


# Jonathan Allen

Software Engineering

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## Objective

Find an environment which challenges me to become a better engineer, mentor, and project architect.

## Skills

Expertise C/C++, JavaScript, TypeScript, Python, git, Linux, Node.js, SQL, NoSQL, REST  
Current Focus Elm, Lisp, Cloud DevOps, Arduino

## Related Experience

- 2016 – present **Senior Software Developer**, *RealTruck Inc.*, Fargo, ND.  
Professional Software Development
- Engineer enterprise systems for failure and recovery: provide robust and highly resilient systems.
  - Mentor, and lead to broader technical depth while balancing quarterly and political constraints.
  - Apply experience gained from open source development to proprietary systems.
  - Experience with codebases that are several hundreds of thousands of lines of code.
  - Broad background allows me to manage seemingly intractable issues.
- 2004 – 2013 **Food Service management.**  
Manager at McDonalds and Papa John's.
- Inventory: usage, loss, ordering, etc.
  - Employees: hiring, scheduling, training, discipline, etc.
  - Money: basic accounting, cash management, etc.
- 2014 – 2015 **Teaching Assistant**, *North Dakota State University*, Fargo, ND.  
Precalculus level algebra
- Prepare and present classroom material.
  - Provide one-on-one mentoring.
  - Objectively assess and provide feedback for work: 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.
- 1985 – present **Open Source and Hobby Software Developer.**  
Decades of software development experience.
- 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.

## References

- Jeffrey Barron **Software Engineering Manager**, ✉ [jeffrey.a.barron@icloud.com](mailto:jeffrey.a.barron@icloud.com).  
Jake Oster **Senior Software Engineer**, ✉ [jacoboster30@hotmail.com](mailto:jacoboster30@hotmail.com).

## 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 work involving numerical semigroups, Markov bases, and extensions of the natural numbers.

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## Technical Highlights

- 2019 **Media Metadata Cache**, <https://realtruck.com>.  
Microservice to provide cached metadata to website frontend.
  - Languages: Typescript, Node.js
  - Technologies: AWS, DynamoDB, Lambda Serverless, Microservices
- 2019 **Children's math practice**, <https://ylixir.io/math-quiz>.  
A simple flashcard like system to help a child memorize multiplication tables.
  - Languages: Elm, ElmUI
  - Technologies: Functional programming
- 2019 **Parser Combinator Library**, <https://ylixir.io/phap>.  
Implement parsing combinator technology, making it available to the PHP ecosystem.
  - Languages: PHP, Haskell
  - Technologies: Functional programming
- 2018 **Microservices product management backend**, <https://realtruck.com>.  
Redesign and implement large portions of a product information pipeline responsible for transforming and routing many millions of rows of data to tens of systems. Continue to maintain system over time. Uses multiple languages, and infrastructure systems in a microservices architecture.
  - Languages: Python, PHP, Go
  - Technologies: AWS, Circle-CI, Nix, Psalm, Bash, Make, Ansible
- 2018 **Shopping Cart**, <https://realtruck.com>.  
Helped to create the front-end for a shopping cart and checkout experience.
  - Languages: JavaScript, TypeScript
  - Technologies: Vue.js, Webpack, Rollup, Raven.js, Stylus
- 2017 **Tomato Keyboard Kit**, <https://ylixir.github.io/byatk>.  
Managed production of a custom designed keyboard. Created documentation, provided firmware.
  - Languages: C
  - Technologies: Embedded software, Gerber, electronics, Atmel AVR, cross compiling
- 2017 **Sales tax system**, <https://realtruck.com>.  
Legacy platform unable to conform to legal requirements. Provided custom SDK, allowing integration with modern services, allowing automated legal compliance.
  - Languages: PHP
  - Technologies: JSON, HTTPS, REST, fault injection
- 2017 **Implement gift card system**, <https://realtruck.com>.
  - Languages: PHP
  - Technologies: JSON, HTTPS, REST, discriminated unions
- 2016 **Complete redesign of ad feed system**, <https://realtruck.com>.  
Legacy system described as “the worst part of our codebase”. Too fragile to be safely modified, yet bugs routinely caused losses of tens of thousands of dollars. Modernized system while balancing time and priorities of other tasks. Described by management as a “master class in incremental improvement”.
  - 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 exercise 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