

# Andrew W. Lyjak

SOFTWARE ASSURANCE/VERIFICATION/DEVELOPMENT · SYSTEMS ENGINEER

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*"This is the real secret of life – to be completely engaged with what you are doing in the here and now. And instead of calling it work, realize it is play."*

October 6, 2018

ONEBRIDGE

6500 TECHNOLOGY CENTER DR.

INDIANAPOLIS, IN 46278, USA

## Introduction

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Dear Onebridge recruitment team,

I recently moved to Indianapolis after living and working in Los Angeles for over eight years. During this time, I have been employed by SpaceX. Currently I'm performing my job remotely from my home office in Indianapolis, but I am looking to move on, and searching for new adventures in an exciting, technology driven company local to this city.

My interests revolve around bridging the digital and physical world in ways that are intuitive and safe. At SpaceX, I implement and execute software assurance activities related to ensuring the safety and quality of flight software for the Falcon and Dragon vehicles. In this position I have gathered and maintained experience in a diverse range of engineering fields: examples include the "hard" engineering fields such as aerospace, electrical, and computer engineering, as well as the "soft" engineering fields such as process, quality, and requirements engineering.

Additionally, I have had numerous opportunities to collaborate with my wife on machine learning problems and their solutions related to her work as a neuroscientist specializing in studying imaging and genetics related to the understanding of Alzheimer's disease. This is how I have developed proficiency with R, specifically associated with its tremendous capabilities in the fields of machine learning and data analysis.

## Why Onebridge?

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I had the opportunity to visit Onebridge as part of an R meetup in September and was very impressed with the personnel I met. Specifically, Bill McLellan's talk about his experience with igraph was quite engaging. From my quick tour, the company seems driven and sincere in their desire to solve some of the trickier problems facing their customers. In addition the breadth of skills fostered within Onebridge is very intriguing to me. As I hope you can see in my resume, I share many of the same interests and skill sets that the company fosters.

## Why Me?

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The skill set maintained by the Onebridge team – specifically the combination of analysis, application development, quality, and IT maintenance roles – applies very well to my skill set. My background in aerospace engineering should prove my technical acumen, while my broad range of experience at SpaceX should prove my capability, and self motivation. I pride myself in basing my work on first principles, this helps maintain focus on the right solution, not just what is currently popular or hyped. I believe I have established a reputation for being reliable and a valued and respected member of each team I have had the pleasure of working with. I look forward to having further conversations with the Onebridge team!

Sincerely,

**Andrew W. Lyjak**

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## Education

### University of Michigan

Ann Arbor, Michigan

M.E. IN SPACE SYSTEMS ENGINEERING

2009 - 2010

GPA: 3.769/4.000

### University of Michigan

Ann Arbor, Michigan

B.E. AEROSPACE ENGINEERING

2005 - 2009

- Minor in German
- GPA: 3.456/4.000

## Skills

**Programming** Python, LaTeX, ReStructuredText, Bash, Linux, R, Rust, C, C++

**Web** Django with Python, Javascript, HTML, CSS, SQL

**Systems Engineering** Regulation and Certification, Verification Planning, Fault Tolerance Analysis, Risk and Change Management

**Software Quality** git, Trac, Subversion, JIRA, Software Development Planning, Quality Audits

**Languages** English, German

## Experience

### Software Mission Assurance Engineer

Hawthorne, CA

SPACEX

2010 - Present

#### SOFTWARE CERTIFICATION FOR NASA SAFETY AND QUALITY REQUIREMENTS

2010 - Present

- Wrote the Flight Software Development Plan. This document defines SpaceX's custom agile development process for designing, developing, and verifying flight software.
- Designed, wrote, and maintain the Cargo Dragon Flight Software "Computer Based Control Systems" documentation. This material is used to demonstrate compliance with NASA software safety requirements and also defines many of the software safety test and analysis activities executed for verification of software safety related to the Dragon cargo vehicle.
- Perform process audits to verify software quality, and compliance with NASA requirements for the Dragon cargo vehicle.
- Maintain audits, and safety documents through all changes to system design and software for each new commercial cargo resupply mission.

#### INDEPENDENT VERIFICATION AND VALIDATION (IVV) CONTRACT MANAGEMENT

2010 - Present

- Serve as the technical point of contact for SpaceX's IVV Contracts for safety critical software.
- Provide the contractor with sufficient data to effectively evaluate the safety of the flight software. Contractor evaluates system design, source code, and verification results.
- Ensure the contractor's feedback is internally addressed and incorporated to create a better product for each commercial crew and cargo mission.
- Manage contracts associated with IVV of flight software for Crew Dragon, Cargo Dragon, and the Autonomous Flight Termination System.

#### SOFTWARE PROCESS TOOL DEVELOPMENT

2012 - Present

- **branchdiff** - Developed an application to view the differences between two Subversion branches to facilitate merge decisions between them. Displays differences as commits or as the set tickets referenced within those commit messages.
- Developed an application for viewing change over time for various Trac ticket queries.
- Performed trade studies on various software development ticketing systems. The study factored into SpaceX's decision to adopt JIRA across multiple business domains.
- **ReadTheManual** - Installed, modified, and administered an internal fork of ReadTheDocs for use within the SpaceX intranet. This service is used to build and distribute documentation for over 160 internal projects.
- **Tracegraph** - Designed and developed a library for defining systems relationships across information housed within multiple data silos. The library is used for verification tracking purposes to support compliance tracking of SpaceX processes to customer requirements.

#### DESIGN AND DEVELOPMENT OF THE SpaceX SOFTWARE STANDARD

2013 - Present

- Developed a software engineering standard for SpaceX. The standard provides a set of requirements to be applied to different classifications of software development, classifications include A, for safety and mission critical software, through D, used for desktop, R&D, or other non-critical applications. The standard is used to evaluate the quality of all software processes related to the Commercial Crew system.

#### FAULT TOLERANCE ANALYSIS

2016 - Present

- Co-developed the **Fault Tolerance Analysis Process**. This process is used to evaluate autonomous and/or operator controlled electromechanical systems. Analysis is used to assess the fault tolerance of a design in order to determine its capabilities and develop fault detection, isolation, and recovery logic for managing redundant capabilities.
- Developed test and analysis plans for verifying fault tolerance as defined through the Fault Tolerance Analysis products.
- With a team of 6 other engineers, executed the Fault Tolerance Analysis Process against 25 separate autonomous control systems within the Crew Dragon Architecture over the course of a year.