Connor Sweet

Robotics and Full-Stack Software Developer

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Work Experience

Robotics Software Developer

Lincoln Electric Automation

July 2023 – Present
September 2022 – December 2022 (Co-op)
January 2022 – April 2022 (Co-op)

- Used Vue, TypeScript, fp-ts, Effect and Babylon.js to build and support a pendant-based robotic welding interface
- Developed a system to author user-taught robot actions as recognizable welding instructions for Fanuc and ABB robots
- Wrote an algorithm to convert the location and orientation of cartesian 3D points into relative frame representations, supporting coordinated motion between a 7 axis robot and an external rotary trunnion
- Created a multi-pass welding solution, leveraging quaternion-based transformations to interpret user-defined torch offsets
- Derived cartesian offsets relative to a path's coordinate frame using recorded positions
- Wrote pure, monadic code under the functional paradigm with fp-ts and Effect to increase determinism, scalability and testability
- Produced a method to support remote cycle execution of welding programs across robots using an operator panel
- Authored a data migration workflow for persistence of programmed weld parameters into revised format to enable welding with crater fill

Developer and Automation Specialist

Mach7 Technologies

January 2021 – April 2021 (Co-op)

- Created Dart API allowing PostMessage requests through commands sent by external applications
- Developed Javascript API to aggregate performance metrics from onscreen video in a clinical viewer
- Built infrastructure for frame rate performance testing in Java
- Implemented spine label DICOM markup manipulation through console commands in clinical viewer

Developer and Test Specialist

Client Outlook Inc.

May 2020 – August 2020 (Co-op)
May 2019 – Dec 2019 (Co-op)

- Implemented PostMessage API functionality for creating and manipulating markups on studies through external applications
- Added utilities to Maven automated test suites to perform screen layout validations
- Developed an external Dart application to control an embedded clinical viewer through PostMessage requests
- Implemented functionality within an internal Javascript API to notify the viewer of requests for actions from external applications
- Contributed to a clinical viewer product in compliance with PureMVC framework to introduce functionality necessary for validation

Skills

Languages

- TypeScript
- Javascript
- Dart
- Python
- C / C++
- C#
- MATLAB
- Java
- SQL
- Haskell
- RISC-V
- Verilog / VHDL

Tools

- Git
- PowerShell
- Node.js
- Vue.js
- React
- fp-ts
- Effect
- Jest
- TensorFlow
- ROS
- SolidWorks

Education

BASc: Honours Computer Engineering - Artificial Intelligence Option

University of Waterloo

2017 – 2023

- Graduated with Distinction
- Elected Class Academic Representative
- Member of Waterloo Mars Rover and Robotics teams

Projects

Shapley Routing Python API

- Designed and integrated an algorithm to compute exact Shapley values for ride-sharing games, facilitating fair cost allocation among participants
- Developed an efficient O(1) method for approximating Shapley values in ride-sharing scenarios with many participants

Indoor GPS Navigation System

- Implemented building mapping workflow in React Native, allowing users to graph points of interest based on uploaded floor plans and GPS coordinates
- Developed a backend server in Django connected to a PostgreSQL database to store maps of multiple buildings with several floors