Caleb Patton

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EDUCATION

University of Nevada, Reno - *M.S. Mechanical Engineering* *Jan 2023 - Dec 2024*
Control Theory, Aerospace Simulations, Multi-Agent Systems *GPA: 4.0/4.0*

University of Illinois, Urbana-Champaign - *B.S. Computer Engineering* *Aug 2018 - May 2022*
Computer Vision, Deep Learning, Robotics, Embedded Systems *GPA: 3.77/4.0*

EXPERIENCE

Computer Vision Software Intern – *Sierra Nevada Corporation* *May 2023 - Present*
Autonomous Vehicles Team *Sparks, NV*

- Used Computer Vision and Model Predictive Control to implement landing algorithms for an Autonomous Flight Vehicle in a simulated environment
- Used Deep Learning to develop perception and localization capabilities for Autonomous Ground Vehicles

Graduate Research Assistant – *University of Nevada - Reno* *Jan 2023 - Present*
Learning Autonomy and Control Systems Lab + Robotic Workers Lab *Reno, NV*

- Used ROS, Python, and C++ to architect a Simulated Environment for Autonomous Vehicles using CARLA, Gazebo and PX4 to test Control, Mapping and Deep Learning Algorithms
- Used the DJI SDK and ROS to create a Perception HW/SW stack to fly a DJI M600 fully autonomously in a GPS-Denied Environment by using Sensor Fusion on LIDAR, RGB-D and IMU data
- Tested the accuracy of Voxblox and Octomap mapping algorithms in a simulated environment
- Researched methods of generating optimal trajectories for UAVs to avoid obstacles, moving and static, using Deep Learning and Kalman Filters
- Researched methods of improving the guidance algorithms of Swarm Robotic systems using Computer Vision

Computer Vision and Robotics Intern – *Brunswick Corporation* *Feb 2021 - Dec 2021*
Autonomy Team *Champaign, IL*

- Developed two perception systems for an autonomous watercraft to detect swimmers, boats, docks, and other obstacles using FasterRCNN, YOLOv5 and MaskRCNN at 30 fps and 10 fps
- Researched methods to utilize and generate synthetic data to improve performance of DNNs using Unreal Engine by varying time of day, weather conditions and object generation

PROJECTS

RC Tricopter Scratch Build – *Electronics, RC Aircraft, CAD* *2020*

- Designed a Quadcopter frame that could constructed for under 5 dollars to test RC hobby electronics
- Used Fusion360 to design a folding arm Tricopter frame that could be cut from acrylic on a Laser Cutter

RC Flying Wing Scratch Build – *Electronics, RC Aircraft, CAD, Aerodynamics* *2018*

- Constructed a Flying Wing aircraft using foamboard and an APM Flight Controller for autonomous flight

TECHNICAL SKILLS

Software: Python, C/C++, PyTorch, ROS, CUDA, MATLAB, Simulink, Docker, SQL
Manufacturing: 3D Printing (FDM, SLA), Laser Cutters, Soldering, Power Tools
CAD: Fusion360, NX 12.0