Ben van der Westhuizen
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Summary

Motivated third-year Computer Science student at the University of Stellenbosch with hands-on experience in software development, algorithm design, and data analysis. Skilled in Java, Python, C, and SQL, with a strong foundation in building scalable applications and solving computational problems. Actively involved in academic and personal projects involving lexical scanners, mathematical modeling, and automation tools.

Skills

Programming Languages: Java, Python, C, SQL, HTML, CSS
Tools & Frameworks: Linux, Vim/Neovim, Git, TCP Sockets, Multi-Threading, Bash, Object-Orientated Programming
Other: Data modeling, lexical analysis, algorithm implementation, problem-solving, linear programming
Soft Skills: Problem-Solving, Conflict Resolution, Technical Communication, Active listening, Team Collaboration, Critical Thinking

Education

IEB National Senior Certificate (NSC)
Curro Durbanville High School - Durbanville, South Africa
2019 - 2023
Top 10 in Overall Academics 2021 - 2023
Bachelor of Science, Computer Science
University of Stellenbosch — Stellenbosch, South Africa
2024 – 2026 | Currently in 3rd year (Final Year)

Projects

- **WISTL Compiler (2025)**
  - *Technologies Used:* C, Deterministic Finite Automata, Recursive-Descent Parsing, LL(1) Grammar, JVM
  - Developed a teaching compiler for the WISTL language in C, implementing a full pipeline including lexical analysis, recursive-descent parsing, semantic checks, and code generation targeting the JVM. Applied deterministic finite automata for scanning, recursive parsing for an LL(1) grammar, and symbol/type tables for semantic validation.

- **Quasi-Palindromic DNA Analysis Utility (2025)**
    - *Technologies Used:* Java, Algorithms, Data Structures, Caching
    - Built a Java program to search for and generate quasi-palindromic substrings in DNA sequences under user-defined constraints. Implemented efficient algorithms for palindrome checking, minimum-swap detection, and recursive sequence generation with caching, enabling scalable analysis of large DNA inputs.
- **Block Board Game (2024)**
    - *Technologies Used:* Python
    - Developed a two-player command-line board game in Python, implementing core game logic (piece movement, win conditions, turn management). Engineered a robust system for move validation and managed game state and scoring, with points awarded for moving pieces into designated "sinks" on the board.
- **Statera (2023)**
    - *Technologies Used:* Java, NetBeans IDE, Microsoft Access Database
    - Developed a comprehensive desktop application to help users balance professional and personal lives. Engineered a 'Focus Mode' to block distracting websites and an automated 'workaholic filter' for break prompts. Designed and implemented a multi-table Microsoft Access database for secure user accounts, a gamified point system, and blocked websites.
- **Personal Portfolio Website (Jan 2026 – Feb 2026)**
    - *Technologies Used:* HTML, CSS, JavaScript
    - Built a responsive personal portfolio website. Implemented a dynamic navigation system that allows switching between pages without reloading. Designed and styled for visual appeal and accessibility across different devices.
- **Simple Messaging App (Feb 2026)**
    - *Technologies Used:* Java, TCP Sockets, Multi-Threading, JavaFX
    - Designed and built the server-side of a real-time multi-user chat application for a third-year group project. Implemented a multi-threaded TCP server in Java to handle concurrent client connections, including a ClientHandler and ClientManager system for user management and message routing.
- **Stellenbosch University CS Department Website Redesign (DevSoc Hackathon 2026)**
    - *Technologies Used:* Next.js 14, Drupal 11 (headless JSON:API), Anthropic Claude API, Resend, Vercel
    - **Project:** Full redesign of the Stellenbosch University Computer Science Department website for the 2026 DevSoc Hackathon (team of three).
    - **Result:** A production-ready, multi-page site replacing cs.sun.ac.za.
    - **Highlights:**
        - AI-powered assistant (Anthropic Claude API) using live Drupal

content.
        - Incremental Static Regeneration (ISR) for CDN-level performance.
        - Interactive calendar with ICS export.
        - Real-time, unified site-wide search.
        - Pixel-perfect implementation of the Stellenbosch University Brand Manual.
    - **Live:** suhackathon.vercel.app