Shayan Shafquat

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AI specialist with two years of expertise in fine-grained pattern recognition, engineering LLM security solutions and deploying ML models in transportation and e-commerce industries. Backed by a solid foundation in Applied Mathematics and Decision Neuroscience, I am currently developing and contributing to LLM-based applications.

Education

MSc. Computational Neuroscience, Cognition and AI — Sep 2024 | Nottingham, UK
University of Nottingham — Tentative Grade: Distinction

Integrated MSc. Mathematics and Computing — Jun 2020 | Kharagpur, IN
Indian Institute of Technology, Kharagpur — CGPA: 7.2 / 10.0

Work Experience

Enkrypt AI, Inc | AI Research Consultant (Part-Time, Remote) — Boston, US | Jun 2023 – Sep 2023

- Developed a **malicious file scanner** for python scripts and jupyter notebooks, focusing on securing the ML lifecycle
- Built a dataset for **prompt injection** and **backdoor attacks** to fine-tune LLMs for security and adversarial robustness
- Implemented demo-ready LLM security using **RAGAS** and **NeMo GuardRails** to counter toxicity, bias, and jailbreaks

ANI Technologies Private Limited (OLA) | Data Scientist — Bangalore, IN | Sep 2020 – Jan 2022

- **Pay after ride user identification**: Impact: Increased cashless ride by **5%** with no change in default rate (**2.5%**)
  - Enhanced the **feature store** API to analyze the behaviour of **15M+** users to establish trusted user base of 0.5M
  - Trained an **ensemble model** (balanced bagging classifier) on trusted users, achieving an **AUC score** of 0.91
  - Predicted default probabilities on **non-trusted** base, whitelisting **8.7M** users while maintaining the default rate
- **Improvements in peak pricing module**: Impact: Reduced conversion prediction error by **2.2%**
  - Developed a recency-weighted heuristic **fallback** model for peak pricing during outages, minimizing **loss**
  - Built and **deployed** a bike peak pricing module for bikes using spatiotemporal cab data and **regression** model
  - Maintained modules for **hotspot pricing** and in-trip cab inclusion in **supply signal**, with automated reporting
- **User level pricing**: Impact: **+1.5**% GMV/bookings and improved net completion during COVID-19
  - Automated user-specific coefficients from conversion rates via **cron jobs**, enhancing **demand signal** accuracy
  - Validated the hypothesis that abrupt fare changes cause regular **user churn** through a **control-test** study
- **Key collaborative contributions:**
  - **Traffic Lights Optimization:** Achieved an 18.3% reduction in wait times by optimizing traffic light signals with a Deep Q-learning RL agent in the SUMO simulation, effectively minimizing congestion
  - **System:** Enhanced the in-house utility package, streamlining data preprocessing and retrieval from **AWS S3**

ANI Technologies Private Limited (OLA) | Research Engineer- Intern — Bangalore, IN | May 2019 - Jul 2019

- **Feature-engineered** partner's ride data, using **decision trees** to predict login hours and form homogenous cohorts
- **Optimized** incentives for each cohort independently, minimizing **burn** while considering constraints on login hour
- Conducted **A/B testing** in Pune and Kochi to validate and ensure the effectiveness of the incentive optimization

Technical Skills

Experience with: Python, C++, Git, AWS, Azure, Docker, Kubernetes, Streamlit, SQL, Linux, Bash, R, Hive, Spark, LaTeX, NEURON
Python Packges: Tensorflow, LangChain, LlamaIndex, Numpy, Pandas, Scipy, Sklearn, Scikit-learn, Seaborn, PyTorch, PyNeuroML, NLTK
Modelling: DQN, Dyna-Q, RAG, Transformers, RNN/LSTM/GRU, VAE, GANs, CNN, Gradient Boosting, Linear Regression, SVM

Projects

Stochastic models of exploration in patch foraging tasks May 2024 - Sep 2024
Guide: Prof. Mark Humphries | School of Psychology | University of Nottingham

- Simulated foraging behaviours with resource depletion models and compared leave time predictions to **MVT**
- Evaluating **stochastic action selection** algorithms like epsilon-greedy, mellowmax using human patch-foraging data

Neural Dynamics and Disease Modelling Oct 2023 - May 2024

- Extended a neural network model that simulated **Alzheimer**'s disease progression within evolving brain networks
- Recreated multiple-frequency brain model, simulating neural dynamics and analyzing **resting-state brain activity**
- Simulated UP/DOWN state dynamics during **NREM sleep** in rodent brains, analyzing neural stability and transitions

Machine Learning in Science | Coursework UoN | Oct 2023 - May 2024

- Developing 2D drone navigation with reinforcement learning
  - Tuned heuristic approaches and created a **discretized action space** for rapid movement and stable landing
  - Trained and evaluated **DQN**, **Q-learning** models on average steps taken, fuel consumption and average thrust
- Optimizing CNNs for real-time autonomous driving on AutoPicar
  - Developed **CNN** models using **transfer learning** for speed and angle prediction, addressing class imbalance
  - Enhanced model performance through data augmentation, **architectural modifications** and data collection
  - Deployed the **tensorflow lite** models on toy car with **TPU** and camera, testing on three tracks and 12 scenarios

Conversion of large-scale cortical models - INCF Google summer of Code 2022
Mentor: Prof. Padraig Gleeson, Ankur Sinha | UCL London

- Converted the channels, morphological and biophysical properties in L5 pyramidal cell from **NEURON** to **NeuroML**
- Implemented **GitHub Actions** to ensure the multi-compartmental cell model's behavior during development

AI Ethics and NLP Research | Self-Motivated IIT KGP | Dec 2018 - Feb 2020

- **Fairness-aware data representation**: Reimplemented the **iFair** framework, minimizing **utility and fairness loss**, improving fairness by 3% and 9% with a 7% and 1% accuracy trade-off on Census and German credit datasets
- **Rumour detection in tweets**: Utilized **one-hot encoding** on characters to represent both tweets and comments, trained a **CNN** on named entities, and classified using a **GRU**, achieving a 68% accuracy
- **Hyperpartisan News Detection**: Designed and evaluated a **self-attention model** for bias classification in the **SemEval 2019** competition, outperforming the benchmarks set by **HCAN** and **Empath** models

Relevant Coursework

- **Offline:**
  - Regression and Time series model
  - Data Structure and Algorithm
  - Neural Computation
  - Practical Biomedical Modelling
  - Object Oriented Systems Design
  - Stochastic Process
- **Online:**
  - Linear Algebra by Prof. Gilbert Strang
  - Statistics for Applications by Prof. Philippe Rigollet

Achievements

- Eligible to receive the **INSPIRE** scholarship by the Ministry of Science and Technology for the undergraduate study
- Gold winning LSTM model comparing India's top mutual fund houses in the Inter Hall **Data Analytics** 2018
- Achieved **99.5** percentile score among 0.2M students who appeared in the **JEE** Advance examination