Tabish Ali Rather

tabishrather7006@gmail.com ‖ +61 403 478 975 ‖ linkedin.com/in/BYLihUg3nm
github.com/tabishalirather
5/576 Glenferrie Road, Hawthorn VIC 3130, Australia

Education

Bachelor of Science in Applied Mathematics and Data Science   CGPA: 3.7/4
Swinburne University of Technology, Hawthorn   Expected Dec 2024

Work Experience

Research Scholar, Swinburne University of Technology Dec 2022 – Feb 2023

- Research Overview: Developed an algorithm for computing virial coefficients in hard particle systems, optimising computational efficiency by identifying and calculating only unique integrals among possible permutations.
- Approach: Utilised advanced graph theory and adjacency matrices to define integration limits based on particle interactions, enhancing the precision of molecular behaviour modelling and achieving significant reductions in redundant computations.
- Outcomes: Successfully reduced computation time by 81% by identifying unique permutations among over 5000 integrals. Click here to access details on the project.

Research Scholar, Swinburne University of Technology Dec 2023 – Jan 2024

- Research Overview: Investigated alternative selection criteria for ARIMA models, comparing the Hyndman-Khandakar algorithm with a new approach using Shapiro-Wilk, Ljung-Box, and t-tests for optimised simplicity and accuracy.
- Approach: Conducted research with Dr. Andriy Pototsky, employing custom R scripts to generate diverse stationary time-series datasets, applying systematic parameter refitting to minimise overfitting, and benchmarking models using rolling window cross-validation.
- Outcomes: Achieved a 15% reduction in RMSE compared to traditional methods, eliminated 40% more insignificant parameters. Click here to access details on the project.

Supervisor, Woolworths Hawthorn, Melbourne   May 2023 – Present

- Lead and manage the front-end team, ensuring efficient checkout operations and high levels of customer satisfaction.
- Oversee daily operations, including cash management, staff training, and coordination with other departments to resolve issues and maintain smooth workflows.

Projects

Stochastic Modelling with KANs Click to access project report

- Research Overview: Designed and implemented Kolmogorov-Arnold Networks (KANs) for modelling highly stochastic data, emphasising their interpretability and performance on highly stochastic datasets, using pyTorch for model development.
- Approach: Collaborated with a multi-disciplinary team, utilising historical stock market data, and engineered features to optimise predictive accuracy, benchmarking KANs against LSTM models.
- Outcomes: Achieved a clear framework for applying KANs in stochastic data forecasting, demonstrating how test losses compare to traditional LSTM models.

Awards & Scholarships

- Top 3 in Swinburne Integration Bee 2022 and 2023
- Vocational Research Scholarship, Swinburne University 2022 and 2023
- Vice-Chancellor's Excellence Scholarship, Swinburne University 2021-2024

Skills

- **Programming Languages:** R, Python, MATLAB, SQL, C#, C++
- **Libraries/Frameworks:** pandas, Matplotlib, NumPy, seaborn, R-forecast, TensorFlow, Scikit-learn, Py-torch
- **Databases:** MySQL, DynamoDB, NoSQL-DB, MongoDB
- **Tools/Software:** Git, SPSS, KNIME, LaTex
- **Operating Systems:** Linux, Raspberry PI OS, Windows

Volunteering & Leadership

Swinburne Mathematics Society

- Vice-President (Nov 2023 - Present)
  - Organise educational events and structured study sessions to provide additional academic support, mentoring students in complex topics.
- Treasurer (Nov 2022 - Nov 2023)
  - Managed budgets, secured funds, and optimised resources for club activities.

Swinburne Islamic Society

- President (Nov 2023 - Present):
  - Lead bi-weekly events, organise weekly classes, and strengthen community engagement on campus.
- Prayer Room Manager (Jul 2022 - Nov 2023):

   – Maintained a clean, organised, and respectful environment in the prayer room.

Swinburne Representative Council

- Undergraduate Representative (Nov 2023 - Present)
  – Advocate for students and collaborate with the relevant faculty members to ensure best outcomes for students

Languages

- **English**: Full Professional Proficiency
- **Urdu**: Professional Working Proficiency
- **Hindi**: Professional Working Proficiency
- **Kashmiri**: Native Proficiency
- **Arabic**: Beginner