ZELLA BAIG

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Education

University of Oxford, Mansfield College - MSc Mathematical Modelling & Scientific Computing *2023*

Dissertation: Singular Spectrum Analysis for Time Series, working with BlackRock.

Projects:

- Adaptive Optimisation Algorithms: Analysis of recent ML algorithms with an application in house pricing.
- Computational Call Pricing: Examining a neural-network based call pricing algorithm.
- Image Recolourisation: Python GUI program to recolourise images using RKHS methods for the backend.
- Battery Modelling: Construction of a model to analyse battery degradation for electric vehicles.

Courses: Optimisation, Numerical Linear Algebra, Machine Learning, Models of Derivatives, Numerical Analysis

University of Oxford, St. Hilda's College - BA Physics (2.i) *2019 - 2022*

d'Overbroeck's Sixth Form *2016 - 2018*

Skills

Databases

- Worked with both graphical (neo4j) and traditional databases, using tools such as Cypher Query Language, Tableau, shellscript, awk, and sed

Data Science

- Python and MATLAB based numerical modelling (e.g. via RK4)
- Data analysis utilising Pandas, SciPy, and Jupyter in both experimental and non-experimental contexts
- Neural networks for option pricing predictions
- Analysis and implementation of optimisation methods for numerical methods and ML algorithms e.g. AdaLoss
- Machine learning and data cleaning using the Scikit-learn and XGBoost libraries to predict trade settlements
- Basic natural language processing (e.g. text sanitisation and topic modelling) using NLTK

Computing & Development

- Java in the context of creating JUnit tests (built with Maven) for FX trade spot and tenor behaviour, utilising the Mockito framework to supplement existing in-house infrastructure
- Jira and Confluence for team organisation
- Cucumber testing to deliver features via a BDD framework
- AWS Cloud Development Kit
- Version control with Git, Bitbucket
- Unix based operating systems (Linux, OpenBSD, Plan 9)

Experience

London Stock Exchange Group (Technology Intern with ForexClear, and RepoClear) *Jun 2022 - Aug 2022*

- Incorporated edge-case detection for trade rollovers on holidays
- Tested trade settlement behaviour within larger Java applications using both JUnit and Cucumber tests
- Utilised a BDD testing framework to incorporate these trade settlement tests
- Constructed a GUI using macros and VBA within Excel to automate data input to internal databases
- Aided the production of a machine learning model to predict trade failure utilising the XGBoost library
- Supported the initial migration to AWS CloudFormation, debugging and deploying the initial stacks
- Liased amongst departments and supported a pitch to initialise BDD testing amongst RepoClear development teams

Ditchley Foundation (Network Analysis Intern) *Jul 2021 - Aug 2021*

- Queried and analysed a neo4j graph database ($\sim$ 110K nodes) using Cypher Query Language alongside Python
- Drew out trends and within the database of people and presented them visually alongside my team
- Began topic modelling using on call notes within the database using the Gensim and NLTK libraries
- Conducted research into themes and roles of key figures for potential Ditchley Conferences

OxFizz (Widening Participation Intern) *Aug 2020*

- Created a month long research report on barriers for disadvantaged Oxbridge applicants with 2 other interns
- Conducted research through provider interviews and student questionnaires distributed to $\sim$ 500 students
- Investigated existing access provisioning and identified lacks therein, presenting these gaps graphically
- Provided recomendations for future access support programmes, bearing in mind resource constraints
- Outlined and began development of a long-term student roadmap resource for Oxbridge applications