Optimised data preprocessing by implementing advanced methods, ensuring meticulous preparation of microscopy images for analysis. Implemented data augmentation techniques, which expanded the training dataset, resulting in a **30% increase in generalisation capabilities** and a **15% improvement in predictive accuracy**.
- **Tool Utilisation**: Led the seamless integration of a comprehensive toolset, featuring **Pandas**, **Matplotlib**, **OpenCV**, **TensorFlow**, **Keras**, and **NumPy**. This initiative optimised data preprocessing, parameter extraction, and model implementation, ensuring an efficient and effective workflow.

Imperial College London   Oct. 2022 – Dec. 2022

Reinforcement Learning Project:
- **Deep Reinforcement Learning**: Engineered the development and implementation of a state - of - the - art neural network algorithm for solving the pole balancing problem using **PyTorch**. Achieved optimal action prediction in a simulated environment, showcasing innovation and excellence.
- **State Space Exploration**: Conducted comprehensive state space exploration to derive a robust policy for long-term stability, ensuring the model's adaptability to various simulation scenarios.
- **Hyperparameter Optimisation**: Engaged in rigorous experimentation and fine-tuning of hyperparameters to optimise algorithm performance and achieve desired outcomes, **reducing training time by 20%** and enhancing overall efficiency.

Imperial College London   Oct. 2022 – Dec. 2022

Neural Data Analysis:
- **Data Decoding:** Utilised advanced libraries such as **Matplotlib**, **NetworkX**, and **SciPy** to decode and analyse complex neural data from mice, extracting meaningful insights from intricate datasets.
- **Noise Mitigation:** Spearheaded the successful identification and mitigation of data imperfections, tackling challenges such as noise and baseline fluctuations. Developing novel implementations of innovative techniques such as spike detection and preprocessing to ensure data integrity.
- **Visualisation Expertise:** Orchestrated the development of a diverse array of visualisation tools, including autocorrelation plots, recurrence plots, and raster grams, to present a comprehensive and insightful perspective on neural activity patterns.

Queen Mary University of London   Sept. 2021 – May. 2022

Third Year Project:
- **Fuzzy Modelling:** Led the charge in researching and implementing **ANFIS** combined with a bagging ensemble approach, crafting a sophisticated multi-class classifier for brain-machine interfaces. Achieved a remarkable 64% accuracy in classifying/predicting new **SSVEP** data using **MATLAB**.
- **Recognition & Presentation:** Secured a prestigious position among the **top 20% of engineering projects**, showcasing an innovative approach. Presented compelling findings at the annual Industrial Liaison Forum, garnering accolades for groundbreaking research.

Self-Taught   Nov. 2023 - Dec 2023

Student Stress Database
- **Data Analysis and Modelling:** Innovated the development of highly accurate stress classification models for student data, surpassing a **remarkable 96% accuracy** threshold. Applied cutting-edge **Random Forest** and **K-NN** algorithms via **PyTorch**, resulting in a significant advancement in predictive modelling capabilities.
- **Database Management:** Optimised database query operations using MySQL, resulting in a **10% reduction in data retrieval time**. Additionally, I streamlined data extraction processes, ensuring more accurate descriptive statistics and facilitating data-driven decision-making.

The Institute of Cancer Research   Jun. 2021 – Aug. 2021

Summer Intern:
- **Neural Network Development:** Led the development of a novel few-shot learning Siamese Network with a triplet loss function using **OpenCV**, **Keras**, and **TensorFlow**. Achieved a remarkable **70% accuracy score**, showcasing innovation and expertise.
- **Research Contribution:** Established the creation of an innovative imaging phantom, enabling independent experiments and generating valuable data and insights. Contributed significantly to the success of the research project, resulting in a **20% increase in experimental efficiency and data quality**.
- **Conference Presentation:** Authored and delivered a compelling presentation based on project findings at the prestigious ISMRM 2022 convention, garnering recognition for innovative research contributions.

Publications

Siddiqi, O., Winfield, J., Sormpas-Petridis, K., Harris, E., Ramkumar, A., Candito, A., Görner, S., Messiou, C., Blackledge, M., & Thrussell, I. (2022). Investigating the Repeatability of Multifrequency Magnetic Resonance Elastography applied to a Soft Gelatine Phantom. Presented as a digital poster at the ISMRM 31st Conference & Exhibition, Excel London, 7th – 12th May 2022.