Krijn Doekemeijer

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Education

Vrije Universiteit Amsterdam and Universiteit van Amsterdam — Amsterdam, The Netherlands
Joint Masters degree in Computer Science, Big Data Engineering track. GA 8.9 — *Aug. 2020 – August 2022*

Utrecht University — Utrecht, The Netherlands
Bachelors degree in Computer Science and Game Technology. GA 8.6 — *Aug. 2017 – May 2020*

Research and publications

TropoDB: Design, Implementation and Evaluation of an Optimised KV-Store for NVMe Zoned Namespace Devices | *Master thesis* — February 2022 –

- TropoDB is the design, implementation and evaluation of an LSM-tree-based key-value store for NVMe Zoned Namespace Devices. See TropoDB.pdf and github.com/Krien/TropoDB for more information. It received a 9.5 as grade.

Key-Value Stores on Flash Storage Devices: A Survey | *Literature study* — January 2022 –

- A survey on how key-value stores are at the moment designed for flash storage devices, how they can optimised for flash storage devices and what role flash will play for key-value stores in the future. See arxiv.org/abs/2205.07975 for more information.

Experience

Developer for the Customer Experience (CX) team — Oktober 2020 – November 2021
Kaartje2Go, Working Talent — *Zwolle, The Netherlands*

- Analytics pipeline, Telemetry tooling, A/B test tooling
- DevOps tasks like AWS and CI/CD tasks
- Machine learning (genetic algorithms)
- Backend and Frontend (web development)

Derailed — September 2019 – January 2020
NS, ProRail, Utrecht University (bachelor thesis) — *Utrecht, The Netherlands*

- Developing a serious game in C# and *MonoGame* (game library) in a well-rounded team of 10 students
- Helped designing a graphical/logical simulation of the Dutch train network
- Created the UI framework for Derailed from the ground up using only Monogame
- Responsible for the software architecture and its design (also involves skills such as UML)

Projects

TropoDB | *C, C++, CMake, ZNS SSDs, Key-value store* — February 2022 –

- For my master thesis I implemented a key-value store directly on top of ZNS SSDs, known as *TropoDB*. This implementation is a modification of the state-of-the-art key-value store RocksDB. It does not use a file system and uses the *SZD* API to interface with the storage instead. SZD I made myself as well. See github.com/Krien/TropoDB.

Simple ZNS Device (SZD) | *C, C++, CMake, ZNS SSDs, SPDK* — February 2022 –

- *SZD* is an API built around the SPDK storage engine for ZNS SSDs. It uses an opinionated subset of SPDK, adds C++ support and comes with various default data structures (batteries included). SZD should simplify ZNS development. See github.com/Krien/SimpleZNSDevice.

File system for ZNS SSDs | *C, C++, CMake, ZNS SSDs* — November 2021 – December 2021

- For the university course "Storage Systems", I worked on building a file system on top of a *Flash Translation Layer* (FTL) made for ZNS devices. This file system was then tested and benchmarked with the key-value store RocksDB.

Flash Translation Layer (FTL) for ZNS SSDs | *C, C++, CMake, ZNS SSDs* November 2021 – November 2021

- For the university course "Storage Systems", I worked on building a *Flash Translation Layer* (FTL) directly on top of a ZNS device with the help of libnvme. Most of the project was written in C, with a bit of C++.

COVID-19 Twitter visualisation | *Python, Machine learning, NLP* November 2020 – December 2020

- For the university course "Web Data Processing", I worked with an enthusiastic team on a visualisation of the most important topics on Twitter during the COVID-19 pandemic for each country. For me, this mainly involved the topic modelling aspects (NLP, ML, Python).

COVID-19 Pollution map | *Spark, Python, Big Data* September 2020 – Oktober 2020

- For the university course "Large Scale Data Engineering", I worked with a team on a large scale data processing pipeline and visualisation tool of air pollution during the COVID-19 Pandemic. I focused on the data processing pipeline parts with Python, Apache Spark and DataBricks.

Haskell Shoot 'em up | *Haskell, game development* Oktober 2018 – November 2018

- I developed a Shoot 'em up game with Haskell and Gloss (graphics library) for the course "Functional programming". See github.com/Krien/Haskell.ShootEmUp.

Noxium | *Unity, C#, game development* November 2017 – Februari 2018

- Developing a 3d beat 'em up game in the game engine Unity with a team of 4. For this project, I created the AI, UI and I/O logic, menu and various multiplayer aspects of the game.

Technical Skills

Programming languages: Experience in C, C++, C#, Python, JavaScript, TypeScript, PHP, Haskell and R. Knowledgeable about various other languages such as RUST, Matlab, a few Lisp dialects and APL. Proficient in the "DSLs" Bash, HTML, SQL and LaTeX
Frameworks/Libraries: Among others SPDK, BPF, RocksDB, LevelDB, LightGBM, TensorFlow, NLTK, MPI, Google Analytics suite, MonoGame, Gloss, SDL, OpenGL, React, Cake, Symfony, Flask, Bokeh
Developer Tools: Git, Docker, QEMU, AWS, Kubernetes, Apache Spark, DataBricks, Linux, Windows, Unity, WSL, BPFTrace, perf, fio
General skills: Machine learning, CI/CD, virtualisation, software testing, software architecture, game development, scrum/agile