

# Shayan Shafquat

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AI specialist with 2 years of expertise in fine-grained pattern recognition. Proficient in scaling LLM security solutions and deploying ML models in transportation and e-commerce industry. Supported by a solid foundation in Applied Mathematics and Decision Neuroscience. Currently developing an LLM-based research assistant to streamline the research process.

## Education

**MSc. Computational Neuroscience, Cognition and AI**  
UNIVERSITY OF NOTTINGHAM

Sep 2024 | Nottingham, UK  
TENTATIVE GRADE: DISTINCTION

**Integrated MSc. Mathematics and Computing**  
INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

Jun 2020 | Kharagpur, IN  
CGPA: 7.2 / 10.0

## Work Experience

**Enkrypt AI, Inc** | AI RESEARCH CONSULTANT

Boston, US (Remote) | Jun 2023 – Sep 2023

- Developed a **malicious file scanner** for python scripts and jupyter notebooks, focusing on securing the ML lifecycle
- Surveyed LLM security, emphasizing **prompt injection**, **backdoor attacks** and strategies for adversarial robustness
- Integrated **RAGAS**, **NeMo GuardRails** and **rebuff** into a package for future seamless LLM security and monetization

**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
- Collaborative key involvements:**
  - Traffic Lights Optimization:** Trained a Deep Q-learning RL agent in the SUMO environment using a reward function focusing on minimizing wait times and congestion, achieving an 18.3% reduction in wait times
  - System:** Enhanced the in-house **utility package** for data preprocessing, streamlining retrieval from **AWS S3**
  - Ola Foods (Grocery):** Developed a baseline model using item-based kNN, predicting next basket items
  - Tech Interviews:** Conducted coding, probability, and ML-based initial round of the hiring process in the team

**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 Packages:** 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

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### Stochastic models of exploration in patch foraging tasks

PRESENT

Master's Dissertation | Guide: Prof. Mark Humphries | 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

### Machine Learning in Science | COURSEWORK

University of Nottingham | 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. Pdraig Gleeson, Ankur Sinha | UCL London

- Converted the channels, morphological and biophysical properties in L5 pyramidal cell from **NEURON** to **NeuroML**
- Used **github actions** ensuring the integrity of the multi-compartmental cell model's behaviour during development

### iFair - AI and Ethics

FEBRUARY 2020

- Developed a **fairness-aware data representation** preserving individual similarity, focusing on gender and age
- Minimized the combined **utility** and **fairness loss**, applying the approach to Census and German credit datasets, resulting in a 3% and 9% increase in fairness with a corresponding 7% and 1% decrease in accuracy, respectively

### NLP-Focused Research Projects | SELF-MOTIVATED

IIT Kharagpur | Dec 2018 - May 2019

- **Rumour detection in tweets:** Guide: Prof. Pawan Goyal | Department of Computer Science
  - Transformed tweets and comments using **one-hot encoding** on each character to feed as input for the **CNN**
  - Trained a CNN with label as named entities using **entity tagger tool**, finally obtaining the pre-final learned layer
  - Classified tweets by sequentially parsing the pre-final layer of the tweet and comments onto the **GRU** model
- **Hyperpartisan News Detection** | Competition: SemEval 2019
  - Implemented **Hierarchical Convolutional Attention Networks** for classifying articles on 5 classes of biasness
  - Implemented **Empath** model which analyzes articles on **lexical categories** using them for feature engineering

## Relevant Coursework

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

## Achievements

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- 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
- Part of the Gold winning **Football** team in the Inter Hall Sports Championship for the year 2017 and 2019