# JOSEPH GIBSON

## COMPUTER ENGINEER

2015

# **EDUCATION**

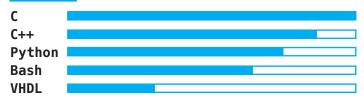
## Grand Valley State University B.S.E, Computer Engineering Grand Rapids, MI

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 Unix Terminal (gdb, make, etc.)

LaTeX

 $\label{eq:Machine vision algorithms} \mbox{Algorithm optimization (C/C++)}$ 

Hybrid computing systems

Adobe Illustrator

ARM assembly language

Perl, Awk, Sed

HTML, CSS, PHP, JavaScript

Operating Systems

Cryptography

Network Security

FPGAs (VHDL)

Electrical schematic and PCBdesign (Altium, Eagle, KiCad) Oscilloscopes and mutimeters Circuit Analysis Space Systems Engineering Space-Grade Processors Avionics Systems

Embedded System Design

Robotics Astrophysics and Cosmology

Electromagnetic Physics

Particle Physics

# LANGUAGES



# **EXPERIENCE**

# NASA Washington, D.C.

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

Sr. Flight Software Engineer, SAIC Jan 2016 - Present
Code 480: Satellite Servicing Projects Division

#### code 400. Salellile 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 website in Python, PHP, and JavaScript

# 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