250 986 0250 | sandy@sandymaguire.me | Senior Software Engineer

SANDY MAGUIRE

"Impassioned by big ideas and systematic self-iteration."

SUMMARY OF SKILLS

Programming Experience

- C++ *(decade)*
- Haskell *(8 years)*
- C#, JavaScript, Lua, PHP, Python *(5 years)*
- Agda *(1 year)*

NOTABLE OPEN SOURCE WORK

Author » Cornelis January 2022 → ongoing

https://github.com/isovector/cornelis

- Built a tight integration engine between Neovim and Agda, allowing interactive proof assistance.

Author » Wingman for Haskell September 2020 → ongoing

https://github.com/haskell/haskell-language-server

- Developed an interactive tactic metaprogramming engine for Haskell, saving half an hour per day per developer of tedious programming tasks.
- Interfaced with the GHC API to provide robust, type-aware code synthesis.

Author / Maintainer » Polysemy February 2019 → February 2020

https://github.com/polysemy-research/polysemy

- Discovered a convenient encoding of an effect system based on higher-order free monads via simultaneous co-Yoneda and codensity transformations.
- Extended Haskell's typechecker to support ad-hoc functional dependencies when working with Polysemy, dramatically improving the developer experience.

WORK EXPERIENCE

Consultant » Wire October 2021 → ongoing

- Ported a 250k LOC codebase across an invasive library change.

Senior Software Engineer » Takt September 2016 → January 2018

- Led a team of four to reimplement a core subcomponent of the product – increased the cadence of new feature development from months to days.
- Directed a team of three to implement a high-throughput, low-latency brokered streaming library. Resulting library is slated to become the company's core interservice communication protocol.

Engineer (Identity and Access Management) » Google September 2015 → September 2016

- Led the architectural design effort of a user-defined permission model for the cloud – the team's only project for the next quarter.
- Took ownership over an unmaintained, service-critical internal compiler; improved compile times by 96% and test coverage by 65%.

Engineering Intern (Ads Ranking) » Facebook January → April 2014

- Analyzed the advertising platform's spending behaviors and subsequently implemented algorithmic changes resulting in a 0.5% revenue increase.
- Parallelized the backend graph ranker, resulting in site-wide response time gains of 0.4%.

PUBLICATIONS

Algebra-Driven Design
September 2020

algebradriven.design

- How to discover leak-free abstractions, and to automatically derive implementations.

Thinking with Types
October 2018

thinkingwithtypes.com

- Take yourself from a competent programmer to one whose compiler does the work for you.

How These Things Work
November 2017

reasonablypolymorphic.com/book/preface.html

- A technical and philosophical journey into how computers work, starting from first principles.

FORMAL EDUCATION

Honors Software Engineering
2010 → 2015

Bachelor of Software Engineering, University of Waterloo, ON

Relevant Courses

- Adaptive Search – stochastic means of approximating global maxima for chaotic functions
- Compilers – resulting Java compiler was most correct from class of 50 students
- Networking – socket programming; robust protocol design; routing principles
- Numerical Computation – computational error correction; solving differential equations

MISCELLANY

Interests

model checking, proof assistants, music, functional programming, compilers, robotics, electronics, math pedagogy