MIKE SUTHERLAND

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Education

University of California, Irvine — Irvine, CA
Mechanical Engineering BSc — *Expected May 2022*

Projects

Lead Programmer — UAV Forge | *Software Development, Management, Systems Engineering* — Fall 2020 – Present

- Lead programmer for the UAV Forge student project, an unmanned aerial system that can fly autonomously, deliver packages, and search for objects on the ground
- Secured competition position at Association for Unmanned Vehicle Systems International Student UAS Competition in Maryland – the first ever in the 7-year history of the project
- Managed multiple software project across two 3-5 person programming subteams
- Migrated software teams to unified, ROS-based system, to enable seamless communication and interoperability between the UAV, the ground station, and the competition server
- Integrated all development with git/github, with CI documentation, packaging, and test coverage

Vision System — UAV Forge | *Software, Python, Machine Learning* — 2021/22

- Custom deep-learning vision system for recognizing and localizing objects from the air
- Created custom dataset rendering pipeline using Blender to generate synthetic training data for the neural network
- Trained custom object detector capable of localizing and classifying ground objects using the synthetic dataset; model achieved accurate object detection, classification, and localization on real images of objects
- Integrated ML model into image processing pipeline on power/weight efficient embedded hardware

SURP Research Fellowship | *Software, Python, Convex Optimization* — Summer 2021

- Developed novel method for generating optimal paths for dynamically constrained aerial vehicles in 3-D space
- Created python software package hosted on PyPi with simulation of path planner implementations, with performance gains from compiled subroutines on critical code paths
- Authored a paper pending publication, and presenting at UCI Undergraduate Research Symposium Spring 2022
- Implemented and tested path planner routine on ROBOTIS TurtleBot platform; planner used Simultaneous Localization and Mapping (SLAM) as basis for computing path through space

Autonomous Underwater Vehicle | *Software, C++, Embedded, Electronics, Testing* — Winter 2021/22

- Designed audio sensing system for micro underwater autonomous vehicle
- Wrote audio signal processing software (C++) for embedded (Arduino) device, capable of detecting and isolating high-frequency acoustic signal
- Used instructions from chip datasheet to change mode & increase clock rate of analog-to-digital converter (ADC), enabling the chip to detect high-frequency sounds
- Designed and performed testing of the system to isolate, detect, and measure tones from 4kHz - 12kHz range
- Created prototype 70mm x 35mm x 25mm acoustic probe with integrated sensor capable of communicating with main vehicle controller over i2c

Work Experience

Firm Principal/Co-Owner — 2016 - 2019
AJL Media, LLC — *San Diego, CA*

- Principal designer of effective trial opening and closing presentations with seamless presentation of video, image, and document evidence for legal clients
- Worked with small teams in trial to evaluate and eliminate weaknesses in trial strategy and case management
- Achieved profitability during the first year of operation and increased revenues 40% in the year following our acquisition of the company
- Performed all business/management related tasks – invoicing, accounting, client intake, scheduling, and marketing

Trial Consultant — 2013 - 2016
AJL Media, Inc. — *San Diego, CA*

- Managed real-time presentation of evidence for attorneys in trial and arbitration
- Assisted legal teams with preparation of evidence, demonstratives, opening and closing statements

Technical Skills

Languages: Python, C++, MATLAB, LaTeX, HTML/CSS
Tools/Frameworks: ROS, OpenCV, tensorflow **Software**: SolidWorks; Adobe CS; MS Office Excel, PowerPoint
Developer Tools: Bash/Terminal Scripting, Git/Github, CI (with Git workflows), Remote Deployment
Operating Systems: Linux / MacOS / Windows / Embedded (Arduino)