Jonathan Allen

Software Engineering

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Objective

Obtain a position in which I am able to mentor and be mentored in order to expand skills in software development, software architecture and mathematics.

Related Experience

2016 – present · **Senior Software Developer**, *RealTruck Inc.*, Fargo, ND.

Professional Software Development
- Enterprise systems design and architecture.
- Code review of both peer and junior developers.
- Author technical guidelines.
- Balancing technical considerations with quarterly and political constraints.
- Applying experience gained from open source development to proprietary systems.
- Quickly coming to grips with very large codebases.
- Apply mathematical experience to finding and fixing seemingly intractable software bugs.
- Engineer for failure and recovery, providing robust and highly resilient systems.

1985 – present · **Software Developer**.

A lifetime of non-professional software development.
- Breadth of experience crossing many paradigms and technologies.
- Ability to quickly learn and become adept at any "new" technology.
- Ability to evaluate best fit technologies, regardless of political or quarterly constraints.
- Evaluating long term value of technical decisions.

2014 – 2015 · **Teaching Assistant**, *North Dakota State University*, Fargo, ND.

Precalculus level algebra
- Prepare and present classroom material.
- Provide one-on-one assistance for my students.
- Grade homework, quizzes, exams, etc.

2002 – 2003 · **Programmer**, *North Dakota Center for Persons with Disabilities*, Minot, ND.

Miscellaneous programming tasks
- Diverse technology stacks consisting of C++, Win32 API, MFC, ASP, MSSQL, Oracle.
- Create and maintain desktop and web applications with a focus on accessibility software.

Skills

Expertise · C/C++ (and family), JavaScript, git, *nix

Current Focus · Elm, Haskell, Rust, Atmel AVR

Education

2015 · **North Dakota State University**, *Fargo, ND*.

Bachelor of Arts in Mathematics
- Elective credits in partial differential equations, combinatorics, graph theory and real analysis.
- Capstone explored numerical semigroups, Markov bases, and extensions of the natural numbers.

2001-2005 · **Minot State University**, *Minot, ND*.

Computer Science, Mathematics, Physics coursework
- Exempted from basic programming (C++) coursework.
- Completed all data structures and algorithms coursework.
- Completed a concentration in physics.

Technical Highlights

2017 Tomato Keyboard Kit, `https://ylixir.github.io/byatk`.
Managed production of a custom designed keyboard. Coordinated ordering custom circuit board, components and microcontrollers. Created documentation, and provided firmware.
- Languages: C
- Technologies: Embedded software, Gerber, electronics, Atmel AVR, cross compiling

2017 Sales tax system, `https://www.realtruck.com`.
Hardcoded taxe rates weren't scaling. Technical limitations of our platform forced me to write from scratch a custom SDK that integrated our platform with Avalara. Taxes are now calculated intelligently and dynamically.
- Languages: PHP
- Technologies: JSON, HTTPS, REST, fault injection

2017 Implement gift card system, `https://www.realtruck.com`.
- Languages: PHP
- Technologies: JSON, HTTPS, ADTs

2016 Complete redesign of ad feed system, `https://www.realtruck.com`.
Was put in charge of a system described as "the worst part of our codebase". Bugs in this system routinely caused the loss of tens of thousands of dollars. Maintaining, improving and testing this system while balancing time and priorities of other tasks, was described by management as a "master class in incremental improvement". The system can now be easily modified with little risk of side effects or failure, and can be plugged into arbitrary web technologies for consumption by advertising partners.
- Languages: PHP
- Technologies: Builders, dependency injection, composition, etc.

2016 yotp, `https://www.github.com/ylixir/yotp`.
Command line utility for generating one time passwords. Commonly called two factor authentication, this code could be used by a client or server.
- Languages: C#
- Technologies: .net core, Mono, .NET, HOTP, TOTP, SHA1

2015 diceware, `https://www.github.com/ylixir/diceware`.
Utility for generating passphrases. These are very secure passwords, which are easy to remember.
- Languages: Lua
- Technologies: diceware, /dev/urandom

2015 frobmask, `https://www.github.com/ylixir/frobmask`.
Automates computation of Frobenius numbers. Useful to mathematicians studying numerical semigroups.
- Languages: Lua 5.3
- Technologies: Abstract Algebra

2015 Lerna, `https://www.github.com/ylixir/lerna`.
Web browser with lua scripting support.
- Languages: Vala, Lua
- Technologies: GTK3, WebKit, liblua

2013 ArchNexus, `https://www.github.com/archnexus`.
GNU Linux distribution for tablet computers.
- Languages: sh, C
- Technologies: Linux, gcc, pacman

2010 – 2011 Yaed, `https://www.github.com/ylixir/yaed`.
Cross platform text editor. This was a successful excercise in documentation first, code second.
- Languages: C
- Technologies: GTK-2, GTK-3, GtkSourceView

2008 – 2011 yCurses, `https://www.github.com/ylixir/ycurses`.
Ncurses bindings for the D programming language.
- Languages: C, D
- Technologies: nCurses