# Callum van Heerden

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## Work Experience

### Verishare Software (Junior Software Developer)

2021/05 – present

- **Telegram Chatbot**: I built a Telegram chatbot from scratch to production for debtors to be able to see their accounts, pay their balance using PayAt, create repayment plans and create debit orders, all without needing to talk to any humans. It has been utilized by nearly 400 distinct users to date.
  - Java, Spring Boot
  - Spring Statemachine
  - SQL Server and Stored Procedures for Statemachine session persistence and logging
  - Excel report generator for observability
  - E2E testing for the user flow
  - Reactive streams with Spring Reactive, WebFlux, Mono, used with Spring Statemachine and the TelegramBots library
  - Built a PlantUML chart exporter for the Statemachine diagrams
  - **Chatbot Frontend**: I also built a web-based frontend for the chatbot using React.js on the frontend, sharing the same Spring Statemachine backend. (Not in production yet)
- **Database as Code Project**: Worked on converting our largest database into an idempotent "database project" using SSDT (SQL Server Data Tools), which allows you to define your schema as code, allowing you to rebuild it from scratch and use source control to track changes over time. The project is about 90% complete so we have not yet made the migration. I created powershell scripts to parse ~4000 stored procedures to alter their format.
- **PayAt API integration**: I worked on upgrading a legacy SOAP integration with PayAt to their new REST API using Spring Boot, utilized an OpenAPI/Swagger Spring code generator
- **Business applications which I have worked on**:
  - VPS (VeriShare Process Service), which is a scheduling application for C#/dotnet applications, used for handover imports, payment imports, etc.
  - VeriWeb, which is a Java/Spring application for exposing and consuming APIs, we also use it for many other things like managing recurring card payments and our office dashboard monitoring tool.
  - VeriNet, which is a large desktop application built using Clarion and used by our agents when communicating with debtors.
  - I created and maintained many SQL Server stored procedures (where most of our business logic is stored), I also have a lot of experience with querying and joining data, as well as creating reports in SQL.
- **VeriCred Credit Bureau (VCCB) API integration**: Integrated with the VCCB API to retrieve personal data about certain debtors in VeriNet
- **VeriNet scripts using PowerShell**: Worked on improving the developer experience by heavily utilizing PowerShell scripts to compile VeriNet (which requires a 32-bit VM), it reduced the feedback loop during local development.
- **Voyc.ai development**: I worked on importing prediction data from a third-party integration called Voyc.ai; they converted our agent calls to text and tried to measure how well they followed their script, etc. I worked on screens in VeriNet which would show information about that data.
- **USA branch**: I worked on API integrations for our USA branch. I utilized the Merchant-E API and IntelliPay API for payment imports.

## Projects

- **Homelab - callumvh.com**: This is an overkill home infrastructure for learning about DevOps/GitOps concepts. I use the following technologies:
  - **Kubernetes** (K3S distro)
  - **Cloudflare tunnels** and **Traefik** as a reverse tunnel/proxy (to expose services to the internet)
  - **Flux CD** which is a "**GitOps** style" toolkit for Kubernetes deployments
  - **GitHub Actions** & Flux CD allow for a smooth CI/CD pipeline where the containers automatically get built and pushed to my container registry, flux cd automatically updates the Kubernetes cluster by changing the version in the source code via a bot.
  - I also have private services running on subdomains such as service1.callumvh.com, service2.callumvh.com, etc.
  - It contains a **personal website** and **blog** which are both still under development, created using Next.js Astro.js using the JAM stack, each running in their own container.
  - I would like to add dark launches, feature flagging, testing in production, canary launches, blue-green deployments, A/B testing, and so on.
- **Reddit clone**: I created a clone of Reddit.com using their API. I used Python and Flask to build the application; you could go to any subreddit and see all the popular posts, but it was read-only.
- **Nand2Tetris**: I have successfully completed the first part of the Nand to Tetris course, where I systematically built a computer platform from the ground up, this involved progressing through distinct layers of abstraction, starting with fundamental Boolean logic in Chapter 1, where I learned and implemented basic logical components using Nand gates. Subsequent chapters introduced more complexities, covering Boolean arithmetic, sequential logic, and machine language. The transition to understanding computer architecture in Chapter 5 involved implementing the Hack hardware platform based on specifications, while Chapter 6 delved into creating an assembler for translating assembly code to machine code. This process not only equipped me with hands-on experience in constructing a computer system but also provided a profound understanding of the underlying principles governing each abstraction layer. I learned many foundational concepts in computing along the way.
- **Interest calculator**: This is a simple interest calculator which was a tech-challenge required for landing my job at VeriShare
- **T Shirt Viewer**: This was a simple Vue.js project where you could design a t-shirt by uploading an image and placing it on the front & back of a t-shirt
- **CV**: This CV was created using Typst, which is a markup-based typesetting system and an alternative to LaTeX/MS Word for document creation. Here is the link to the repo: callumvh/cv

## Education

**Benoni High School** 2013 – 2017

Matric NSC - *Studied IT from Grade 10 - 12*

**UNISA (part-time)**

- *Diploma in Information Technology (discontinued to transition to BSc Computing)* 2020 – 2022
- *Higher Certificate in Mathematics and Statistics (one module left) (working towards BSc Computing)* 2020 – 2022
- *Bachelor of Science in Computing (not started yet)* 2024 –

## Interests

- Kubernetes
- Distributed Computing & Cloud Computing
- Database Management
- API Integrations
- Development Tools and Scripts
- DevOps/GitOps Concepts
- Statistics

- Home Infrastructure Projects
- Progressive Delivery
- Document Creation and Typesetting
- Continuous Learning and Technology Exploration