

# Thomas Mages - Software Engineer

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Vienna but willing to relocate

## EDUCATION

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### Logic and Computation Msc. - TU Vienna

10/2024 – present

During my bachelor's, I already got the opportunity to attend Master's courses ahead of time to deepen my understanding in logic and program verification.

### Computer Science Bsc. - TU Vienna

10/2022 – 03/2025

**Beyond Rust's Ownership** My final thesis explored the limits of Rust's ownership system and its interactions with arena allocators/region-based memory management. I compared multiple implementations on flexibility, performance, and extensibility in both single and multi-threaded contexts. Special focus was laid on using modern approaches to static interior mutability paired with "Sync" arenas.

### Matura(honors) - HTL Spengergasse

09/2017 – 06/2022

## WORK EXPERIENCE

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### Software Architect / Engineer

07/2023 – 03/2024

*Fivesquare GmbH, (Part-time)*

*Linz, Austria*

- Leading part for both the architecture design and implementation of a document parsing pipeline and the corresponding "AI document chat" used by nearly 20 customer firms daily.
- Enabling efficient processing and embedding of even hard-to-parse documents like scanned PDFs with structured data such as tables.
- Involved integrating technologies such as Qdrant vector store, Celery task queue, and Fast API.
- Contributed to the [deepdoctection](#) framework.
- Was part of another architecture team where we had a consulting role for a customer, helping them design their SaaS architecture from the ground up.

### Algorithms and Data Structures Instructor

09/2022 – 06/2023

*WU Vienna, (Part-time)*

*Vienna, Austria*

- Led the practical part of the course, preparing and presenting material in English and German for up to 50 students.
- Guided the students during their hands on semester projects.

### Software Engineer

07/2019 – 07/2023

*FireStart GmbH, (Full-time)*

*Vienna, Austria*

- Started the development of a new cloud-based BPMN platform.
- After the initial part-time phase, I was involved in the end-to-end development of our innovative Business Process Management (BPMN) cloud platform full-time.
- Responsibilities covered implementing both intuitive user interfaces and event-driven microservices with scale in mind. Learned a lot being part of the architecture team and contributing to ADRs.
- Technologies: .NET / C#, Angular, Typescript, MongoDB, Event-Driven communication(Kafka), Azure

### Software Engineering Intern

07/2018 – 08/2018

*Novomatic AG*

*Gumpoldskirchen, Austria*

- Developed a TV tracking tool using Rust during my internship.

## PROJECTS

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### Gruenspan language

- Gruenspan is a Compiler + Runtime for my own simple language that features Rust-like syntax. It is itself fully written in Rust and incorporates both a simple AST interpreter and a Frontend that generates Bytecode and a Runtime (Backend) which executes the bytecode.
- Features all the basic language features expected, plus features first-class support for higher-order functions. Code generation optimizations like simple constant propagation are in the plans.

### **High performance table joins**

- Built a library for table (hash-)joining and learnt a lot about performance optimizations and benchmarking for various metrics. The project itself was written in Rust while benchmarking was done with criterion and perf.

### **WASM verification**

- In cooperation with TU, I've had the chance to help and work on static analysis for WebAssembly while reading numerous papers to get a deeper understanding of the security aspects of WASM.

### **Async Rust web playground**

- Utilized the Actix web framework to develop a web service, trying to get familiar with async Rust. Deploying on Google Cloud turned out to be challenging due to the extremely long Docker build times. Overcame these hurdles by employing Cargo Chef. The learning experience was great and inspired me to learn even more and look into server-side WASM and projects like Fermyon.

### **Vaikoon-Spengergasse**

- Part of the full development process for a project about predicting energy prices throughout Europe.
- The interface allowed users from partner firms to select specific regions in Europe, view historical energy prices, and visualize predicted price trends over time.
- Integrated data from Nord Pool and applied both TensorFlow machine learning and other statistical methods to the problem.

## **INTERESTS**

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**Programming Languages, Compilers and Logic** — My main interests at the moment range from compilers and all things performance to software verification and different logics. I also do a lot of research about the intricacies of the Rust programming language in my free time while working on small projects.

## **LANGUAGES**

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- German - native
- English - fluent