

Harry Kituyi Wakuloba

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Summary

Software engineer with an MSc in Computer Science and a background spanning formal verification, compilers and tensor computation, and production backend systems. I build [Eincalc](#), a tensor-oriented spreadsheet that compiles einsum expressions, and I maintain [Fungi](#), a persistent graph library for OCaml. I want to move into empirical AI safety research, bringing formal methods, careful engineering, and open-source experience to it.

Experience

Freelance Software Engineer — Foodji *Munich, Germany (Remote) · 2022 – 2024*

- Built an onboarding and diagnostics-collection service for a fleet of vending machines.
- Developed a query-ranking service for MongoDB Atlas instances using the database profiler, surfacing the most expensive queries.
- Streamed query analytics from MongoDB into a time-series database for performance analysis.
- Implemented a camera-capture system to detect completed and failed vends.
- *Technologies:* Rust, Go, AWS, MongoDB, SQLite, React, AngularJS. *Reference available on request.*

Software Engineering Assistant — Upwork (Freelance) *Perth, WA, Australia (Remote) · 2020 – 2022*

- Collaborated on formal verification research involving parity games and the McNaughton–Zielonka algorithm (OCaml).
- Migrated the company CRM from HubSpot to Airtable.
- Integrated Slack and Gmail with internal software.
- *Technologies:* OCaml, Node.js, Vue.js, PHP, Google Cloud, Firebase. [Freelance profile](#).

Software Developer Intern — Opibus *Nairobi, Kenya · Sep 2019 – Feb 2020*

- Implemented software drivers to communicate with vehicle ECUs over the CAN bus protocol.
- Introduced CI/CD pipelines to reduce deployment friction.
- Maintained and upgraded software on remotely deployed devices.
- *Technologies:* C++11, Qt, CAN bus, Linux, GitLab CI.

Education

MSc Computer Science — Curtin University *Perth, WA, Australia · 2022*

- Coursework: Data Mining, Sensor Networks.
- Thesis project: Sensor fusion and SLAM for an aerial manipulator.

Selected Projects

Eincalc — Tensor-Oriented Spreadsheet (*OCaml, Svelte, Cloudflare*) harryk.dev/apps/eincalc

- A spreadsheet in which cells hold tensors and formulas are Einstein-summation (einsum) expressions.
- Parses and evaluates einsums with a single-pass, copy-and-patch compiler.

Fungi — Persistent Graph Library (Maintainer) (*OCaml*) github.com/kituyiharry/fungi

- A persistent (immutable) graph library for OCaml, published on opam. Earlier versions survive structural changes, unlike mutable alternatives, which suits research workloads.

CovPlot — COVID-19 Data Analysis (*Python, NumPy*) github.com/kituyiharry/covplot

- Analysed public COVID-19 case data and produced animated “flattening the curve” visualizations.

Skills

- **Languages:** Python, OCaml, Rust, Go, C++, JavaScript, Elixir
- **Formal Methods & Research:** Rocq (Coq) theorem prover, formal verification, sensor fusion and SLAM, data mining
- **Infrastructure & Data:** AWS, GCP, Cloudflare, Linux, PostgreSQL, MongoDB Atlas, SQLite
- **Tools:** Git, ROS (Noetic), MuJoCo, SocketCAN, Svelte 5
- **Other:** Experienced remote collaborator (GitLab Remote Work certification, 2020); bilingual in English and Swahili