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
- 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 (DevOps Engineer) *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. KEDA-based autoscaling, new Helm charts for Redis-equipped applications), as well as provided general day-to-day support for DevOps related tasks
- Maintained & developed CI/CD pipelines using TeamCity, FluxCD, and other tools
- Introduced & maintained custom Terraform modules/forks
- 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 an full monitoring stack utilising tools such as Prometheus, Thanos, VictoriaMetrics, & Vector 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