

# JOSEPH GIBSON

## COMPUTER ENGINEER

### EDUCATION

**Grand Valley State University**  
**B.S.E, Computer Engineering**  
Grand Rapids, MI

2015

GPA: 3.957 *Magna Cum Laude*

- ASEE CEED National Co-op Student of the Year 2014
- Academic Excellence Award in Computer Engineering
- Outstanding Co-op Student 2015
- Outstanding Senior in Computer Engineering 2015
- FIRST Robotics Engineering Scholarship
- Award for Excellence Scholarship
- Faculty Award of Distinction Scholarship

- Tau Beta Pi Engineering Honor Society
- President of Spanish Club
- President and Founder of Brewing Science and Technology Club
- Vice President of Hardware, Computer Science Club

### SKILLS



- |                                 |  |
|---------------------------------|--|
| Git version control             | FPGAs (VHDL)   |
| Unix Terminal (gdb, make, etc.) | Electrical schematic and PCB-design (Altium, Eagle, KiCad) |
| LaTeX                           | Oscilloscopes and mutimeters                               |
| Machine vision algorithms       | Circuit Analysis   |
| Algorithm optimization (C/C++)  | Space Systems Engineering                                  |
| Hybrid computing systems        | Space-Grade Processors                                     |
| Adobe Illustrator               | Avionics Systems   |
| ARM assembly language           | Embedded System Design                                     |
| Perl, Awk, Sed                  | Robotics   |
| HTML, CSS, PHP, JavaScript      | Astrophysics and Cosmology                                 |
| Operating Systems               | Electromagnetic Physics                                    |
| Cryptography                    | Particle Physics   |
| Network Security                |  |

### LANGUAGES



### EXPERIENCE

**NASA**

Washington, D.C.

**Goddard Space Flight Center**

**Sr. Flight Software Engineer, SAIC**

Jan 2016 - Present

**Code 480: Satellite Servicing Projects Division**

**Rendezvous and Proximity Operations Flight Software Lead**

- Restore-L robotic servicing mission
- Hybrid Flight Computing Systems Team
- Develop critical flight software in C/C++ on MicroBlaze, PowerPC e500v2, and x86-64 architectures
- Optimize and implement image processing and machine vision algorithms (edge detection, circle tracing, segmentation, 3D point cloud, filters, etc.) for autonomous spacecraft rendezvous, robot arm grapple, and GNC
- Accelerate algorithms using FPGAs, including hardware double precision floating point unit and software interface
- Develop flight applications for VxWorks using CFE/CFS and OSAL
- Develop drivers to interface with FPGAs (Xilinx Virtex-5) via PCIe and sRIO
- Experience with VxWorks, FreeRTOS, and embedded Linux
- Develop ground tools in Python for data analysis, image conversion, etc.
- Lead Security and Reliability Group (SRG) in charge of code review, static analysis tool (CodeSonar), and secure embedded coding
- Develop mission-level C/C++ Flight Coding Standards
- Flight system emulation in QEMU
- Write documentation in LaTeX and Doxygen
- Present technical information to board at critical reviews (PDR, CDR, etc.)
- NASA Foundations of Aerospace and Sys Admin certification
- Teach Git version control to multiple teams at NASA

**RFCx**

San Francisco, CA (Remote)

**Rainforest Connection**

**Senior Technical Advisor**

Jan 2015 - Jan 2017

- Combat illegal deforestation in Brazil and other rainforests with repurposed solar-powered Android phones mounted to trees
- Remote detection of chainsaws, engines, and gunshots
- Embedded software in C
- Solar power control circuitry (MPPT)
- PCB design in KiCad and Altium

**CERN**

Geneva, Switzerland

**European Center for Nuclear Research**

**Research Assistant, ATLAS Experiment**

Aug 2014 - Jan 2015

- Research in quantum chromodynamics at the Large Hadron Collider (ATLAS Experiment)
- Developed *Spectrum*, a proton-proton cross-section analysis software in C++, ROOT, and Python
- Designed [spectrum.web.cern.ch](http://spectrum.web.cern.ch) website in Python, PHP, and JavaScript

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## EXPERIENCE

### **NASA** **Washington, D.C.**

#### **Goddard Space Flight Center**

**Computer Engineering Co-op, BETTII Project** **Jan - May 2014**

**Code 665: Astrophysics, Observational Cosmology Laboratory**

- BETTII Project: <http://asd.gsfc.nasa.gov/bettii/>
- Balloon telescope for infrared interferometry
- Interfaced with stellar image processing software in C and C++
- Developed StarTracker software for star cameras
- Created an RS-422 communication network on an FPGA

### **L-3 Communications** **Grand Rapids, MI**

#### **Avionics Systems**

**Computer Engineering Co-op** **May - Sep 2013**

- Designed software to configure and test avionics instruments
- Developed GUIs in C using LabWindows/CVI
- Tested units under environmental conditions and analyzed data

### **Custom Electronics, Inc.** **Grand Rapids, MI**

#### **Engineering Consulting**

**Computer Engineering Co-op** **Nov 2011 - May 2013**

- Programmed 8-bit Microchip microcontrollers in C using MPLAB X
- Wrote software for scientific instrumentation buoys
- Designed a series of eight electric guitar effect pedals
- Designed electrical schematics and PCBs in Altium Designer

## INTERESTS

Languages, travel, culture, machine vision, cryptography, computer security, backpacking, hiking, brewing, physics