Eddie Mjiyakho

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EDUCATION

University of Cape Town **Jan 2021 – Nov 2024**
BSc Computer Sciences & Information Systems

- Coursework: Data structures, Databases, Parallel & Concurrency Programming, Computer Architecture & Mobile Design Development, Calculus & Linear Algebra, Discrete Mathematics, Operating Systems & Computer Networks, Advanced Software Design & Algorithms, Managerial Finance, Systems analysis & Design, Business Intelligence & Analytics, System Design & Development, I.T. Project Management, Electronic Commerce, Business Project Management & Enterprise Systems, Personal Financial Management.

PROJECTS

Network Performance Insights Platform

Project Description:

Developed a comprehensive platform for analyzing and visualizing network performance metrics across Africa. NPIP combined network performance monitoring, geospatial visualizations, and historical data analysis to deliver actionable insights into internet performance trends, anomalies, and regional disparities. The project leveraged BigQuery, PostgreSQL, and Django for efficient data processing and interactive dashboards.

Key Contributions:

Data Analysis & Visualization: Designed interactive dashboards to visualize metrics like latency, throughput, packet loss, and user satisfaction, enhancing decision-making for stakeholders.

Geospatial Mapping: Implemented geospatial visualizations with filtering capabilities to analyze network performance across regions.

Backend Development: Orchestrated data flow from MLAB to BigQuery, stored data in PostgreSQL, and serialized it into JSON for frontend consumption.

Frontend Integration: Built a responsive frontend using Django, HTML, and CSS, ensuring clear representation of data insights.

Agile Development: Led the team in iterative development cycles, utilized GitLab for version control and regression testing, and ensured timely delivery of project milestones.

Collaboration: Worked closely with the Communicator and Architect to ensure the system met design and stakeholder requirements.

Technologies Used:

Frontend: Django, HTML, CSS

Backend: Python, PostgreSQL, BigQuery

Visualization: Interactive charts and geospatial mapping

Development Tools: GitLab, Agile methodology

Network App

Project Description:

Developed a peer-to-peer chat application leveraging TCP and UDP sockets to facilitate reliable and secure communication. The project incorporated advanced features such as multi-threading and data privacy, ensuring efficient real-time messaging for multiple users.

Key Responsibilities:

Application Development: Designed and implemented a robust peer-to-peer architecture using Python and network programming principles.

Protocol Specification: Created detailed protocol definitions for message types and data transfer commands, ensuring seamless communication between users.

Concurrency & Performance: Utilized multi-threading to handle multiple concurrent connections, significantly improving system scalability and reliability.

Data Privacy: Integrated privacy features by encrypting messages and enforcing secure communication protocols.

Technologies Used:

Programming Language: Python

Networking Concepts: TCP/UDP sockets, multi-threading

Tools & Libraries: Python socket library, threading module

Phumla Kamnandi Hotels - Guest Booking System

Project Description:

Collaboratively developed a Guest Booking System for Phumla Kamnandi Hotels as part of an academic group project. The system featured functionalities for booking management, dynamic report generation, and real-time occupancy tracking. Designed and implemented object-oriented solutions and a relational database for secure and efficient operations.

Key Responsibilities:

Telephone Booking & Modifications: Implemented core functionalities for booking creation, modifications, and cancellations using C#.NET, ensuring robust error handling and validation rules.

User Interface Design: Designed user-friendly interfaces and modeled Interface Flow Diagrams to enhance the system's usability and workflow.

Dynamic Reporting: Built dynamic reporting tools to analyze occupancy levels and generate business insights, enabling data-driven decision-making.

Database Design & Maintenance: Designed and normalized a relational database to 3rd Normal Form (3NF), created a detailed data dictionary, and implemented secure data storage solutions.

Object-Oriented Programming: Utilized class diagrams, sequence diagrams, and domain models to develop reusable and maintainable code.

Testing & Validation: Drafted a comprehensive test plan with detailed test cases, ensuring the system met user requirements and maintained data integrity.

Technologies Used:

Frontend & Backend Development: C#.NET

Database Management: SQL Server, Relational Database Design (3NF)

Design Models: Class Diagrams, Sequence Diagrams, ERDs

Tools & Methodologies: Visual Studio, SDLC, Interface Flow Diagrams

Bar Management System

Project Description:

Developed a multi-threaded Java application simulating a bar environment where patrons place drink orders, and a barman fulfills them. The system utilized scheduling algorithms (FCFS and SJF) for order processing and recorded key performance metrics such as response time, waiting time, and throughput. The project was developed and executed on a Linux environment, leveraging its shell utilities for compilation, testing, and performance analysis.

Key Responsibilities:

Multi-threaded System Design: Created a simulation using Java threads to represent patrons and the barman, ensuring seamless and asynchronous order handling.

Scheduling Algorithms: Implemented First-Come-First Serve (FCFS) and Shortest Job First (SJF) scheduling algorithms to optimize order processing.

Synchronization Mechanisms: Ensured thread safety using synchronized blocks and AtomicBoolean variables, preventing race conditions and deadlocks.

Performance Metrics Recording: Designed a mechanism to log and analyze key performance metrics, including response time, waiting time, turnaround time, and throughput, enhancing the system's efficiency.

Linux Workflow: Automated compilation, execution, and testing using Linux commands and Makefile. Configured simulation parameters with shell scripts and optimized troubleshooting by analyzing logs and performance metrics with tools like grep and awk.

Technologies Used:

Programming Language: Java

Concurrency: Java threads, synchronized blocks, AtomicBoolean

EXPERIENCE

Information Systems Tutor **Jan 2023 – June 2024**

University of Cape Town

- Provide assistance with C# programming, .NET Windows Forms, and general programming.

- Grade assignments and tests and provide feedback to help students improve.

- Attend meetings with lecturers and fellow tutors to ensure everyone is on the same page.

- Facilitate online hotseats and interactive sessions aimed at helping students with workshops and exercises.

- Assist students with their projects to bring together everything they've learned throughout the semester.

SKILLS

- Java, Python, JavaScript, C#.NET Framework, Git, Agile, Databases, Teamwork, Communication, Problem Solving, Critical Thinking, Project Management.

EXTRACURRICULAR ACTIVITIES

Peer Mentor Promaths Alumni, University of Cape Town **Jan 2023 – Nov 2024**

- Provided academic guidance and mentorship to first-year Computer Sciences students, assisting with Java and Python assignments, coursework and exam preparation.

Hackathon Competitor **Jan 2024 – Nov 2024**

- Participated in university coding competitions, specializing in full-stack development and data science challenges.

References

Dirk Snyman (Information Systems Course Convener)

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Zainab Ruhwanya (Previous Information Systems Course Convener)

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