

Niklas Hall

AI engineer and research assistant

Frankfurt Rhine-Main, Germany
hall.niklas@pm.me
niklas-hall.com
linkedin.com/in/niklas-hall
github.com/Knaeckebrothero

I turn business problems into working AI systems. **Four years automating audit processes for cooperative banks** in the Genoverband group, **responsible for the generative-AI infrastructure at Frankfurt University of Applied Sciences** since 2024, and **creator of Superhuman Remote Worker**, a self-hosted AI workforce platform for companies: managed agents and interactive sessions with full audit trails and human approval, used by around 50 students and in first pilot projects.

EXPERIENCE

11/2025 – present
FULL-TIME SINCE 04/2026

Creator & Lead Engineer

Superhuman Remote Worker (SRW), an independent project and the latest of the AI tools I have built in my spare time since 2023, shaped by my experience in both academia and business.
`superhuman-remote-worker.com`

SRW is a managed-agents platform for all of an organisation's AI needs, from chat assistants to coding and autonomous agents. I conceived it, designed the architecture and built it end to end.

- **Architecture:** a FastAPI orchestrator for jobs, approvals and the audit trail; LangGraph agents in isolated Kubernetes workspaces; an Angular cockpit; PostgreSQL and pgvector, Neo4j for the knowledge graph, Keycloak for single sign-on, and an MCP server so coding agents can drive it.
- **Delivery:** a Helm chart with CI/CD on GitHub Actions, tests against throwaway databases and a single-VM installer. First public release in October 2026.
- **Way of working:** features start as design notes, AI coding agents do much of the implementation, every change is tested on a local k3d cluster, and Fleet deploys the development branch to a public dev cluster, where it is refined before a release.
- Used by around 50 students in two university research projects since the summer semester 2026. Pilot projects with a rehabilitation clinic group (phone voice agent and website chatbot) and a manufacturing company. Public on GitHub at `superhuman-remote-worker/srw`.

Python, FastAPI, LangGraph, MCP; Angular / TypeScript; PostgreSQL / pgvector, Neo4j; Kubernetes / KubeVirt, Helm

10/2024 – present
PART-TIME

Research Assistant

Frankfurt University of Applied Sciences

- Responsible for the university's generative-AI infrastructure: hardware procurement, installation, model deployment and monitoring.
- Build end-to-end chat agents for research projects; led development of a recycling-advice chatbot (publication pending).

12/2023 – 03/2026
PART-TIME

Working Student, Data Management

Genoverband e.V., auditing and advisory association for around 2,600 cooperatives, Neu-Isenburg

- **Automated the review of FinDAG reports to the banking supervisor.** Client banks submit signed balance sheets as PDFs. The application reads them with OCR, checks signature, date and signatory to match each sheet to its bank, extracts every value and reconciles it against the database. Auditors only had to step in when a value did not match, to resolve it with the bank. The manual check had taken **more than 50 working days** of auditor time.
- Worked with the auditors and IT to fit the application into daily work: reminders for the staff involved, integration with the data warehouse, the CMS and a service email account, and documentation.
- Built further Python analysis tools, including a sampling tool for anti-money-laundering (AML) checks and a market benchmark for agricultural cooperatives, and Power BI dashboards with complex data transformations.

Python, Streamlit, OpenCV, Tesseract OCR; MS SQL Server, SQLite, Power BI, VBA / Excel; Azure / Azure DevOps

10/2024 – 09/2025

Academic Tutor

Frankfurt University of Applied Sciences

- Research projects on HR-recruiting algorithms, RAG chatbots and knowledge bases, and the rollout of production RAG chatbots in small and medium-sized businesses.
- Organised a research project in which students built and launched a chatbot for a hotel; supervised seminar papers in business analytics.

Python, LangChain / LangGraph, n8n, RAG; machine learning, NLP, data science; MySQL, MongoDB, Neo4j

06/2022 – 11/2023
PART-TIME

Working Student, Software Development

AWADO Vertriebsberatung GmbH (FUTURE.LAB), a Genoverband subsidiary, Neu-Isenburg. Reference issued under my former name, Niklas Riel.

- Java / Spring Boot and MySQL back ends, then Angular front ends on the way to full-stack work.
- Helped establish DevOps routines and CI/CD pipelines.
- Produced an on-demand video webinar on RPA, and storyboards with AI-generated images.
- Co-designed a matching system for bank customers and financial advisers.

Python, Java / Spring Boot, Angular, MySQL; LLMs, TensorFlow, MATLAB; DevOps, RPA; Midjourney, DaVinci Resolve

PROJECTS

2025 – now

Fessi

Waste-disposal assistant for a university campus: tells students and staff which bin or collection point an item belongs in. A LangGraph agent over a Neo4j knowledge graph; the ETL pipeline that builds the graph from waste-disposal sources is the second repository. Began as a prototype from an earlier semester's project; I rebuilt it on Advanced LLM Chat, and my master's thesis is part of the effort to build and refine its knowledge graph.

Python, FastAPI, LangGraph; Angular / JavaScript, UI/UX design; vLLM, embeddings, NLP; Neo4j

`github.com/Knaeckebrothero/Fessi`
`github.com/Knaeckebrothero/Graph-ETL-Pipeline`

2025 – 2026

Literature Management

A collection of utilities I built for research work. The main one is a Streamlit app for AI-assisted systematic literature reviews: it imports papers and has a language model assess them against a review matrix. The Citation Engine is a library that makes an AI agent name a source for every claim, so the result can be checked, for use in other projects such as Superhuman Remote Worker and Advanced LLM Chat.

Python, Streamlit, LangChain; NLP, embeddings; SQLite, PostgreSQL / pgvector

`github.com/Knaeckebrothero/literature-management`
`github.com/Knaeckebrothero/CitationEngine`

2024 – now

HomeLab

The Kubernetes cluster this site runs on. Building it taught me networking, infrastructure, systems engineering and DevOps in practice. It has what a production setup has: separate network layers (a service network, on-demand VPN), high availability, distribution across sites, identity management, and enough headroom for family and friends as well as all my side projects, even the silly ones, like a live camera for the chickens.

Fedora CoreOS, K3s, KubeVirt; Rancher, Fleet, Helm; Longhorn, MinIO, Garage, CloudNativePG; MetalLB / BGP, Traefik, Cloudflare, WireGuard, Headscale; Vault, Keycloak, LUKS / Tang; ROCm, CUDA, llama.cpp

`github.com/Knaeckebrothero/HomeLab`

2024

Recruiting Algorithm

University research project (summer semester 2024): a prediction model to match employees and employers on skills as well as personality traits, built on web-scraped data with NLP and data-science tooling. My first research project as a student; the results led to my position as a tutor, and the need for a database and a host for the scrapers is how my home server began. Stalled for lack of funding and under strict data-privacy law.

Python, pandas, scikit-learn; machine learning, NLP; web scraping: Scrapy, Selenium

`github.com/Knaeckebrothero/Recruiting-Algorithm`

2023 – now

Advanced LLM Chat

Self-hosted LLM chat app and my first big side project: built to learn front-end and mobile development, then my proving ground for prompt engineering, RAG and context management. The first version ran front-end only on GitHub Pages, with the API key kept on the phone. For a research project on RAG systems I rebuilt it as a full messenger with a backend server; it then became the basis of Fessi's UI and gained a visual overhaul and agentic tool runs. Sidelined since SRW began. Next: the local-only mode again, with requests sent straight from the phone and the data stored and synced with end-to-end encryption, so it stays private even if the server is compromised.

Angular PWA / TypeScript, IndexedDB; Python, FastAPI, PostgreSQL, Neo4j; RAG, agents, MCP, prompt engineering, Whisper; OpenAI / Anthropic APIs, Helm

`ai.h4ll.net`
`github.com/Knaeckebrothero/Advanced-LLM-Chat`

SKILLS

AI	Large language models (open-weight and proprietary), agents, RAG and prompt engineering, knowledge graphs, machine learning, OCR and computer vision
Data	SQL and NoSQL databases, data modelling and warehousing, dashboards, data science and NLP
Engineering	Python, Java, TypeScript; web applications and APIs, requirements engineering, software project management, CI/CD, RPA; daily work with AI coding agents (Claude Code, Codex)
Infrastructure	Kubernetes, GitOps, containers, Linux and networking, on bare metal and in Azure; secrets management, encryption, single sign-on, audit trails and approval steps, GDPR
Delivery	From a manual process to a running AI system, with the business side: requirements to rollout
Languages	German (native), English (fluent)

EDUCATION

03/2025 – 02/2027
EXPECTED

M.Sc. Business Information Systems

Frankfurt University of Applied Sciences

Data-science-heavy programme, with digital transformation as the second part. Coursework completed, thesis in progress: *A Technique for Evaluating Knowledge-Graph Schema Fitness across Coverage, Populatability, and Queryability*, with Fessi as the case study.

08/2019 – 03/2025

B.Sc. Engineering Business Information Systems

Frankfurt University of Applied Sciences

Computer-science-heavy programme. Thesis: a systematic literature review of recent developments in neuro-symbolic AI.

08/2017 – 07/2018

Fachhochschulreife, computer science

Theodor-Heuss-Schule, Offenbach