

Rethabile Mokoena

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EDUCATION

University Of Pretoria

Bachelor of Science in Computer Science

Pretoria, GT

Feb 2023 – Present

Tiisetsang High School

National Senior Certificate

Bethlehem, FS

2022

PROJECTS

Backend Engineer — Future Feed | <https://github.com/COS301-SE-2025/Future-Feed>

Jan 2025 – Present

- *EPI-USE Labs (COS 301 Capstone Project)*
- Tech stack: Java Spring Boot, PostgreSQL, WebSockets, LLM APIs (Gemini/ChatGPT), AWS, Docker, JWT
- Architected a scalable backend supporting 1,000+ concurrent users with <500ms feed-generation latency.
- Developed RESTful APIs for user management, post interactions, and AI bot integrations, reducing API costs by 40% through caching.
- Engineered a real-time WebSocket service for live updates and a rule-based feed system (user-defined weightings for topics/sources).
- Secured data using JWT authentication, input validation, and role-based access control.

Real-Time Auction System | <https://github.com/RethaMokoena/Auction-System>

Feb 2024 – Jun 2024

- Built a full-stack auction platform using **Node.js**, **Socket.io**, **PHP**, and **MySQL** to enable real-time bidding.
- Implemented secure user authentication with password hashing and login sessions.
- Designed automated auction state transitions between *Waiting*, *Active*, and *Closed* using scheduled logic.
- Developed a real-time bidding engine with WebSockets to deliver instant updates to all participants.
- Created an admin-side command-line dashboard to monitor and manage auctions and users.
- Built a responsive frontend with HTML5, CSS3, and JavaScript for intuitive user interaction.

Malicious URL Detection System | <https://github.com/RethaMokoena/Malicious-Detection-System> (Ongoing)

- Designed and implemented a machine learning pipeline in **Python** using **Scikit-learn** and **Pandas** to detect phishing and malicious URLs and emails.
- Developed an object-oriented framework with modular components: **URLFeatureExtractor**, **URLDatasetLoader**, and **MalwareURLModelTrainer** for maintainability and reuse.
- Preprocessed inconsistent CSV datasets and engineered handcrafted features (e.g., special characters, length, redirection flags) to convert raw URLs into meaningful vectors.
- Trained and evaluated a **Random Forest classifier**, achieving high accuracy on real-world phishing datasets.
- Integrated data validation, model persistence using **joblib**, and detailed evaluation metrics (classification reports, accuracy).
- Developing a Chrome extension to enable real-time detection and protection within the browser environment.

TECHNICAL SKILLS

Languages: Java, Python, C, C#, C++, SQL (PostgreSQL, MySQL), JavaScript, PHP, Bash, HTML5, CSS3, React, R, LaTeX

Frameworks & Platforms: Spring Boot, Node.js, Express.js, React, Flask, FastAPI, WordPress, JUnit, Material-UI, OpenGL, Socket.io, bootstrap

Developer Tools: Git, Docker, TravisCI, Postman, Swagger, Make, Maven, Gradle, VS Code, IntelliJ, PyCharm, Eclipse, NetBeans

Libraries & APIs: pandas, NumPy, Matplotlib, OpenAI API, Gemini API, JWT, WebSockets, OAuth2.0, REST, Socket.IO, OpenCV

Database Systems: PostgreSQL, MySQL, SQLite, MongoDB (basic)

Cloud & DevOps: Google Cloud Platform, AWS EC2/S3 (basic), NGINX, Apache2, GitHub Actions, WSL

Other Skills: UML Modeling, Object-Oriented Programming, Test-Driven Development, Agile (Scrum), Data Structures and Algorithms, Network Programming (TCP/IP, Sockets)