

PATRICK KOTHBAUER

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AI Engineer · LLM evaluation and formal verification

SUMMARY

I build AI systems whose output can be checked: language models propose, provers and model checkers verify, and every claim is measured. First-year mathematics student at Chalmers/GU with an earlier B.Sc. in computational linguistics. Studying full-time; available part-time, hybrid from Gothenburg, or for a summer-2027 internship.

PROJECTS

RailCheck - generate-then-verify for a toy station (live) | Rust · React · AI API

- Tick five signalling rules; an LLM formalised each once (reviewed, then frozen); Foras proves each of the 32 rule sets safe, or returns the collision as an order of moves replayed on the board in 2D and 3D
- Each answer cross-checked by an independent brute-force search and re-proved live by a server API (~10–35 ms); 7 named properties per rule set, so the gap all five rules leave is shown
- Try it: labs.cryptopatrick.com/railcheck

Language, agents and numerical libraries | Rust · Go

- 34 crates on crates.io, incl. gf-core (Grammatical Framework runtime), JAX-RS (NumPy-style arrays, autodiff, WebGPU, 400+ tests) and AgentFS (agent workspace with a tool-call audit log)
- Ripley: benchmarks an LLM coding agent on a schedule (correctness, latency, token use)

EXPERIENCE

Independent Software Developer

2024 – 2025

Open source and financial markets

Remote

- Open-source Rust libraries (e.g. MiniFIX, FIX protocol); trading indicators for financial markets

Design Engineer & Project Coordinator

2007 – 2009

Semcon, Human-Machine Interface division

Gothenburg

- Owned the language-technology area; built HMI prototypes; lectured on AI and dialogue systems
- Co-coordinated HMI research with Volvo Cars and Chalmers that led to SEK 80M+ in VINNOVA funding

Founder, Swedish Chamber of Digital Currency Commerce (2015–18) · Media production startup co-founder (2009–14)

EDUCATION

B.Sc. Mathematics (in progress)

2026 –

Chalmers University of Technology & University of Gothenburg

Gothenburg

B.Sc. Computational Linguistics (AI focus)

2004 – 2007

University of Gothenburg

Gothenburg

- Logic, formal semantics, parsing algorithms, dialogue systems, neural networks

SKILLS

Programming: Python, Rust, TypeScript, SQL, Git, Linux, Docker

Languages: Swedish (native), English (fluent), French (fluent; lived a year in France)

AI engineering: LLM APIs (Claude), tool calling, MCP, evaluation and regression testing, audit logging

Formal methods: first-order logic, resolution, SAT/SMT (Z3), bounded model checking, inductive invariants