Carson Schubert

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EDUCATION

The University of Texas at Austin **B.S Electrical and Computer Engineering** (GPA: 3.89) **Dec 2020**

Focus: Communications, Signal Processing, Networks and Systems / Data Science and Information Processing

Relevant Coursework: Data Structures and Algorithms, Software Design, Embedded Systems, Circuit Theory

RELEVANT EXPERIENCE

NASA Glenn Research Center | *Machine Learning Intern* Aug 2018 – Dec 2018

- Developed a reinforcement learning algorithm (agent) to run onboard an orbiting satellite which optimizes data downlink autonomously, maximizing data throughput and reducing human interaction
- Repurposed existing simulation tools written in MATLAB to generate realistic training episodes quickly
- Wrote an OpenAI Gym environment in Python to facilitate the use of training episodes and provide agent rewards
- Trained a neural network inside this simulation environment using PyTorch to approximate agent's policy
- First author on a soon to be published NASA Technical Memorandum covering the results of this research

Nate Controls | *Cloud Engineering Intern* June 2018 – Aug 2018

- Developed an application to connect an arbitrary number of IOT devices to a wireless access point via a captive portal, allowing set up of devices in the field without company interaction for the first time
- Designed and wrote a new device backend from scratch in Typescript using AWS Lambda, DynamoDB, and S3
- Implemented an automated testing workflow using Jest for use on all future Typescript applications

Texas Spacecraft Laboratory | *Seeker Vision Flight Hardware/Software Lead* Sep 2017 – May 2018

- Developed visual navigation software using machine learning and computer vision techniques to run on an isolated microcomputer and camera for NASA JSC's Seeker CubeSat Mission
- Aided in development of a convolutional neural network for target identification using Google's TensorFlow
- Designed, implemented, and unit tested flight software in C to handle boot sequence, facilitate vision algorithms, and communicate with the main flight computer via Ethernet
- Implemented two tier process monitoring between Bash, C, and Python which prevents any hard crashes on orbit
- Wrote a custom suite of logging and data visualization scripts to characterize performance onboard target hardware that led to smarter and more successful algorithm development
- Created technical documents detailing setup of mission hardware/testing procedures to simplify integration
- Final system selected for flight to ISS in April 2019 over competing solutions due to its stability when integrated

PROJECTS

IEEE Region 5 Robotics | *Algorithms and Control Lead* Jan 2017 – May 2017

- Implemented closed-loop control of the robot using infrared sensors, rotary encoders, and a 3-axis gyroscope which increased reliability of robot performance in-game
- Integrated all sensors using I2C based GPIO expanders and custom drivers written in Python

Chain Reaction Robotics (FRC 6171) | *Captain* Oct 2015 – Aug 2016

- Co-founded team and secured over $20,000 in grants and donations to get team off the ground
- Led the development and fabrication of all subsystems to their successful integration in six weeks
- Developed Java software for closed-loop autonomous and piloted control of the robot for precise movement
- Led the team to the Rookie-All-Star award at Dallas Regional and a spot in World Championships

SKILLS

- **Programming Languages:** C, C++, Python, Java, Javascript, Typescript, Bash, MATLAB
- **Tools/Software:** Git, GitLab CI/CD, PyTorch, OpenCV, AWS, NodeJS, Terminal, Shell/Bash scripting, Jupyter
- **Instruments & Machines:** 3D Printer, Laser Cutter, Soldering Iron, Drill Press, Belt Sander

ACTIVITIES/HONORS

- **Student Engineering Council,** University of Texas at Austin: Fall 2017 – Present
- **1st Place,** NASA International SpaceApps Hackathon, Cleveland Event: Oct 2018