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SUMMARY

I am a bridge engineer seeking a more dynamic and creatively rewarding profession. I am ready to leverage my mathematical acuity and passion for programming to achieve my full potential with a career in data science.

EDUCATION

Master of Science in Civil Engineering University of Washington, Seattle 2015

- GPA: 3.87/4.0
- Selected Courses
  - Structural Mechanics (CEE 501) & Finite Element Methods (CEE 504)
    - Learned the theory of modern finite element analysis programs.
    - Created matrix systems of linear differential equations representing different types of structures.
    - Solved the matrices to reveal structural behavior.
  - Nonlinear Analysis of Structural Systems (CEE 506) & Materials Modeling (CEE 503)
    - Generalized CEE 501 and CEE 504 to include systems that change in time.
    - Changed the underlying equations to nonlinear partial differential equations.
    - Learned Runge-Kutta iterative techniques to solve these systems of equations.
  - Structural Dynamics (CEE 502)
    - Generalized the ideas of CEE 501 and 502 to include harmonic oscillation of structures.
    - Learned signal processing to get significant vibrational modes from earthquake data.
  - Engineering Computing (CEE 505)
    - Learned object oriented python in a formal setting focused on applications to structural engineering research. Topics included graph traversal, interacting with remote SQL databases, and basic GUI creation.

Bachelor of Science in Civil Engineering University of Washington, Seattle 2013

- GPA: 3.80/4.0
- Graduated Cum Laude
- Dean's list every quarter (except summer 2012 where credit load was insufficient)
- Selected Courses
  - MATH 124, 125, 126, 307 - Core calculus series and Differential Equations
  - CSE 142, 143, 373 - Introductory Programming Series + Data Structures & Algorithms
    - Java based introductory programming courses.
    - Learned control flow, variable scoping, object inheritance and abstraction, how to implement a variety of data structures, and how to do operational runtime analysis.
  - CSE 190 - Current Topics in CSE - Web Programming
    - Learned SQL as it relates to web technology
    - Learned to use a variety of client and server side web technologies including JavaScript, PHP, HTML, CSS, AJAX/JSON, and JQuery

PROFESSIONAL EXPERIENCE

Project Engineer , KPFF - Bridge Group ; Seattle 2016-Present

- Designed, analyzed, and produced contract drawings (as part of a team) for dozens of bridges ranging in scale from pedestrian boardwalks to the world's longest floating bridge.
- Created a VBA based tool to reduce human error and shorten time to run a common iterative analysis from two days down to one hour.
- Developed python based tool to move output from our most common bridge analysis software program into an SQLite database to speed post-processing of model results.
- Assessed the sinking risk associated with placing Light Rail across the I90 floating bridge.
  - Used in-situ data and model results to find deflections along the entire bridge length in a variety of possible damage states with various external loads acting upon it.
  - Created operational constraints on when light rail vehicles can be run across. Proposed bumpers at locations where a boat collision would result in the progressive sinking of the bridge.

Design Engineer , SSF Engineers ; Seattle 2015

- Designed and produced contract drawings for a variety of building structures including wood frame single family homes, container homes, apartment buildings, and treehouses.

RESEARCH EXPERIENCE

Review of Current Research Regarding Shear in Concrete Filled Steel Tubes - Prof. Dawn Lehman and Prof. Charles Roeder (Spring 2014)

- Reviewed existing research on shear failure in concrete filled steel tubes.
- Proposed simplified strength equation to fit results of existing testing. Verified equation using results produced using computer modeling methods.
- Proposed testing apparatus for large scale tests, 6 times larger than those in the literature.

Fatigue Testing of Welded Connections - Prof. Jeffrey Berman (Autumn 2012)

- Tested scale model welded connections for use in a California light rail system to determine the efficacy of a treatment meant to increase the fatigue life of welds.
- Performed statistical analysis to determine significance of results.

A Prototype Algorithm to Reverse-engineer Zooplankton Diets Based on Their Fatty Acid Composition - Prof. Michael Brett (Summer 2012)

- Wrote a MATLAB program which runs a Monte Carlo simulation to predict the diet of plankton based on their fat content with direction from Professor Brett
- Paper was presented by Professor Brett at 2012 ASLO conference in Japan
  - Abstract at: https://www.sgmeet.com/aslo/japan2012/viewabstract2.asp?AbstractID=9879

INVOLVEMENT

Webmaster ASCE (American Society of Civil Engineers) UW Chapter - 2012-2013

- Created and maintained website for the ASCE student chapter.
- Incorporated client and server side programming (JavaScript and PHP respectively).

Design Lead ASCE Steel Bridge Team - 2012-2013

- Designed a 1/20 scale steel bridge which was assembled and weight tested in competition.
- Advanced to compete in the national competition.
- Design included creation of computer structural models and creation of a MATLAB script that optimized for deflection to weight ratio.
- Developed innovative machined "pin" connection to increase build speed in competition.

PROGRAMMING EXPERIENCE

Java

- Learned Java in a formal classroom setting in the introductory series programming classes (CSE 142 & CSE 143). Continued use in Data Structures and Algorithms class (CSE 373).
- Know built in data structures, their run-time, inheritances, and how to implement them.

Python

- Taught myself python as an open source alternative to MATLAB.
- Used python extensively on civil engineering homework
- Formalized learning with object oriented python in "Engineering Computing" (CEE 505)

SQL

- Learned SQL in Web Programming (CSE 190), and Engineering Computing (CEE 505)
- Wrote a python program to export results of our most common engineering program to SQLite database for faster post-processing of model results.

Miscellaneous

- Explored PHP, CSS, HTML, AJAX/JSON, JavaScript, JQuery in Web Programming class.
- Taught myself Microsoft VBA to increase efficiency at work.