



Charles Aylward

Embedded Systems Engineer



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About

Versatile engineer with broad experience spanning software, firmware, gateway, and hardware. Experience ranging from low-power embedded systems to HPC distributed systems of thousands of nodes. Significant experience with distributed control systems and sensor networks.

Experienced in mixed-signal board-level design, schematic capture, PCB layout, board bring-up, and bench testing. Familiar with design for manufacture (10K runs), power and signal integrity for high-speed designs, EMC, and FCC / UL certification. Designed electronics in Altium, KiCad, Eagle, and a handful of other ECAD suites.

Experienced in Linux development in both user- and kernel-space. Experienced in bare-metal firmware development on various platforms including applications, bootstraps, bootloaders, and board support packages.

Developed software in C, C++, Scala, Java, Python, Perl, and to a lesser extent, many others.

Familiar with FPGA design, simulation, and verification with Xilinx and Lattice toolchains. At home in any GNU environment.

Experience

- 2015-present Grizzly Peak Systems Principal Engineer, Freelance
Electronics / embedded systems design ("new space" avionics, consumer electronics, industrial control), concept-to-product. Sensor network design. Firmware, application software, embedded Linux. Real-time systems.
- 2017-2019 Astra Space, Inc. Principal Flight Software Engineer
Principal embedded software engineer and designer for first-generation orbital launch vehicle flight control systems (avionics). Helped produce what was very likely an all-time speed record from clean sheet to first launch license. Technical direction for flight SW team.
- 2016-2017 Whisker Labs, Earth Networks Embedded Systems Engineer
Developed hardware and software systems for innovative easy-to-install residential energy monitoring. Electronics design engineer responsible for schematic capture and PCB layout for several new board-level designs emphasizing design for manufacturing, test, and assembly. Embedded software developer responsible for first article microcontroller firmware and embedded Linux bring-up.
- 2012-2015 Twitter, Inc. Software Engineer
Developed the infrastructure for monitoring and analysis of the production service stack: application instrumentation libraries, complete metrics pipeline, time series databases (petabytes), and query languages. Worked on operating systems, kernel drivers, JVM performance analysis, and container standards and related technologies.
- 1999-2010 Additional Experience
Information on additional experience available at <http://www.linkedin.com/in/charlesaylward>

Other Frequently Used Skills

- Lab / bench testing and debugging with oscilloscopes, logic analyzers, spectrum analyzers, programmable dynamic loads, occasionally a Helmholtz coil, etc.
- Circuit and power delivery network simulation
- SMT PCBA assembly, testing, and rework
- MCAD for the design of electronics test fixtures (bed of nails, flying probes), aluminum enclosures, heat frames, basic sheet metal structures, etc.
- Linux device driver development
- Custom gateway IP development in Verilog (less often, VHDL)
- Technical program planning and management
- Technical writing
- Writing compilers, byte-code interpreters, optimizers, query language parsers

Other Projects and Interests

- Design and fabrication of observation-class sub-sea ROVs (structural, propulsion, navigation and control, sensor payloads).
- Autonomous systems, artificial intelligence (computational behavior and biomimicry, not ML), anomaly detection, modeling and simulation, space exploration, and cosmology.