

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: **series_scorer**: a Python package to denoise (via SSA) and cross-score similarity for multiple time series; **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.*

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

2019 - 2022

Skills

Data Science

- Python and MATLAB based numerical modelling (e.g. via RK4)
- Analysis and implementation of optimisation methods for numerical methods and ML algorithms e.g. AdaLoss
- Machine learning using the Scikit-learn, XGBoost, and custom-built libraries to e.g. predict trade settlements
- Denoising and spectrum analysis via PCA, SSA, and fourier modes for multivariate datasets

DevOps & Computing

- Java in enterprise high-throughput FX processing software, with testing using Cucumber, JUnit, AssertJ, Selenium
- Terraform with custom modules
- Orchestration with Kubernetes, Docker, Helm
- CI/CD using FluxCD, TeamCity
- Monitoring using VictoriaMetrics, Prometheus, Grafana
- Google Cloud Platform, focusing on Cloud Run, Kubernetes Engine, Pub/Sub, Cloudfunctions
- Automation scripting using Ansible, Shellscript, Python for e.g. streamlining developer workflows
- Unix based operating systems (Linux, OpenBSD, Plan 9)

Experience

SGX FX (Graduate)

Sep 2023 - Present

- Developed an entire save-to-deployment pipeline to parse NLP notebooks into FastAPI-based Python containerised applications used internally via API to parse FX trade rejections, incorporating cross-region networking, load scaling, end-to-end request tracking using Cloud Trace, performance testing, and automated NLP testing & model generation
- Developed framework using Terraform & GCP to automate SSL rotations internally
- Introduced various tools and scripts to aide developers (e.g. team-based slack alerting, KEDA-based autoscaling cutting weekend costs by 12%, new Helm charts for Redis-equipped applications), as well as provided general day-to-day support for DevOps related tasks
- Maintained & developed CI/CD pipeline including configuring a "one-click" cluster recreation layout, introduction of custom Terraform modules, TeamCity pipelines
- Collaborated with the internal Data Team to provide an administrative database collecting users & FX subscriptions for a new application, and provided various endpoints and custom internal tools for management
- Implemented a full monitoring stack utilising Prometheus, Thanos, VictoriaMetrics, Loki, & Grafana on Talos as part of a shift towards onprem kubernetes.
- Aided in developing & end-to-end testing a brand new on-prem Java based applications used for data monitoring, including the initial configuration and developer pipeline setup
- Developed various ansible scripts such as automating maintenance and deployment of hardware management using node_exporter or in strengthening cipher suites for onprem VMs, and implemented developer alerting for these scripts via GCP kubernetes-based solutions
- Supported general development of various internal tools used by developers to generate isolated "miniaturised" software stacks to test breaking changes

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