Aaron Mackenzie Misquith

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Professional Summary

I am a problem solver, and nothing excites me more than finding innovative solutions to complex issues. Whether it's developing efficient algorithms, optimizing user experiences, or troubleshooting bugs, I am constantly honing my skills to deliver top-notch software solutions. I am seeking to use my superior knowledge of Social Media Marketing and my advanced Programming Skills to serve your research as a PHD student.

Skills

- Programming and Scripting: Proficient in Python, JavaScript, C++, Java for algorithm development, automation, and system programming.
- Distributed Systems: Expertise in Apache Spark and PySpark for parallelized computing, and Hadoop Distributed File System (HDFS) for large-scale data processing.
- Evolutionary Computing: Advanced knowledge of evolutionary algorithms including Particle Swarm Optimization, Glowworm Swarm Optimization, Bison Algorithm, Genetic Algorithm.
- Data Analysis and Machine Learning: Skilled in data manipulation, preprocessing, and modeling using NumPy, Pandas, and scikit-learn.
- Algorithm Design: Experience in designing and implementing unique optimization and feature selection algorithms for distributed systems.
- Embedded Systems: Proficient in microcontroller programming with Arduino Uno and integration of counter-rotating propellers for drone stabilization.
- Automation: Development of automated systems for subscription management using UPI integration and recurring payment processing.
- APIs and AI Integration: Zerodha API for trade execution, Whisper API used for voice interaction, and GPT-4 integration is used for virtual assistant functionalities.
- Parallel Computing: Expertise in implementing and optimizing distributed algorithms for scalable computational tasks.

Experience

Data Analyst — August 2024 - Current

Bhoruka Power Corporation Limited, Bengaluru, India

- Data Processing and Analysis: Extract, clean, and analyze operational and financial datasets to identify trends and insights for energy production optimization.
- Dashboard Creation: Develop interactive dashboards and reports using tools like Power BI or Tableau to visualize energy performance metrics and KPIs.
- Predictive Modeling: Implement machine learning models for energy demand forecasting, anomaly detection, and maintenance scheduling.
- SQL Query Optimization: Write and optimize SQL queries to efficiently retrieve and process large datasets from relational databases.
- Automation and Scripting: Build Python scripts or workflows to automate repetitive tasks like data extraction, transformation, and reporting.

Research Intern February 2024 - Current

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, Banglore, 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

Pre University: PCMB(Physics, Chemistry, Math, and Biology) - Nitte Pre University, Banglore,INDIA

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

Publications

- Simone A Ludwig, Jamil Al-Sawwa, Aaron Mackenzie Misquith, "**Parallelization of the Bison Algorithm Applied to Data Classification**," MDPI Algorithms Journal.
- 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.

Patent

Filed a patent for the "**Automated Trading Bot Workflow and Complexity Analysis**" with the Indian Office of Intellectual Property, Chennai.

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** – To be presented at BMSIT (February 2025).

- **Parallelizing Data Mining Algorithms for Fraud Detection in Large-Scale Transaction Datasets** – To be presented at MAHE (February 2025).

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++.
  - Implemented counter-rotating propellers for stability.
- **Simple Search Engine**
  - Developed a search engine using Python, Flask, BeautifulSoup, and Scrapy.
  - Integrated NoSQL database for indexed data storage.
- **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.
- **Simple Dictionary Attack**
  - Developed a Python script for dictionary attacks on hashed passwords.
  - Tested against MD5, SHA-1, and bcrypt.
- **Simple Brute Force Attack**
  - Created a Python brute force attack script for login systems.
  - 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.

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)