ERICK AVALOS

Software Engineer

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Los Angeles, Ca

EDUCATION

B.S.
Electrical Engineering
UCLA
September 2017 - June 2020
Los Angeles, CA

SKILLS

- Python
- C/C++
- C#
- CSS/HTML/Javascript
- Flask / Django
- NodeJS
- React
- Matlab / Simulink
- Wind River VxWorks 7.0
- Visual Studio
- JIRA / Git
- Linux / Windows
- TCP / UDP
- SpaceWire
- MIL-STD-1553
- RS-422
- ARINC 429

WORK EXPERIENCE

Software Engineer

Northrop Grumman Corporation

January 2022 - current

- Built a web application utilizing Flask web development framework to track real time exceedances of an early missile detector
- Integrated Javascript, CSS, and HTML into the front end Flask web application
- Built a TCP IP library to read raw data from a Queue to Socket port and decode low level data from packets
- Built Python drivers to read real-time Virtual Channel Identifiers (VCIDs) and extract missile exceedances
- Integrated low level drivers into Flask Python Backend to plot real time exceedances on the Front-End

Software Developer

Cardano Blockchain NFT Project

January 2022 - current

- Built an automated script using Javascript to generate a randomized 10k NFT collection based off of multiple layers of images
- Built a minting service utilizing NFT Maker Pros APIs that detects minters sending ADA to our wallet, and mints the asset to the minter
- Built a Twitter Bot in Python running on an AWS-EC2 instance that detects real time sells, and tweets a brief description of the asset and an image. Bot can be found here https://twitter.com/cardanobugsbot
- Built a Multi-Signature web application using Node.js and React deployed on Heroku to help integrate an optimized minting service. Testing website is here: https://minter-machine.herokuapp.com
- Integrated Multi-Signature mints on Cardano Testnet to show a proof of concept of optimized transaction speeds and real time mints.

Systems Engineer Simulation and Analysis

Northrop Grumman Corporation

March 2021 - December 2022

- Integrated Wilson PI Controllers to 2-phase quadrature and direct currents to minimize errors against the commanded current
- Integrated a harmonic compensator algorithm within Simulink to compensate for 1st and 2nd order harmonics introduced in 32 speed resolvers
- Developed an offline and online self-calibration scheme to minimize hardware errors introduced in the lifecycle of the product
- Built a 99-state open loop Kalman Filter against a simulated sled test profile to extract sigma ratios for observability analysis in Matlab in order to find the most optimal orientation for a Sled Test
- Built a free inertial navigation solution using matrix exponential for our sled test to predict the final Circular Error Estimate (CEP)
- Built Monte Carlo Simulations against my 134-state Kalman Filter to accurately tune, identify unobservable states, and analyze optimality between keeping states in open loop or closed loop

- Integrated the 134-state Kalman Filter with recorded data from our sled test to accurately navigate through the sled test. As a result, the final CEP was within 0.5 ft in cross track and down track of the 5 mile track

Associate Software Engineer

Northrop Grumman Corporation

June 2020 - March 2021

- Used VxWorks 7.0 Real Time Operating System (RTOS) to interface Spacewire RMAP Protocol with TCP IP to gain communication with FPGA modules
- Developed automation scripts in Python that advanced the team schedule by a month saving the program budget 10%
- Used Django Python Web Framework to create a webpage for feasibility in running automated scripts that interfaced with our FPGA hardware
- Used C / C++ to interface FPGA Nodes with Flight Software in VxWorks RTOS Environment
- Utilized Linux Red Hat to execute and test real time C++ code
- Managed our GIT repositories via Bitbucket for adequate source control
- Lead the team as a Scrum Master using Agile Development via JIRA to manage our team in maximizing our throughput of Software Development to meet our Program Schedule

Systems Engineering Co-op / Intern

Northrop Grumman Corporation

June 2018 - June 2020

- Integrated a Helicopter Keyboard Unit (KBU) with Multi-Functional Displays (MFDs) and Dual-Functional Displays (DFD) to communicate user inputs using Simulink
- Processed KBU inputs using ARINC 429 to communicate with Technical Refresh Mission Computer (TRMC)
- Developed Simulink models that interfaced Technical Refresh Mission Computer (TRMC) and MIL-STD-1553 bus protocol
- Refactored existing Simulink models and Matlab scripts from legacy aircraft to support model referencing models and Matlab scripts from legacy aircraft to support model referencing

Software Developer

Northrop Grumman Corporation Competition (1st Place)

June 2019 - October 2019

- Interfaced C++ with infrared camera to extract hardware data
- Integrated OpenCV in Python to analyze raw infrared data to detected hottest contour in Field of View (FOV)
- Correlated polar coordinates of actuators to planar coordinates to estimate the x-y distance to centralize IR Camera
- Interfaced the IR Camera with actuators and a laser to work in a closed loop PID control system to track and shoot the object in real time
- Live Demonstration here: https://www.linkedin.com/posts/erick-avalos-13014012a_pidcontrols-opencv-activity-6601590769793007616-cf1r