

# 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	Tools
<ul style="list-style-type: none"><li>TypeScript</li><li>Javascript</li><li>Dart</li><li>Python</li><li>C / C++</li><li>C#</li><li>MATLAB</li><li>Java</li><li>SQL</li><li>Haskell</li><li>RISC-V</li><li>Verilog / VHDL</li></ul>	<ul style="list-style-type: none"><li>Git</li><li>PowerShell</li><li>Node.js</li><li>Vue.js</li><li>React</li><li>fp-ts</li><li>Effect</li><li>Jest</li><li>TensorFlow</li><li>ROS</li><li>SolidWorks</li></ul>

## 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