Manfred·Cheung

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Education

Systems Design Engineering (Co-op) - Economics Minor • University of Waterloo — Honours Bachelor of Applied Science - 2020

Courses: Data Structures and Algorithms, Digital Computation (C/C++), Software Design (OO Design), Human Factors in Design, Digital Systems

Experience

Software Engineer • Uncharted Software — Nov 2020 - Present

- Designed and implemented a general purpose multithreaded JavaScript data storage and query system designed for **high performance** filter/search and capable of **linear thread scaling**, to make large-scale graph visualization and manipulation feasible in **real-time**
- Made a Vue component which permits intricate grid layouts to be easily specified with support for **continuous resizable grid elements**
- Developed and participated in the design of the ASKE HMI as part of the research team which won **Best Paper** in the Visual Analytics in Healthcare category at the **IEEE VIS 2021 conference**

Software Engineer • TekVision Technologies Inc. — May 2020 – Nov 2020

- Performed the **architectural design** and led the **development** of an entirely new reporting platform for IVR testing using Node, Express, GraphQL, and React interfacing with a legacy Oracle database, a **critical modernization project** for the company's competitiveness
- Designed and implemented multiple **interactive graphs** using ECharts while keeping usability standards and **load times under 300 ms**

Dash Front End Intern Engineer • Plotly — May 2019 – August 2019

- **Optimized** the Speck React component of dash-bio by **memoizing** expensive operations and **decoupling** Speck component updates from dash-bio with a debouncer and prop comparison functions to **maintain 60 fps** at all times running on reasonably powerful hardware
- **Made contributions** to the 3rd-party open-source library **ideogram.js** to fix issues such as **load race conditions**, **decrease frame times by over 26 ms** using layers to minimizing repaints on scroll, and draft a method to batch load large datasets to **prevent event loop blockage**
- On community request, **made dash-cytoscape responsive** by designing and implementing resize algorithms which automatically maintained the general size and position of the graph while accounting for any change in the browser window dimensions or aspect ratio
- **Evaluated 3rd-party plugins** for integration into dash-bio and dash-cytoscape by looking at compatibility, development time costs, and current needs, resulting in **2 new plugin additions**

Front End Engineering Intern • StackAdapt — Sep 2017 – Dec 2017, Sep 2018 - Dec 2018

- Served as the primary developer responsible for **incorporating the Zendesk ticketing system**, improving service and reducing operational costs by streamlining communication between customers and account managers as well as within the company
- **Consolidated** Zendesk and StackAdapt **authentication using single-sign-on (SSO)** by integrating Zendesk API functions into the existing Ruby on Rails login logic to make navigation between platforms seamless

Front End Developer • University of Toronto — January 2017 – April 2017

- **Addressed community reported bugs** and **added significant features** to Cytoscape.js (~25,000 weekly NPM downloads) such as the ability to layer multiple background images in a single node, becoming the **2nd largest contributor** to the repository by lines of code
- **Validated and updated all 12 first-party Cytoscape.js extensions** for the 2.x to 3.x release containing breaking API changes
- **Developed, tested, and released** the open-source **pathway-commons** JavaScript library on NPM which provided a simple, intuitive, human-readable JavaScript interface for computational biologists and application developers to query the Pathway Commons REST API

Full Stack Developer • Peekapak Inc. — May 2016 – August 2016

- Removed redundant back-end API calls and consolidated endpoints, **reducing load times from 3 seconds to 0.5 seconds** on average
- **Created a fully functioning REST interface** using the polyglot (Java, JavaScript) Vert.x framework to receive billing transactions using the Braintree service with the goal of replacing manual invoice and billing, improving customer experience and increasing efficiency

Projects

Vehicle HMI System • University of Waterloo Alternative Fuels Team (UWAFT)

- **Constructed an infotainment framework** for the UWAFT Chevrolet Blazer Competition Vehicle to serve current and future connected autonomous vehicle applications without compromising cabin refinement through intuitive interface design and beautiful aesthetics
- **Created and developed 4 interface applications** including an animated instrument cluster, built using Three.js with custom WebGL shaders, designed using human factors engineering principles to enhance usability and safety on the road

Technical Skills

- Strong expertise with ES6 JavaScript, React, Vue.js, Bootstrap, Node, CSS/SASS, and Git SCM
- Familiar with Cytoscape.js, D3, Three.js, Express, jQuery, and MATLAB
- Prior experience with Java, Python, PHP, Ruby, C/C++, C#, AWS, GraphQL, MySQL, and Oracle Relational Databases