Alex Abrams

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Education

Cornell University, College of Engineering
Bachelor of Science in **Mechanical and Aerospace Engineering,** May 2015
GPA: 3.16, **Dean's List** Fall 2011

Work Experience

Research and Development Engineer Fall 2015 - Spring 2017
Creare LLC, Hanover, NH
Contributed to the success of a wide array of SBIR-funded research and development projects for large-scale government and private clients. Demonstrated versatility of skills and the ability to fulfill multiple roles in the firm.

Engineering Intern Summer 2014
Innovative Dynamics, Inc., Ithaca, NY
Performed ANSYS Multi-Phase CFD simulations for design optimization of a cyclonic particle separator. Programmed Ice-Detection software in C for a Ubuntu Unix-based environment.

Select Engineering Projects

- **Medical Research Application Development:** Developed a desktop application in **Python** to help researchers gather data on human hearing. The application was for an academic client looking to research the connection between HIV/AIDS and hearing loss. Developed protocols to interface with hardware used for testing human hearing. Also wrote a suite of tests used to gather data on a variety of hearing conditions for each research subject. Deployment of this test was successful in a study performed by the research group in Tanzania.
- **Laser Metrology System Development:** Wrote and executed a test plan to validate the functionality of a laser metrology system used to measure fastener flushness on aircraft fuselages. Directed fellow engineers and technicians to carry out the test plan, gathered data and analyzed the results to validate the functionality of the system. Successful execution of this test plan lead to the commercialization of the technology under an SBIR grant.
- **Aircraft Catch and Release System:** Analyzed the motion of a catch and release system for naval aircraft using **Matlab, Python,** and fundamental equations of motion. Created animations of the system in motion for use in a client report. Data from analysis was used successfully to optimize the design of holdback bar used to secure the aircraft while building thrust.
- **Non-Linear Controller Optimization for an Autonomous Bicycle:** Utilized skills in dynamic system analysis to optimize stabilization controller for an autonomous bicycle. Used fundamental equations of motion and symbolic algebra in Matlab to solve for system's equations of motion. Optimized non-linear controller by using an evolutionary algorithm to systematically run many simulations of the bicycle's motion while honing in on the optimal control parameters. Our optimized controller was able to successfully stabilize the bicycle during real-world tests.
- **Firmware development** for a star tracking satellite, **cryocooler system** design and analysis, educational **video game development** in **Unity**.

Skills

Engineering Applications

- ANSYS (Fluent CFD, Structural)
- Solidworks / Inventor
- Matlab
- LabVIEW

Programming Experience and Tools

- Application Development (Python, C#)
- Web Development (JavaScript, HTML, CSS)
- Video Game Development (Unity)
- Version Control (git, SVN)
- Firmware Development (C)
- Java, C++, Visual Basic

Research Experience

Senior Design Project: Autonomous Bicycle Spring 2015

Cornell University Biorobotics and Locomotion Lab, Ithaca, NY

Worked in a highly collaborative research environment with engineers from a variety of backgrounds, including mechanical, electrical, controls, and software engineering. My area of the project involved optimizing a stabilization controller for the bicycle using non-linear dynamics and evolutionary optimization algorithms.

Sabbatical

During the spring of 2017, I voluntarily left my position at Creare LLC in order to pursue employment in an area that is more aligned with my passions. In the interim period, I took time to explore my passion of climbing and outdoor recreation. Looking forward to relaunching my career in engineering, I feel more energized and prepared to tackle the challenges of my field than I ever have before.

Additional Experience

Vice President and Climbing Chairperson 2012-2015

Cornell Outing Club, Ithaca, NY

Facilitated club meetings and ran climbing excursions for all ability levels. Procured funding from the university for new climbing gear. Ordered, organized, and maintained gear for the club. Negotiated with university administration to secure a new meeting and equipment storage facility for the organization.

Undergraduate Teaching Assistant Spring 2012

Department of Physics, Cornell University, Ithaca, NY

Worked alongside physics professors, graduate teaching assistants, and local high school teachers to administer practical laboratory experiments and run office hours. Took part in a course on educational theory taught by an experienced high school physics teacher to augment my previous physics educational and aid in developing sound instructional techniques.

Research Assistant Summer 2012

Cornell University Department of Electrical and Computer Engineering, Ithaca, NY

Wrote a device driver program for a new Microwave Transition Analyzer using C++ and IC-CAP software.

References available upon request.