David Kräutmann

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Education

2017–2020 **M.Sc. Computer Science**, *RWTH Aachen University*.
Thesis: Automated analysis of termination arguments for Java programs [1]

2014–2017 **B.Sc. Computer Science**, *RWTH Aachen University*.
Thesis: Refining heap-shape information in Java using reachable types [2]

Work experience

2017–present **Consultant**, *self-employed*.
Consulting service in a variety of technical disciplines, primarily IT. Design and implementation guidance for Haskell and other IT projects. Engineering of prototype or one-off systems on request, e.g. cost-effective, reliable pond UVC disinfection; novel chlorine sensing methods; highly efficient ultrasound generators

2017–present **Technical co-founder**, *SimulaVR*.
Designed and implemented a VR window manager/compositor written in Haskell.
Wrote C/C++ bindings and Haskell OpenGL code, translated C++ architecture into Haskell architecture, and designed state-of-the-art game engine bindings

2016 **Research assistant (Verification)**, *RWTH Aachen*.
Developed a Scala-based tool for heap analysis of Java programs using Soot

2015–2016 **Developer/DevOps**, *StriveWire GmbH*, Hamburg.
Node.js backend developer role. Transitioned to DevOps duties after migrating our entire infrastructure to AWS for scalability reasons. Implemented much-needed monitoring tools (Sentry, AWS CloudWatch, Dynatrace).

2008–present **IT operations**, *Dan & L GmbH*, Mönchengladbach.
Planned and maintained a small-business IT infrastructure including: design and development of in-house tools according to business needs, VMWare/Windows/Linux system administration, Postgres database administration, and data transformation.

2015 **Teaching assistant (linear algebra)**, *RWTH Aachen*.
Teaching students in recitations and grading exercises and exams.

Languages

fluent English, German, Russian

Skills

Preferred Haskell

Known AWS, Postgres, C/C++, C#, Python, mathematical optimization, electrical engineering, ...

Basic Ansible, Coq, Rust, Scala, HTML, Shell, ...

Interests

CS-related Functional programming, mathematical optimization, high-performance computing, type theory

General Electrical engineering, organic chemistry

Open source contributions

- GHC [3] – multiple; see [4]

Personal projects

- WiFi-enabled 4-channel temperature sensor with logging—designed a custom PCB using a Raspberry Pi for connectivity, InfluxDB as timeseries DB, and Grafana for visualization [5]
- Created a solver to optimize a complex user-adjustable nonlinear model for players of the video game Final Fantasy 14 to maximize benefits gained from equipped items [6].

Coursework

- Seminar paper about integration of Satisfiability-modulo-theories (SMT) solvers into Coq [7]

Extracurricular work

- Taught Haskell via a self-organized workshop at RWTH Aachen

Links

1 David Kraeutmann. Automated analysis of termination arguments for Java programs. Master's thesis, RWTH Aachen University, 2020. `https://kane.cx/downloads/dkr_master_thesis_final.pdf`.

2 David Kraeutmann. Refining heap-shape information in Java programs using reachable types. Bachelor thesis, RWTH Aachen University, 2017. `https://kane.cx/downloads/dkr_thesis_final.pdf`.

3 Glasgow Haskell Compiler (GHC). `http://haskell.org/ghc`.

4 GHC commits. `https://github.com/ghc/ghc/commits/master?author=KaneTW`.

5 4-channel temperature sensor. `https://kane.cx/projects/pt100.html`.

6 FFXIV BiS solver. `https://github.com/KaneTW/FFXIVBisSolver`.

7 David Kraeutmann. Integration of SMT to Coq. Seminar paper, RWTH Aachen University, 2016. `https://kane.cx/downloads/smt_slides.pdf` `https://kane.cx/downloads/smt_paper.pdf`.