# Jason Bens

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## Biography

I'm a hardware engineer at Loon, previously part of Google X. I've been designing hardware for the past six years, but I'm also interested in and have experience in software and firmware development. I'll be relocating with my family to Berlin in April, and intend to take a position working on both firmware and hardware.

## Skill Summary

### Competencies

| | | | |
|---|---|---|---|
| Schematic Capture | PCB Design/Layout | Analog/Digital Design | Electromagnetic Compliance |
| System Integration | Circuit Simulation | Prototyping and Test | Signal Integrity Validation |
| High Speed Design | High Density Design | Root Cause Analysis | Contract Manuf. Management |

### Tools

| | | | |
|---|---|---|---|
| Allegro/OrCAD | Altium | LTSpice/NgSpice | NI LabView |
| C/C++ | Python | MATLAB | ARM Assembly |

## Hardware Experience

**Hardware Engineer** — Mountain View, California
**Google X, Loon LLC** — *January 2020 - Current*

- As the main avionics engineer on Loon's next generation of flight vehicle, defined the requirements of, designed, and implemented a new avionics platform, launching Q1 2021 (Phase 1).
- Designed from scratch a new sensor fusion board for real-time flight data acquisition and controller actuation, forming the backbone of the next-gen flight vehicle's control system.
- Refactored an existing ballast dispenser board to simplify the design, removing or modifying several unnecessary power supplies and peripherals.
- Helped keep Loon weird by sneaking cat-themed art onto new circuit boards.

**Electrical Engineer** — Seattle, Washington
**Pensar Development** — *August 2015 - September 2018*

- Designed the schematics and circuit-board layout of several USB 2.0 and USB 3.0 hub boards for a medical ultrasound device.
- Spearheaded the EMC effort to reduce the device's RF emissions from 30 dB above the IEC-60601-1 limit to 15 dB below the limit using both electrical and mechanical modifications.
- Coordinated with local fabrication labs and larger contract manufacturers to prototype the device and bring it into production.
- Performed signal integrity measurements on high speed lines (DDR, USB 3.0, low MHz sine wave) and designed mitigations to reduce the effects of nearby RF coupling.

**Electrical Engineer** — Mukilteo, Washington
**Electroimpact** — *September 2014 - August 2015*

- Designed a sensor system to monitor the safety brakes on a carbon fiber placement gantry used in the construction of the Boeing 747.
- Integrated a positional control system with sensors for real-time control of a mobile gantry for carbon fiber placement.

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## Software Experience

**Electrical Engineer** <span style="float:right">Seattle, Washington</span>
**Pensar Development** <span style="float:right">*August 2015 - September 2018*</span>

- Wrote several python utility scripts for firmware updates, log scraping, and reporting on prototype devices under development.
- Developed a suite of automated manufacturing tests in Python and NI Labview for circuit-board validation of my boards at the contract manufacturer.

**Research Intern** <span style="float:right">Keihanna Science City, Kyoto, Japan</span>
**Advanced Telecommunications Research Institute International** <span style="float:right">*July 2012 - August 2013*</span>

- Implemented a stacked denoising autoencoder in Python to generate hypothetical functional MRI (fMRI) activations.
- Developed stimulus routines in Matlab to collect data on behavioural tasks from human test subjects.
- Analyzed fMRI, MEG, EEG, and anatomical MRI data using Python to locate and visualize neural activations measured during experiments.

**Projects and Extracurriculars**

- Implemented a waveform generator in C and Assembler on an ARM microcontroller capable of generating arbitrary waveforms up to 1 MHz.
- Developed firmware and device drivers for LCD display, capacitive-touch, Wi-Fi, and I/O peripherals on an embedded microcontroller demonstration board.

## Education

**Bachelor of Engineering in Electrical Engineering** <span style="float:right">University of Victoria</span>
GPA: 7.58/9.00 <span style="float:right">*Graduated 2014*</span>

- Specializations in Computational Intelligence and Electromagnetics & Photonics

**Diploma in Electronics Engineering Technology** <span style="float:right">Southern Alberta Institute of Technology</span>
GPA: 3.82/4.00 with Honours <span style="float:right">*Graduated 2011*</span>