

SUMMARY

Aerospace engineer with passion for autonomous control systems and computer vision. Strong computer science skills with functional background in math and controls. Desire to expand artificial intelligence and machine learning practical knowledge through applied research projects. Confident, self-directed learner heavily motivated in subjects aligned with personal interests.

EDUCATION

Purdue University – West Lafayette, IN

May 2019

- BS in Aerospace Engineering | Major Concentration: Aircraft Design | Minor Concentration: Controls

EMPLOYMENT

Textron Systems – Aerospace Engineer II – Hunt Valley, MD

*August 2021 to
present*

- Led a technical team in developing and testing an autonomy pipeline for landing VTOL vehicles on dynamically moving targets. Implemented a distributed Extended Kalman Filter for delayed perception data fusion and deployed a nonlinear model predictive controller for multi-objective terminal control.
- Developed and optimized vision-based ATR models through use of transfer learning, synthetic datasets, and model distillation. Successfully quantized models for efficient deployment on embedded hardware.
- Matured vision-based pose algorithms for use on Jetson embedded computing system for DARPA Sea Train unmanned surface vessel fleet
- Oversaw multiple intern team projects focused on expanding the autonomy lab's capabilities in the areas of vision-based perception, multi-agent collaborative autonomy, and system identification
- Trained and deployed pose detection algorithm on Jetson Xavier system using PyTorch key point detection model and adapted PNP solver
- Performed hands on research with a state-of-the-art event camera. Characterized the sensor, examined direct application to common computer vision problems, and explored the integration of spiking neural networks on neuromorphic processors

Bell – Stress Engineer / Flight Controls Software Engineer – Fort Worth, TX

*August 2020 to
August 2021*

- Developed a bird strike simulation model in LS-Dyna to test critical nose and windshield panels prior to physical testing to inform future certification efforts for Bell 412 aircraft
- Performed initial analysis of and helped plan Bell 412 tail rotor shaft fatigue testing in support of aircraft weight increase
- Revised and developed high level requirements-based test procedures for updates to Bell 429 aircraft low speed automated flight modes

Textron Systems – Controls Engineer – Hunt Valley, MD

*August 2019 to
August 2020*

- Researched and characterized fiducial based computer vision algorithms, ultimately leading to award of DARPA Sea Train contract
- Developed prototype embedded system to demonstrate a computer vision algorithm's ability to command the position of a UAS over a moving target
- Collaborated with the controls team to develop, test, and tune a body-rate motion controller for Ripsaw and other platforms, leveraging a mathematical plant model of tracked vehicles to enhance simulation and tuning capabilities

Spirit AeroSystems – Design Engineering Intern – Wichita, KS

Summer 2018

- Redesigned Boeing 737MAX over-wing intercostal and supporting structure to incorporate additional emergency equipment installation

Relevant Skills & Certifications

- Secret-level clearance (August 2022–present)
- Part 107 remote pilot certificate
- 3D modeling and extensive 3D printing experience (CATIA V5/V6, NX, Solidworks, Fusion 360)
- PCB & circuit design, production, and assembly (KiCad, Autodesk Eagle)
- Software design experience (C, C++, C#, Python, Qt, Android Development, Linux, Docker)
- AI/ML experience (PyTorch, Tensorflow, Keras, TensorRT)
- Extensive MATLAB and Simulink experience

More information about coursework and major personal projects can be found at www.justinsutcliff.com