Jack Vermaak

Krefeld, Germany | jackdrcvermaak@gmail.com | linkedin.com/in/jack-vermaak | jackvermaak.com

PROFILE

I am an Infotronic Systems Engineering student at Hochschule Rhein-Waal in Germany, graduating in late 2027. Before university I spent two and a half years in Cape Town as a Workday ERP consultant. I currently run the website for a university student space and build data tools for an energy research project.

I am looking for a 20-week internship starting mid-February or early March 2027, in Cape Town or remote, ideally in embedded systems, software development or electronics. I am a South African citizen, so no work permit is needed in South Africa.

EXPERIENCE

Student Assistant, TransRegINT project, Hochschule Rhein-Waal — Apr 2026 - Present

Kamp-Lintfort, Germany, part-time

- Wrote Python tools, one using the Google Places API, that found over 500 companies in the region, from local PV installers to large firms, and collected their public contact details for the project's event invitations.
- Put together a workbook of German energy prices from 2016 to 2026 using public sources such as SMARD.
- Built a website that displays and compares the German energy price data (internal, not yet public).

Web Developer, Synapse student space, Hochschule Rhein-Waal — Sep 2025 - Present

Kamp-Lintfort, Germany, part-time

- Built and maintain synapse.nrw on TYPO3 v13 as the only developer, working with the university IT department on server access.
- Wrote a custom TYPO3 extension that applies Synapse's corporate design (fonts, colours, SVG graphics) across the site.
- Deploy updates over SSH with Composer, and host a separate static sub-site from a Git repository.

Reverse Logistics Associate, Amazon fulfilment centre (via GI Group) — Oct 2024 - Dec 2024

Krefeld, Germany, part-time

- Processed customer returns in Amazon's internal systems.
- Offered a 9-month contract extension at the end of the 3-month placement.

Functional Analyst / ERP Consultant, Virtual Resource — Feb 2020 - Aug 2022

Cape Town, South Africa, full-time

- Implemented and supported Workday HR and finance modules for large multinational clients, all of which now have market capitalisations of US$100 billion or more.
- Gathered requirements from client teams and wrote functional documentation.
- Wrote and ran test cases for rollouts and updates, and fixed data integration and reporting issues.

UNIVERSITY PROJECTS

Hydrogen Excavator Makeathon, Hochschule Rhein-Waal — Winter 2025/26

Team project, grade 1.3

- Cross-campus project converting a disused plug-in electric excavator to run off-grid on a 48 V LiFePO4 battery charged by a hydrogen fuel cell. I worked on the design phase in the four-person electrical engineering group, and the finished excavator ran successfully after the February 2026 build week.
- Chose the battery, external BMS and DC/DC converters linking the fuel cell, battery and 5 V control electronics.
- Designed the control platform: a Raspberry Pi hub connected to Arduinos over USB, with CAN bus links to the excavator's components. Safety shutdowns run on the Arduinos, so they keep working if the Pi fails.
- Presented the project to around 300 people at the university. A TransRegINT staff member involved in the project later offered me my current job.

Software-defined radio receiver, Communication Systems — Winter 2025/26

Grade 2.3, second highest of 18 students (12 failed)

- Built a software receiver in MATLAB for a 4-PAM signal that decoded three corrupted RF recordings into readable text with no visible symbol errors.

- Signal chain: IIR notch filters against narrowband interference, Costas loop carrier recovery, matched filtering, timing recovery, a decision-directed LMS equaliser and preamble-based frame synchronisation. I added per-frame polarity correction to fix the Costas loop's 180° phase ambiguity.

Forest fire spread simulation, Advanced Modelling and Simulation Summer 2025

Individual project, grade 2.0

- Built an interactive wildfire simulator in Python (NumPy, Matplotlib) based on a stochastic cellular automaton, with adjustable wind direction, firebreaks and click-to-ignite controls.
- Added a Monte Carlo forecast that runs 50 simulated futures and maps where the fire is most likely to spread.

Virtual reality card game, Innovative Technologies Summer 2024

Team project, grade 1.3 (highest in the class)

- Built a VR card duel game in a team of four, using Unity (C#) and Oculus XR. Players physically pick up and play cards against a computer opponent.

PERSONAL PROJECTS

Pico MixPad, USB audio controller for Windows 2026

Built and working

- Desk controller with 5 rotary encoders, 8 Cherry MX keys and an OLED display that sets Windows volume per application. Built on a Raspberry Pi Pico 2 (RP2350).
- Wrote the CircuitPython firmware. The pad shows up as a USB keyboard, media controller and serial port at the same time, so the basic controls work without any software installed.
- Wrote a Python desktop app that sets per-app volume through the Windows Core Audio API and talks to the pad over a serial protocol I designed, with a handshake and heartbeat. The app logic is covered by 11 pytest unit tests.
- Hand-wired the hardware and designed the parametric 3D-printable case in OpenSCAD.

Pico Latency Tester, click-to-photon latency measurement 2026

Built and working

- Measures the full delay from a mouse click to a change on screen, for comparing game and display settings. The device acts as a 1000 Hz USB mouse and reads a light sensor held against the monitor.
- Wrote the firmware in C++ with TinyUSB. I chose this over CircuitPython because its USB polling interval is fixed at 8 ms, which would add up to 8 ms of error to every sample.
- Each run takes 100 samples at random intervals so the clicks do not line up with the monitor's refresh. A Python tool logs every sample to CSV and reports the mean, median and spread.

EDUCATION

B.Sc. Infotronic Systems Engineering, Hochschule Rhein-Waal Sep 2022 - expected late 2027

Rhine-Waal University of Applied Sciences, Kamp-Lintfort, Germany, taught in English

- Current grade average 2.3, which is "gut" (good) on the German scale, where 1.0 is the best grade and 4.0 is a pass.
- Selected module results:

Machine Learning	2.0, highest grade in the class
Computer Networks	5th of 38
Physics	5th of 35
Higher Mathematics 2	8th of 57
Computer Science	10th of 64

SKILLS AND OTHER INFORMATION

Programming	Python, C++, C#, Java, PHP, HTML/CSS
Embedded	Raspberry Pi Pico 2 (RP2350), Arduino, Raspberry Pi, CircuitPython, TinyUSB, USB HID, I2C
Web and tools	TYPO3, Git, Linux over SSH, pytest, Unity, Claude Code
Engineering tools	MATLAB, Simulink, OpenSCAD, NumPy, Matplotlib
Business systems	Workday (HR and finance), Excel
Languages	English (native), German (B2 reading and comprehension, A2 speaking)
Driver's licence	South African
Interests	Bouldering for 12 years, with several outdoor ascents of V11 (8A)