

Robert Humphrey

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Summary: Software engineer with background in mechanical engineering, interested in high-ownership software development roles. Passionate about learning new things and solving challenging problems.

EXPERIENCE

3dB Labs - Cincinnati, OH

Sep 2019 - present

Software Engineer

- Support the development of Sceptre, a signal processing application for RF awareness and signal analysis. Development is primarily in C++, heavily leveraging the Qt framework for native ui development, and Javascript/HTML for web displays.
- Act as lead developer for several contracts, responsible for gathering requirements with customers, providing guidance to engineers on the team, reviewing merge requests, as well as individual contribution.
- Integrate new software-defined radios into Sceptre, requiring additional control over tuning and gain, integration of IQ and spectral data into data pipelines, and incorporation into analysis tools such as tuning, filtering, recording, etc.
- Have singular responsibility for the development of several plugins in the Sceptre application:
 - "TLE" plugin - This feature allows users to load satellite orbital track data to calculate and view upcoming passes, schedule RF collections, and task antenna positioners to track satellites throughout collections. Coordinated directly with customers to develop requirements, and acted as lead developer with several other team members.
 - "Web FIFO" plugin - An effort to extend web-based file viewing capabilities in Sceptre to be capable of being installed in external web applications. As a prerequisite, the task required repackaging of several disparate and unorganized web pages into a more cohesive and reusable structure. Work for this utilized tools like Webpack, Node.js, Babel, and many other javascript tools.
 - "Job Manager" plugin - A plugin allowing users to create arbitrary triggers and actions based off events occurring throughout the Sceptre application, which are sequentially executed in a queue by any registered workers. This plugin now serves as a backbone for many different processing tasks throughout the application.
 - "Local Map" plugin - An effort that created a new zoomable and pannable map display, allowing users to load floor plans, place sensors, and view effects of real-time collected intercepts.
 - "Heatmap" plugin - Addition to the global map display to display a density map, allowing users to more easily identify RF activity based on location and signal strength. Utilized SIMD processing to speed up rendering.

ITE - Loveland, OH

Oct 2017 - Sep 2019

Staff Engineer

- Responsibilities initially were primarily mechanical, but shifted toward software development in the latter half of my employment with ITE.
- Developed and maintained a web API for communication between production automation equipment and a surgical robotic system for calibration and end-of-line test machines.
- Responsible for analysis and design of a novel new machine used in the manufacturing of thin walled aluminum cans

Space Exploration Technologies (SpaceX) - Hawthorne, CA

Jan 2015 - Oct 2017

Structures Engineer

- Responsible engineer for several landing leg mechanism components including the "Draw Lock" – a flight critical latch mechanism designed to hold and deploy the legs during flight – and the "Kick Actuator" – a landing critical pneumatic pusher mechanism required for leg deployment.
- Designed all components in CAD and performed structural analysis to develop flight margins. Owned over 75 components in all.
- Development of analytical model for pneumatic system simulation in Matlab. Results were used to assign load requirements for all pneumatic components in the mechanism.

EDUCATION

University of Michigan - Ann Arbor, MI

Sep 2010 - Dec 2014

B.S.E. Aerospace Engineering, Summa Cum Laude

- Programming classes focused primarily on applications in aerospace engineering such as orbital mechanics, Finite Element Analysis (FEA), and Computational Fluid Dynamics (CFD)
- Membership in Aero Honor Society Sigma Gamma Tau, Michigan Hybrid Racing team, Michigan Marching Band

MISC.

- Programming Languages: C++, Python, Javascript, Bash
- Fabrication Skills: Machining, Welding, 3D Printing, Soldering
- Hobbies: Wood Working, Home Lab, DIY CNC Laser Build