ALEX CAMERON BAILEY

(707) 999-8712 | www.linkedin.com/in/alexcameronbailey | a.cameronbailey@gmail.com

EDUCATION

SAN DIEGO STATE UNIVERSITY, College of Engineering Expected Spring 2020
Bachelor of Science in Aerospace Engineering GPA: 3.45
Minor in Computer Science

RELAVENT EXPERIENCE

Northrop Grumman **June 2019 - Present**
Systems Engineering Intern, Mission Systems
- Worked in a fast paced lab environment implementing test procedures through various stages of the Battlefield Airborne Communications Node payloads agile development cycle
- Demonstrated advanced operation and troubleshooting abilities for the various radios, waveforms, control links, and tactical data link networks associated with the payload and military standards
- Participated in a NASA flight test of the BACN payload through operation and of the WB-57 aircraft power and payload on the flight line

General Atomics Aeronautical Systems **June 2018 - June 2019**
Systems Engineering Intern, Controls Algorithms and Signal Processing
- Contributed to the development of a medium fidelity MQ-9 UAV simulator containing GPS and satellite constellation, 6DOF, IMU, Gimbal and motor models using C programming and Linux
- Participated in a flight test for video synthetic aperture radar through data collection and radar operation during flight
- Programmed a new 6DOF model and added a new data logging mode to the GUI for testing of the Lynx Radar
- Programmed a convolutional neural network using Matlab and deep learning for vehicle detection in video SAR

RESEARCH EXPERIENCE

National Security Innovation Network **Jan. 2020 - Present**
Lead Engineer
- Led a Pentagon-level U.S. Department of Defense initiative to develop UAS capabilities for the US Marine Corps
- Developing guidance navigation and control algorithms using Python and MATLAB for stable autonomous flight while transmitting data through WiFi remotely

San Diego State SPACE and Astronautics Laboratory **Feb. 2018 - Present**
Undergraduate Research Assistant
- Developed a 3-DOF cube satellite testbed that uses reaction wheels for supporting comprehensive studies and hardware experiments to be applied to sensing, guidance, dynamics, & control of space operations
- Modeled satellite components using SolidWorks and performed finite element analysis and fatigue analysis
- Developed a PID controller for the satellite model using the system dynamics and MATLAB
- Utilizing deep learning to perform research on a UAV detecting a drogue and extracting a navigation solution for in-flight autonomous refueling capabilities

San Diego State Advanced Fluid Dynamics Laboratory **Jan. 2019 - Jan. 2020**
Undergraduate Research Assistant
- Utilized Matlab and advanced mathematics to help develop a state of the art 3D pressure reconstruction algorithm for use with particle image velocimetry in wind and water tunnel environments

SKILLS AND HONORS

Honors:	Deans List: Spring 2016, Spring 2017, Fall 2017, Fall 2018, Spring 2019, Fall 2019
Programming:	MATLAB, Python, C, C++, Java, Linux, LabVIEW
Circuit Design:	Altium Designer, CircuitMaker
CAD Software:	SolidWorks, Creo Parametric 3.0
Other Skills:	Radios and tactical data link networks, Finite Element Analysis, NI Data Acquisition, DOORS, Visio, deep learning and artificial intelligence

ENGINEERING ORGANIZATIONS

San Diego State Rocket Project **Jan. 2018 - Present**

Avionics Team Lead Jan. 2018 - June 2018

- Led a team of 30 engineers in the design and development of all avionics systems and software including in-flight systems and ground stations for liquid bi-propellant rockets
- Developed systems and software for data acquisition and analysis, telemetry, and operation of actuators and pneumatics and igniters
- Used a custom built test stand and our data acquisition system to monitor pressures and to control valve actuation and ignition for the successful static fire of our regeneratively cooled methane and liquid-oxygen engine
    - Collected data from pressure transducers, thermocouples, and a load cell in order to accurately characterize the properties of our engine and test stand
- Used Altium Circuit Maker to design custom PCB's for power distribution and data aquisition for our solenoids and pressure transducers
- Created detailed SolidWorks CAD models for the avionics box's individual hardware components, electrical routing, and sensors and integrated them into an avionics box assembly for conducting tests on sizing and radio frequency capabilities
- Contributed to developing networking software using Node.js, Python, and the MQTT protocol for packaging and transmitting data packets for launch control

Rocket Project Stability and Controls Lead Sept. 2017 - Jan. 2018

- Led a group of 10 engineers in the research and development of active stabilization by applying closed-loop control in the form of fin-actuation and thrust vector control
- Interfaced with a 9 degree of freedom IMU using the I2C protocol and C++ to display and simulate orientation in 3D space in order to mathematically model and visualize our roll, pitch, and yaw data
- Developed a self-balancing robot and utilized models of the system dynamics to develop and tune PID controllers for closed-loop control and active stabilization of a non-linear system using Python

Rocket Project Propulsions Team Nov. 2017 - Jan. 2018

- Contributed to the design of a self-impinging fuel Injector for a subcritical ablative Methane liquid-Oxygen engine
- Modeled the injector in SolidWorks and simulated using SolidWorks Flow Simulation to optimize our orifice placement, ensuring proper distribution of the fuel and Oxidizer before combustion
- Conducted finite element analysis using SolidWorks to simulate deformation, stress, and strain under expected thermal and load conditions to help choose the most effective material and thickness for minimal weight and stress

Mechatronics Electrical Team **Aug. 2017 - Aug. 2018**

- Collaborate with a team of electrical, mechanical, and software engineers in the development of an autonomous submarine that uses deep learning, control systems and custom designed PCB's for systems and data acquisition
- Designed a custom CAN bus PCB shield for for interfacing with the Arduino microcontroller using C++ to create a serial data bus that allows for a reliable central networking system

PERSONAL PROJECTS

VTOL 3-Propeller Aircraft **August 2019 - Present**

- Modeled system dynamics using Simulink and MATLAB for vertical flight and horizontal flight
- Developed a flight controller using root locus plots and lead/lag compensators for optimal pole placement
- Performed low-speed wind tunnel experiments to characterize the aerodynamic properties of our aircraft and the performance of our motors

PH and temperature pool monitor **June 2017**

- Developed and programmed a circuit for measuring the PH and the temperature values of my families pool using C++ and the Arduino microcontroller
- Used the I2C protocol with C++ in order to collect serial data from two sensors and utilized galvanic isolation of the temperature and PH circuits in order to ensure accuracy of the data