AARON MACKENZIE MISQUITH

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Skills

- **High-Performance & Distributed Computing:** Parallel algorithm design in Apache Spark & Ray, HDFS, cluster optimization, scalable data pipelines
- **Algorithm Development & Optimization:** Evolutionary algorithms (PSO, GA, ACO, Glowworm), feature selection, mathematical optimization
- **Machine Learning & Forecasting:** Predictive modeling, anomaly detection, demand forecasting, scikit-learn, model evaluation
- **Data Engineering & Automation:** Python scripting (NumPy, Pandas), ETL processes, real-time data ingestion, task automation
- **Data Management:** performance tuning, relational database optimization
- **Quantitative Systems & Trading Automation:** Algorithmic trading, back-testing, risk modeling, real-time order execution using market APIs
- **Visualization & Reporting:** Interactive dashboards using Power BI and Matplotlib, performance metric tracking, KPI reporting
- **Tools & Workflow Management:** Git, GitHub, Agile methodologies, version control

Experience

Data Analyst **August 2024 - Current**
Bhoruka Power Corporation Limited,
Bengaluru, India

- Reduced monthly data reporting time by 65% by building Python-based ETL pipelines to automate the extraction and transformation of multi-source energy and financial datasets.
- Improved energy forecasting accuracy by 17% using ensemble ML models (Random Forest, XGBoost) trained on historical plant data for demand prediction and anomaly detection.
- Built executive-level dashboards in Power BI, leading to faster anomaly detection and decision-making across 4 energy plants
- Developed automated scripts to replace 100+ manual tasks per quarter, saving 25+ analyst hours monthly
- Responsible for end-to-end data analysis, dashboard creation, predictive modeling, query optimization, and workflow automation

Research Intern **February 2024 – July 2024**
Under Dr Simone Ludwig in North Dakota State University,
Fargo, North Dakota

- Developed and parallelized evolutionary algorithms (e.g., PSO, Glowworm Swarm, Genetic Algorithm, Ant Colony) using Apache Spark and HDFS for distributed optimization.
- Optimized Spark clusters for scalable high-performance computing.
- Designed and implemented 1 novel algorithm and 2 unique feature selection algorithms based on PSO.
- Applied evolutionary algorithms to benchmark problems like Schwefel and Ackley for optimization.
- Integrated traditional feature selection methods (12+) and machine learning techniques using NumPy, Pandas, and scikit- learn.

Research Assistant **September 2022 - April 2024**
Under Dr. Swarnalatha Ks,
Bangalore, Karnataka, India

- Developed an automated trading bot for executing trades based on predefined algorithms and real-time market data.
- Designed and optimized trading algorithms using technical indicators and statistical models for profitability and risk minimization.
- Conducted back-testing using TradersView with historical data to validate and optimize strategies. Integrated financial market APIs (e.g., Zerodha API, Alpaca API) for real-time data processing.
- Automated the trading process, including signal generation and order execution, for real-money trades.
- Implemented real-time performance monitoring and dynamic adjustments to enhance trading efficiency. Developed risk management protocols and a risk matrix model to ensure compliance and investment safety.

Education

Bachelor of Technology(B.Tech): Information Science and Engineering - NITTE MINAKSHI INSTITUTE OF TECHNOLOGY - Bangalore, India
September 2020 to August 2024

Publications

- Simone A Ludwig, Jamil Al-Sawwa, Aaron Mackenzie Misquith, "**Parallelization of the Bison Algorithm Applied to Data Classification**," MDPI Algorithms Journal. (**November 2024**)
- Sinha, S., Mackenzie, A., Nayak, U., Sridhar, A., "**Trading Auto-bot for Enhanced Financial Decision Making**," IEEE SSITCON 2024, DOI: 10.1109/SSITCON62437.2024.10796849. (**October 2024**)

Patent

Filed a patent for the "**Automated Trading Bot Workflow and Complexity Analysis**" with the Indian Office of Intellectual Property, Chennai. (Yet to be granted)

Conference

- **Trading Auto-bot for Enhanced Financial Decision Making:** Presented in 2024 First International Conference on Software, Systems and Information Technology (SSITCON)
- **Performance Benchmarking of Distributed Reinforcement Learning Algorithms:** A Case Study Using Spark and Ray - presented at BMSIT (**February 2025**).
- **Parallelizing Data Mining Algorithms for Fraud Detection in Large-Scale Transaction Datasets:** presented at MAHE (**March 2025**).

Achievements

- **Student Council President** (NITTE PU College 2019)
- **International B-plan Candidate** (held in Singapore 2022)
- **National B-plan runner-up** (held in IIT Bombay 2021)
- **Regional B-plan Winner** (held by LWT Bangalore 2021)
- **Amateur Scientist Runner-up** (National level under 18 robotics competition conducted by Infosys in PES University Bangalore 2015)

Minor Projects

Recipe Sharing Platform
- Full-Stack Development
- Built backend with MongoDB Atlas and frontend with JavaScript, Node.js, CSS, and HTML.
- Hosted locally on localhost:7077 for development and testing.

Drone Project
- Designed a drone using Arduino Uno, programmed in C++.

AR App for Demonstrating Exercise Form
- Created an AR app with Unity and Vuforia to show correct exercise form.
- Integrated 3D models and real-time motion tracking.

Personal Assistant
- Developed a virtual assistant using Python and GPT-4.
- Integrated Whisper for voice interaction and task automation.
- Tested against MD5, SHA-1, and bcrypt.

Simple Brute Force Attack and Dictionary Attack
- Created a Python brute force attack script for login systems.
- Developed a Python script for dictionary attacks.
- Utilized multithreading for efficiency.

Automated Subscription Manager (using Indian UPI System)
- Developed a subscription manager with UPI integration for recurring payments.
- Built backend with Node.js and Express, and frontend for user management.