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Brian Rayburn

Employment

Independent Researcher

August 2023 - Current

- Designing and developing prototypes to enable communication across worldviews
- Researching philosophical and social psychological understanding of communication and language
- Examining artificial intelligence and knowledge graph tools to model relationships between worldviews

Founding Engineer : Life Lessons

Feb 2023 - August 2023

- Led design and development of base game abstractions that shifted lesson implementation from 6 months to as fast as a few hours and at most a few days
- Designed and implemented testing strategy for game client and backend server
- Implemented game components in Godot
- Designed and implemented a user server to manage authentication, authorization, and game session management in Python

Software Engineer Manager : Ellevation Education

February 2022 -September 2022

- Continued role as project Technical Lead
- Managed 2 direct reports, a new hire, and a long-term employee
- Implemented a program for non-engineer employees to interview to become entry level engineers after demonstrating sufficient skills as well as providing support for gaining those skills
- Received leadership coaching from professional engineering leadership coach

Senior Software Engineer : Ellevation Education

January 2020 - February 2022

- Technical Lead for project after 8 months
- Implemented analytics and software fixes to stabilize a flagship product under record usage
- Prepared iterative technical project plans with risks and off-ramps
- Developed toward those plans, programming in C#, JavaScript, and TypeScript
- Developed Terraform / Infrastructure code to deploy our software
- Team was responsible for maintaining legacy system through large-scale growth as well as building a new system to better operate at large-scale

Computer Scientist : New Sapience, Inc.

January 2016 - October 2019

- Built multi-platform desktop editor for proprietary data files using JavaScript, Electron, and React
- Built web chat interface for communication with chat engine
- Used Docker and Python to deploy an English syntax parser

- Designed a query language and built an engine for rapid exploration of large graph structures
- Built parsers for proprietary query language and data storage format
- Performed unit and integration tests of full-stack Electron app and web products
- Utlized Typescript and Flow in various projects

Front End Engineer : emocha Mobile Health Inc.

May 2015 - October 2015

- Built the web and mobile front end for a platform solution to medication adherence and linkage to care using JavaScript and Meteor.js
- Created server layers to store and pull data from internal APIs and shape data into a form expected by the front-end interfaces
- Implemented a video encryption and storage pipeline, connecting mobile devices through backend services to Amazon S3

Senior Software Engineer : First Mile Geo

November 2014 - February 2015

- Designed and built interactive, responsive web visualizations using JavaScript and D3.js
- Left due to unproductive work environment caused by lack of product direction

Lead Data Scientist : AHEAD Research Inc.

July 2013 - October 2014

- Built analytics infrastructure to both aggregate and visualize signals from a variety of existing sources (Google Analytics, Heroku DB etc), and to collect our own data (StatsD, MongoDB) to provide insights on site usage, experiment results, and typical users in real-time dashboards with JavaScript, Python, and Processing.js
- Designed and built a medication interaction and side effect checker using public data with Ruby on Rails
- Built various other features of Symcat.com including a profile completion module to incentivize customers to complete their profiles
- Added health data sets and ontologies to an internal knowledge graph
- Designed and implemented experiments to identify user demands
- Used parallel computation to examine user patterns in symptom reporting

Innovation Fellow : Jhpiego

July 2012 - July 2013

- Developed a fetal heart rate monitor for low-resource settings
- Refined algorithms for fetal heart rate extraction using Matlab
- Designed and implemented bench and clinical testing
- Created acoustic/haptic feedback from fetal heart signal

Research Internship : Johns Hopkins Applied Physics Laboratory through Oak Ridge Institute for Science and Education

June 2007 - June 2011

- Developed silica based all-optical switching technology
- Automated signal processing of atomic spectra for real-time experiment analysis in Matlab

Education

Complex Systems Science Intensive

New England Complex Systems Institute *Completed January 2024 earning a Certificate of Completion*

- Covered scale-free systems, fractals, chaos, system evolution, universality principle, system dynamics and more
- Contributed to a small group project using the language of complex system to describe Montessori education system

Social and Economic Networks: Models and Analysis

Stanford University *Completed July 2020 earning a Certificate of Completion*

- Learned methods for generating random graphs and a number of different graph metrics

Machine Learning

Stanford University *Completed Fall 2013 earning a Statement of Accomplishment*

- Learned about and constructed neural nets and other machine learning algorithms from sratch in Octave/Matlab

M.S. Bioengineering Innovation and Design

Johns Hopkins University Center for Bioengineering Innovation and Design *Graduated May 2012*

- Program specialized in the product development process from user need identification through commercialization

B.A. Physics

St. Mary's College of Maryland *Graduated May 2008*

- Took a large number of computer science and math classes

Projects

LED Costumes for Light City Festival 2017

- Designed and assisted construction of light up costumes that synchronized color with the scenes in the performance for the Fluid Movement, a community performance movement group in Baltimore, for their 2017 Light City performance
- Designed and constructed Arduino based RGB LED controllers for each costume
- Provided performance with real-time technical support

BrainSong: Auditory Neurofeedback

- Wrote software to connect with Neurosky Brain Computer Interface and generate an audio representation for real-time bioneurofeedback

eyeCandy: Collaborative Visuals

code repository

- Created platform to enable large groups of people to control projected visualizations
- Written in Python, JavaScript, and Processing

Teaching

- Workshop on Processing, May 2014 at Digital Harbor Tech Center, Baltimore, MD, during an after school program for high schoolers.
- Physics Tutoring, St. Mary's College, 2007-2008

Speaking

- Meteor.js, React & Dashboards, at CharmCityJS Meetup in Baltimore, MD, December, 2015
- Panel member at Social Impact of Open Data, hosted by Center For Data Innovation in Washington, DC, July, 2014
- Yale Unite for Sight Global Health Conference, BabyBeats Fetal Heart Rate Monitor, April 2012, New Haven, CT

Awards

- Akron Value Driven Engineering Conference, Grand Prize Case Study, BabyBeats Fetal Heart Rate Monitor, April 2012
- ASME iShow Finalist, BabyBeats Fetal Heart Rate Monitor, June 2012
- St. Mary's College of Maryland Mathematics Foundation 2006 Putnam Prize

Publications

- "All-Optical Computing Using the Zeno Effect," Johns Hopkins APL Technical Digest 2012. Winner of the Walter G. Berl Award for Outstanding Paper