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Justin Sutcliff

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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 AI/ML 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

- Bachelor of Science in Aerospace Engineering

EMPLOYMENT

Textron Systems – Aerospace Engineer – Hunt Valley, MD

August 2021 to present

- Matured vision-based pose algorithms for use on Jetson embedded computing system for DARPA Sea Train unmanned surface vessel fleet
- Oversaw two intern team projects focused on expanding the autonomy lab's capabilities in the areas of vision-based perception and multi-agent collaborative autonomy
- Designed and simulated high level nonlinear model predictive control algorithms for landing VTOL systems on a target moving with 6 degrees of freedom
- 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

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

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 Seatrain contract
- Worked with controls team to develop, test, and tune motion controller for Ripsaw and other tracked vehicle platforms
- Developed prototype embedded system to demonstrate a computer vision algorithm's ability to command the position of a UAS over a moving target
- Developed a mathematical plant model of tracked vehicles to allow controls team to better simulate and tune a body-rate motion controller
- Developed data processing tools to allow engineers to parse, display, and analyze test data faster and more accurately than previously possible
- Upgraded motor controller hardware on subscale test platform to incorporate torque-based control

Spirit AeroSystems – Design Engineering Intern – Wichita, KS

Summer 2018

- Redesigned Boeing 737MAX over-wing intercostal and supporting structure to incorporate additional emergency equipment installation
- Examined viability of various masking techniques in order to streamline application process of paints and compounds during final stages of fuselage production

Aerial Agriculture – Research and Development – West Lafayette, IN

September 2015 to August 2016

- Developed autonomous aerial vehicle platform for capturing multispectral images of vegetation to determine crop health
- Led product development of ground sensor system used to monitor high value crops

CAMPUS INVOLVEMENT / LEADERSHIP

Purdue Engineering Presidents Council *August 2017 to May 2019*

- Coordinate with other student organization leaders on campus to benefit the engineering community
- Functioned as liaison for feedback between students and the Dean of Engineering

Purdue Drone Club *August 2015 to May 2019*

- President: *(2017 – 2018),* Vice President*: (2015 – 2016),* Founding Member
- Hosted largest collegiate drone racing event in the nation two years in a row

CDRA – Collegiate Drone Racing Association *August 2017 to May 2019*

- Founded nonprofit organization for the management of collegiate drone racing
- Designed organization website with ranking system used for yearly competition

Relevant Skills & Certifications

- Secret-level clearance, active (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, html, Linux)
- 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**