Jacob Portukalian

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OBJECTIVE

Experienced manager, software engineer, and RF engineer, seeks growth oriented technical leadership position

EXPERIENCE

- **Zoox** Foster City, CA
  Staff Engineer *July 2020-Present*
    - **Program Lead**: Led program to produce an FGPA/Embedded Linux IMU emulator.
    - **Software Engineer**: Write and maintain software in C++ and Python for a wide range of applications.
    - **Embeddded Linux**: Building Linux images, configuration management, automated deploy systems.

- **Astra Space, Inc.** Alameda, CA
  Radio Systems Manager *May 2018-May 2020*
    - **Radio System Architect**: Designed rocket radio system from clean slate. Developed some novel architecture designs to support Astra's novel approach to a multi-stage rocket architecture.
    - **Manager**: Built cross-functional team of 3 people. Team handled all RF / mixed signal circuit design, PCB layout, bare metal C firmware, embedded Linux software, FPGA Verilog, Python for ground side software, all test software.
    - **Radio Systems - Avionics**: My team designed, built, and qualified the GPS and telemetry transmitters for the rocket. My team also has the firmware and software engineers to do all of the embedded coding and test software.
    - **Radio Systems - Ground Support Equipment**: My team at Astra has deigned, built, and tested a portable tracking station for receiving telemetry from the rocket. My team has designed and implemented the software that closed loop controls the dish to point at the rocket during flight.
    - **Verilog**: I Designed and implemented a Reed-Solomon encoder from first principles.

- **Sky Wave Design, LLC** Los Angeles, CA
  Chief Engineer *April 2014-Nov. 2015, June 2016-May 2018*
    - **Consulting**: Sky Wave Design was an embedded electronics development consulting business, focused primarily on embedded systems and Bluetooth Low Energy
    - **Firmware**: Expert level embedded firmware developer, especially with Bluetooth LE. Many firmware projects completed, including systems with complex state-machine behavior that is completely reconfigurable using configuration files. All firmware developed in C for bare metal processors.
    - **Circuit Design**: Designed many circuits, from complex sensor data acquisition platforms using a Raspberry Pi, to tiny BLE beacons designed to be embedded into a workplace environment for motion detection and reporting. All circuits designed in Altium.
    - **PCB Layout**: Many layouts performed, both for circuits that we designed in-house, and also some layouts performed on their own. Most complex example was a three PCB stack, each PCB with up to 16 layers, including a switching power supply, FPGA board, and RF transmitter board.
    - **Manufacturing**: Most circuits we design get taken all the way through to low volume manufacturing in quantities of up to 1000.

- **FORM Lifting** Los Angeles, CA
  Co-founder / CTO *June 2015-Nov. 2017*
    - **Circuit Design**: Designed a sensor board for a weightlifting collar that included a 6-axis accelerometer and a barometric altimeter. Wrote firmware to stream data back to phone using Bluetooth Low Energy.
    - **Manufacturing**: Produced 1,500 units. Built and programmed a fixture for automated testing and flashing. Had unit FCC/CE/IC/NZ/AUS certified.

- **Tyvak Nano-Satellites, Inc.** Irvine, CA
  Lead RF Engineer *Nov. 2015-June 2017*
  - **Lead RF Engineer**: As the lead RF engineer I was responsible for all RF development and performance. Duties included new radio designs, supporting off-the-shelf radio sourcing and integration, debugging, link budget maintenance, and system design.
  - **Manager**: Hired 2 RF engineers for team during my tenure. Team remained productive and brought our designs to market after I left.
  - **System Design**: Designed several systems, including bi-directional low power S-Band links, Space-to-Ground X-Band telemetry at both low and high data rates, a complete SAR RF chain, including 800W power amplifier.
  - **Transmitter Design**: Designed a complete X-Band transmitter. Developed PyQt GUI for controlling the radio to help automate bringup, test, and calibration.
  - **Antenna Design**: Designed deployable 1m S-Band dish that stowed to a 10cm cube. Designed several patch antennas. Designed helix antenna for UHF and also wrote Python code to take the pattern data and project it to the Earth's surface with an arbitrary rotation for ground coverage analysis. All designs simulated in HFSS.

- **Space Exploration Technologies** Hawthorne, CA
  Lead RF Engineer *Sep. 2011-March 2014*
  - **Crew Dragon**: Responsible engineer for designing and implementing the Crew Dragon communication system.
  - **RF Circuit Design**: Designed SDR transmitters and receivers, including upconveter and downconverter chains and selecting appropriate DACs/ADCs. Wrote Python scripts to optimize frequency planning. Designed several filters, both microstrip and lumped-element. Designed a high power PIN diode T/R switch.
  - **PCB Layout**: Over 10 PCB layouts for prototype and flight boards for transmitters and receivers.
  - **Power Amplifiers**: Designed several power amplifiers for UHF and S-Band using both LDMOS and GaN. Simulated in ADS. Achieved over 70% saturated drain efficiency for S-Band GaN PA. Designed a multi-PA phased array driver with feedback control on both phase and amplitude.
  - **Manufacturing**: Designed a test rack for automated transmitter testing.

- **Topanga Technologies** Canoga Park, CA
  Lead RF Engineer *Feb. 2010-Sep. 2011*
  - **Part Time**: Majority of employment at Topanga was part-time (30 hours/week) while attending UCLA with a full-time academic load.
  - **Firmware Development**: Developed a unique state-machine approach to plasma lighting algorithms. Designed a system where the algorithm was specified in a text file loaded by the firmware
  - **Circuit Design**: Designed a mixed-signal RF driver board that contained a microcontroller and RF source which excited and controlled a 170W UHF power amplifier. Designed a 5W driver amplifier using LDMOS.
  - **Desktop Software**: Developed a suite of applications in C++/Qt for monitoring and controlling drivers, data acquisition, database storage, automated inventory management, calibration, and characterization.

- **Floor 84 Studio** North Hollywood, CA
  Lead Game Engine Programmer *Feb. 2008-Dec. 2009*
  - **Game Engine**: Designed a 2D game engine for Nintendo DS in C++
  - **iOS Apps**: Developed several iOS games and apps

EDUCATION

- **University of California** Los Angeles, CA
  Bachelor of Science, Electrical Engineering *June 2011*

PATENTS

- MULTIPLE PULSE WIDTH MODULATION WAVEFORMS FOR PLASMA LAMP
  United States 8957593 Issued February 7, 2015

EXTRACURRICULARS

- **Aviation**: Private pilot with over 130 hours of flight time.
- **Backcountry Skiing**: New favorite outdoor activity! - Avi L1 certified
- **Backpacking**: Hiked the John Muir Trail, summer of 2017. 220 miles from Yosemite to Mt. Whitney.