

Adam Farooq

ASSISTANT PROFESSOR IN AI AND CS · MACHINE LEARNING ENGINEER

Doha, Qatar

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Education

Aston University

PHD. IN STATISTICAL MACHINE LEARNING

Birmingham, UK

Jul. 2018 - Jul. 2022

- Thesis title: “Modelling inference strategies and robust clustering topologies”
- During my PhD I proposed novel methods to infer and robustifying latent variable models that can be applied to clustering and dimensionality reduction. My work can be broken down into the following four topics: (1) Proposed a mixture model for discrete data which learns the dispersion of the observed data in a data-driven manner. (2) Proposed an approach to robustify the likelihood (within the Bayesian paradigm) of a model with respect to likelihood misspecification. (3) Proposed two discrete-continuous latent feature models which can be used for dimensionality reduction to assist in tasks such as exploratory analysis, preprocessing, data visualisation, and related tasks. (4) Proposed two novel efficient sampling schemes for discrete Bayesian nonparametric priors

Aston University

PG CERT IN FELLOWSHIP OF THE HIGHER EDUCATION ACADEMY

Birmingham, UK

Oct. 2022 - Mar. 2023

Aston University

BSC. IN MATHEMATICS WITH ECONOMICS

Birmingham, UK

Oct. 2014 - Jun. 2018

- First class award (83.62%)
- Leslie Wickett Senior Memorial Prize: Highest joint honors mark
- Departmental Project Prize: Best final year project “A latent feature probabilistic principal component analysis model”

Skills

Programming Python (including PyTorch and Tensorflow), R, SQL, and MATLAB

Software Power BI, AWS, Google Analytics, and MS Office

Machine Learning Deep Learning, Bayesian Statistics, Optimisation, and Time-Series

Experience

CUC - Ulster

ASSITANT PROFESSOR IN ARTIFICIAL INTELLIGENCE AND COMPUTER SCIENCE

Doha, Qatar

October. 2023 - Present

- Teaching various undergraduate modules within AI BEng and Computer Science BSc
- Running workshops on Artificial Intelligence for a variety of non-technical audiences
- Reserch lead on using AI for education for Doha British School

Zetica LTD.

FREELANCE MACHINE LEARNING ENGINEER

Oxford, UK

Mar. 2023 - Present

- Developed an algorithm to normalise and align images from different cameras. This reduced the parameter space significantly
- Developed a CNN architecture to improve object detection on railway track. Compared to the existing method: (1) The accuracy improved form 85% to 95%, (2) Reduced the computational cost 5 folds by utilising a GPU in the pipeline

Imperial College London

SENIOR TEACHING FELLOW

London, UK

May. 2023 - Oct. 2023

- Providing one-on-one Machine learning and AI training for 25 post-doctoral fellows (the Eric and Wendy Schmidt AI in Science Fellows)
- Managing the industrial internship programme for the Artificial Intelligence MSc. Successfully persuaded over 5 companies to get on board
- Responsible for various events at I-X: Organising bi-weekly seminar series, Chair of the local organising committee for an AI conference, and training courses

Aston University

TEACHING FELLOW

Birmingham, UK

Sep. 2021 - May. 2023

- Designed, and taught both undergraduate and postgraduate modules in the Department of Mathematics, Department of Computer Science, and Business School
- Successfully supervised both undergraduate and postgraduate students on the dissertations
- Led departmental initiatives for industrial collaboration with university

Aston University ERDF: THINK BEYOND DATA

Birmingham, UK

LEAD DATA SCIENTIST

Dec. 2021 - May. 2023

- Successfully lead a team of 4 in the research and development of machine learning techniques to predict human behaviour
- Successfully developed two efficient machine learning solutions: (1) Predicting human activity with **97%** accuracy, (2) Forecasting sales using Bayesian techniques which halved the error
- Utilised variable selection methods (such as PCA and Factor Analysis) to improve the computational speed of machine learning models by 5 times
- Utilised visual informatics to reduce time spent by management on looking at data. One proposal was to use 2 TSNE plots provided the "same information" as 30 scatter plots
- Set up a data analytics's dashboard using Power BI to forecast sales

Aston University

Birmingham, UK

TEACHING ASSISTANT

Sep. 2017 - Sep. 2021

- Assisting first and final year students in seminars for the module 'Introduction to MATLAB', 'Mathematical Algorithms', 'Mathematics for computing professionals', and 'Data Mining'
- Improved student satisfaction by contributing towards the planning of a module

University of Manchester

Manchester, UK

RESEARCH VISIT IN RATTRAY LAB

Sep. 2019 - Feb. 2020

- Successfully contributed with the group on clustering single-cell ATAC-Seq data
- Worked on Bayesian optimisation for Gaussian process latent variable models

TopCashback

Stafford, UK

SITE CONTENT EXECUTIVE PLACEMENT

Jun. 2016 - Jul. 2017

- Proposed the use of classical Machine Learning to predict "cashback elasticity of demand", which produced prediction that were **10** folds better than the existing method
- Used R with SQL and Google Analytics to automate weekly reporting, this reduced the time from **5** hours to **20** minutes
- Trained over 8 non-technical staff on how to use MS Excel for data analytics on a bi-weekly basis

SA Corporation

Birmingham, UK

JUNIOR DATA ANALYST

Jun. 2014 - May. 2016

- Automated weekly/monthly performance reports using SQL
- Used numerical optimisation algorithms to predict sales, this improved sales by **10%**

Publications

- **Farooq, A.**, Raykov, Y.P., Raykov, P. and Little, M.A., 2020. Controlling for sparsity in sparse factor analysis models: adaptive latent feature sharing for piecewise linear dimensionality reduction. arXiv preprint arXiv:2006.12369
- **Farooq, A.**, Raykov, Y.P., Evers, L. and Little, M.A., 2019. Adaptive probabilistic principal component analysis. arXiv preprint arXiv:1905.11010
- Iqbal, M., Baker, S.M., **Farooq, A.** and Rattray, M. Scaled Bernoulli Mixture Model for Clustering of Single-cell ATAC-seq Data

Awards

- | | | |
|------|---|------------------|
| 2022 | Winner: Inspiring Teacher , Aston Students' Union, Academic Awards 2022 | Birmingham, UK |
| 2021 | Winner: Best talk , ASTUTE, Technologies for the benefit of the urban citizen | Birmingham, UK |
| 2018 | Awarded: Four year PhD scholarship , Aston University School of Engineering and Applied Sciences in conjunction with Capgemini | Birmingham, UK |
| 2018 | Awarded: BNP@NeurIPS Travel Award , BNP@NeurIPS | Montreal, Canada |
| 2018 | Awarded: Leslie Wickett Senior Memorial Prize : Highest joint honors mark in the Mathematics department , Aston University | Birmingham, UK |
| 2018 | Awarded: Departmental Project Prize: Best final year project , Aston University School of Engineering and Applied Sciences in conjunction with Capgemini | Birmingham, UK |

Presentation

Advances in data science, University of Manchester

Manchester, UK

POSTER FOR <ROBUSTIFYING MIXTURE MODELS USING MAXIMUM MEAN DISCREPANCY>

Jul. 2021

- Introduced robustifying mixture models using maximum mean discrepancy

ASTUTE, Technologies for the benefit of the urban citizen

Birmingham, UK

SPOTLIGHT PRESENTATION AND POSTER FOR <CONTROLLING FOR SPARSITY IN SPARSE FACTOR ANALYSIS MODELS>

Jul. 2021

- Introduced Controlling for sparsity in sparse factor analysis models: adaptive latent feature sharing for piecewise linear dimensionality reduction
- Was awarded "Best Talk"

ISBA, Approximate and Flexible inference

Virtual

SPOTLIGHT PRESENTATION AND POSTER FOR <ACCURATELY TRAINING LATENT VARIABLE MODELS USING ASSUMPTION OF MISSPECIFICATION>

Jun. 2021

- Introduced Accurately training latent variable models using assumption of misspecification (spotlight and poster and poster

Advances in data science, University of Manchester

Manchester, UK

POSTER FOR <ADAPTIVE PROBABILISTIC PRINCIPAL COMPONENT ANALYSIS>

May. 2019

- Introduced Adaptive probabilistic principal component analysis

NeurIPS, BNP@NeurIPS Workshop

Montreal, Canada

SPOTLIGHT PRESENTATION AND POSTER FOR <ADAPTIVE PROBABILISTIC PRINCIPAL COMPONENT ANALYSIS>

Dec. 2018

- Introduced Adaptive probabilistic principal component analysis
- Was awarded the "BNP@NeurIPS Travel Award"