Carson Schubert

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EDUCATION

University of Texas at Austin — **B.S Electrical and Computer Engineering, B.S Mathematics** — **May 2021**
GPA: 3.90/4.0
Concentration: Communications, Signal Processing, and Embedded Systems
Coursework: Linear Sys. And Signals, Algorithms, Circuit Theory, Software Eng.

RELEVANT EXPERIENCE

Blue Origin | **Advanced Development Programs Intern** | *Kent, WA* — Sep 2019 – Dec 2019

- Led software development efforts for a large-scale, research level embedded computing platform survey in C/C++
- Ported performance benchmarking workloads to a variety of SoC's, single board computers, and microcontrollers
- Architected and injected a generic porting layer into each workload that enables rapid porting for new platforms
- Developed a rigorous, automated build infrastructure that ensures experimental repeatability
- Implemented control script in Python to run environmental test campaigns via interactive terminal interface

Jet Propulsion Laboratory | **Mission Simulation Intern** | *Pasadena, CA* — May 2019 – Aug 2019

- Converted Europa Clipper mission simulation to cloud based architecture based on Docker and Jenkins
- Automated transitions between simulation steps to reduce human workload by over 80% per simulation run
- New architecture abstracted simulation pipeline complexity, opening simulation use to many more lab members
- Scalable cloud architecture enabled the first parallel simulation runs, improving analysis turn-around time by an order of magnitude and greatly lowering barrier to additional simulations
- Integrated external Johns Hopkins Applied Physics Laboratory scheduling tool with JPL simulation pipeline

NASA Glenn Research Center | **Research Intern** | *Cleveland, OH* — Aug 2018 – Dec 2018

- Developed a proof-of-concept reinforcement learning agent which optimizes on-orbit satellite data downlink autonomously to maximize data throughput and reduce human workload
- Repurposed existing simulation tools written in MATLAB to generate necessary training episodes quickly
- Wrote an OpenAI Gym environment in Python to facilitate the use of training episodes and provide agent rewards
- Modeled agent using a neural network developed and trained with PyTorch
- Tuned network hyperparameters via grid search and trained agent using K-fold cross validation
- Final agent achieves over 98% of maximum possible reward on the test set, demonstrating optimal behavior

Texas Spacecraft Laboratory | **Seeker Vision Flight Software Lead** | *Austin, TX* — Sep 2017 – May 2018

- Developed a novel visual navigation system for NASA JSC's Seeker-1 mission based on a single monocular camera
- Aided in development of a convolutional neural network for target identification using Google's TensorFlow
- Developed and tested all flight software in C to facilitate vision algorithms and send solutions to guidance system
- Implemented two tier process monitoring between Bash, C, and Python resulting in zero crashes during testing
- Wrote scripts to characterize performance on hardware, giving key feedback for iterative algorithm development
- Final system selected for flight over competing solutions due to robustness and used during mission in Sep. 2019

SKILLS

Programming Languages	Technologies	Miscellaneous
C | C++ | Python | Java	PyTorch | OpenCV | Docker	Project Management
Javascript | Typescript | Bash	AWS | GitLab CI | ROS | Git	Technical Writing
MATLAB | Rust	Jenkins | NodeJS | Latex	Ability to work independently

PUBLICATIONS

C. Schubert, R. Roche, and J. Briones, "Reinforcement Learning Applied to Cognitive Space Communications," *2019 IEEE Cognitive Communications for Aerospace Applications Workshop*, pp. 1-8. doi: 10.1109/CCAAW.2019.8904912

N. Dhamani, G. Martin, C. Schubert, et. al, "Applications of Machine Learning And Monocular-Vision for Autonomous On-Orbit Proximity Operations," *AIAA SciTech 2020 Forum*, Orlando, FL, Jan. 2020. doi: 10.2514/6.2020-1376