

Raymond Jimenez

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SELECTED WORK EXPERIENCE

- ◇ **Avionics Hardware Engineer**, Phase Four *October 2017–present*
 - *Thruster Lead Engineer*: Leading the team responsible for next-generation thruster design, characterization, and testing. Directly developing control and sensor interface circuitry.
- ◇ **Senior Hardware Dev. Electrical Engineer**, SpaceX *August 2017–Sept. 2017*
- ◇ **Hardware Development Electrical Engineer** *July 2013–August 2017*
 - *Lead Hardware Engineer for Falcon and Dragon GPS systems*
 - Redesigned flight-critical GPS receivers, used on the Dragon 2 spacecraft and the next generation Falcon 9 rocket.
 - New design was 10 times smaller with improved integration, testability, and insight. Per-unit cost was reduced by over 50 percent.
 - Coordinated with vehicle-level teams to test prototypes on Falcon 9 launches.
 - Drove design from initial architecture trades through schematic capture, layout, characterization, and qualification.
 - Led a four-person team of software, hardware, and navigation engineers.
 - *Valve Driver Responsible Engineer*: Developed key load switching hardware for the Dragon 2 capsule, improving upon previous design density by a factor of four.
 - *Video Components Engineer*: Responsible for all video components on Falcon 9 for over ten flights (F9-6 through F9-20).
- ◇ **Dragon Operator**, SpaceX *May 2014–September 2017*
 - *Mission Director* (Phasing and Reentry, CRS-10/11/12 missions)
Operations lead during reentry. Final authority for all decisions during flight. Developed fault recovery plans which significantly reduced mission risk.
 - *Mission Director* (Berthed, CRS-8 mission)
Operator-in-command while attached to the International Space Station.
 - *Systems Operator* (Launch, CRS-7 and CRS-8 missions)
Responsible for all systems on Dragon (electrical, thermal, propulsion, life support, structural mechanisms). Performed on-orbit reconfiguration and setup.
 - *Avionics Systems Operator* (Reentry, CRS-5 mission)
- ◇ **Research Intern**, Mitsubishi Electric (Ofuna, Japan) *Jun 2012–Sept 2012*
 - Prototyped embedded graphics algorithms embedded in FPGAs
- ◇ **Research Intern**, Scherer Nanofabrication Group, Caltech *Jun 2010–Dec 2012*
 - Designed and taped-out several custom silicon neural probes (comprising a voltage-sensing frontend, a voltage-controlled oscillator, and output buffers)
 - Optimized circuits for super-low power usage (100s of μW)
- ◇ **Senior System Administrator**, Dabney House, Caltech *Feb 2010–June 2013*
 - Developed a medium-scale (100+ terabytes), easily-expandable storage system using commodity hardware and software
- ◇ **Research Intern**, Marsden CDS Group, Caltech *Jun 2009–Aug 2009*
 - Implemented fluid-metric computation software for GPUs using Nvidia CUDA

- SELECTED WORK EXPERIENCE
- ◇ **Laboratory Intern**, Bellan Plasma Group, Caltech *Jun 2007–Jun 2009*
Mentor: Paul Bellan, Professor of Applied Physics
 - Prototyped a pulsed magnetic field system using coils embedded on printed circuit boards, in order to allow quicker iteration on spheromak field configurations. System produced fields of up to 3 Tesla for 100ns.
- EDUCATION
- ◇ **California Institute of Technology**, Pasadena, CA *2009–2013*
BS, Electrical Engineering Emphasis on low-level digital and analog design
- SELECTED INDEPENDENT PROJECTS
- ◇ **Nuclear Fusion (Farnsworth Fusor)**
 - Successfully performed deuterium-deuterium fusion, produced neutrons
 - Built the vacuum system and high voltage (>20kV) equipment from scratch
 - Published a book, *Amateur Nuclear Fusion*, ISBN: 978-0-9791847-2-7, available via Amazon, which documents my experience
 - Documentation and photos available at <http://fusion.wsyntax.com>.
 - ◇ **FPGA-based FLAC decoder/player**
 - Developed a fully-integrated hardware FLAC decoding core, embedded AVR core, and peripherals (UART, SD card, DMA), resulting in a stand-alone FLAC player
 - Prototyped a from-scratch 2nd-order 1024x oversampling sigma-delta DAC with 0.1% total harmonic distortion + noise.
 - ◇ **Electrostatic Headphone Amplifier**
 - Prototyped an original design for high-voltage ($\pm 400\text{V}$) audio systems
 - First design in the audiophile literature known to apply high-gain global feedback, cancelling output buffer component variance
 - Low distortion (< 0.05%) and high frequency response (0–1MHz, $\pm 2\text{dB}$)
 - ◇ **Flying Experimental Aircraft**
 - Maintain and fly a 1981 Rutan VariEze as a private pilot
 - Patched and refinished several structural fiberglass layups
 - Flown a 4hr solo trip from Los Angeles to Santa Fe
- ASSORTED SKILLS
- ◇ **Operating Systems:** Linux/FreeBSD system administration
 - ◇ **Computer Languages:** Proficient in Python, C, Haskell; familiar with VHDL, LabView, \LaTeX , JavaScript (node.js, jQuery), bash, regexes
 - ◇ **Miscellaneous:** Scientific glassblowing, intermediate spoken Japanese, enemble taiko drumming, unicycling