Jonathan Allen

Mathematics and Software Development

P.O. Box 52
Fargo, ND 58107
802-552-0922
ylixir@gmail.com
https://github.com/ylixir
https://linkedin.com/in/ylixir

Objective

Obtain a position which leverages my skills in software development, software architecture and mathematics, where I can learn and grow both professionally and intellectually.

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 project explored numerical semigroups, Markov bases, and extensions of the natural numbers.

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

Computer Science, Mathematics, Physics coursework

- Met programming proficiency requirements.
- Completed all data structures and algorithms coursework.
- Completed a concentration in physics.

Skills

Expertise C/C++ (and family), sh, Lua, git, *nix

Current Focus Elm, Haskell, Rust, Atmel AVR

Related Experience

2016 – 2017 **Senior Software Developer**, *RealTruck Inc.*, Fargo, ND.

Professional Software Development

- Systems design and architecture.
- Code review of both peer and junior developers.
- Author technical guidelines.
- The ability to balance technical considerations with quarterly and political constraints.
- It so quickly became apparent how much of an asset experience in mathematics and open source software is that I was elevated to a senior level, despite being hired at a junior level.
- Ability to come up to speed with a nearly million line codebase in record time.
- The rigor and logic obtained from my mathematics experience allows me to find and fix bugs in days that other developers can not find in months.

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.

2003 – 2016 **Manager**, Minot/Fargo, ND.

Food Service

- Papa John's and McDonald's
- Food and inventory preparation and management.
- Employee and labor management.
- Cash management.
- Employee training.
- Customer service.

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

Miscellaneous programming tasks

- Use C++ and Win32 to maintain and create accessibility software.
- Use ASP to create and maintain web applications.
- Use SQL to interface with database back ends.
- Design and maintain databases using MSSQL and Oracle.

Technical Achievements

2017 **Sales tax system**, https://www.realtruck.com.

Completely reimplemented the sales tax handling for major e-commerce platform. When I came on board taxes were hardcoded in stored procedures in our database. Taxes are now handled dynamically and intelligently. I had to write a custom SDK for integration with Avalara from scratch because of the technical limitations of our platform.

- Languages: PHP
- Technologies: JSON, HTTPS

2017 **Implement gift card system**, https://www.realtruck.com.

Political and technical decisions left our platform with no ability to handle gift cards. I implemented gift card integration with lightrail.com which allows use of previously purchased cards, and the ability to create and use new cards.

- Languages: PHP
- Technologies: JSON, HTTPS, ADTs

2016 **Complete redesign of ad feed system**, https://www.realtruck.com.

Refactored a system that was literally unmaintainable. This system was so "legacy" that noone else was able to work with it. It was described to me as "the worst part of our codebase" and was so brittle that any modification would likely cause the loss of tens of thousands of dollars in revenue. My ability to maintain, improve and test this system while balancing time and priorities of other tasks, was described as a "master class in incremental improvement". Currently the system can be easily modified without risks of side effects, and can be plugged into arbitrary web api technologies.

- Languages: PHP

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

2016 **yotp**, https://www.github.com/ylixir/yotp.

Command line utility for generating one time passwords. These can be used, for example, to log into ones Facebook account after enabling two factor authentication. This code could also be used on the other end, by a web service to validate users using one time passwords.

- Languages: C#
- Technologies: .net core, Mono, .NET, HOTP, TOTP, SHA1

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.

Created 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 an interesting excercise in documentation first, code second, which worked out really well. This is the kind of thing I would love to see in a professional environment, but seems rare.

- Languages: C
- Technologies: GTK-2, GTK-3, GtkSourceView

2008 – 2011 **yCurses**, https://www.github.com/ylixir/ycurses.

Created ncurses bindings for the D programming language. To be honest the thing I learned from this project is to not be stingy with my work, and to welcome collaborators. Unfortanately this project wound up forked because I did not welcome assistance from people with more bandwidth than me.

- Languages: C, D
- Technologies: nCurses