

Micah T. Boswell

micah@bswll.net

(540) 641-2645

linkedin.com/in/micahtboswell

EDUCATION

Bachelor of Science, Computer Engineering, Virginia Tech

Blacksburg, VA

August 2012

EXPERIENCE

Embedded Systems Engineer, Stress Engineering Services

Mason, OH

December 2019 – December 2022

- Worked on more than a dozen projects for various customers in the consumer, medical, and industrial markets.
- Designed schematics and PCBs for many projects, including resolving supply chain and bringing up prototypes. (Altium, Altium 365, ARM Cortex-M and Cortex-A, Interface and Power Design, etc.)
- Designed and implemented firmware for many projects, including architecture, testing, and deployment. (C, C++, Linux, Microchip, TI, Nordic, FreeRTOS, etc.)
- Designed and prototyped a custom hardware module to replace an off-the-shelf image processor to resolve a supply chain issue for a high production volume device.
 - Worked with manufacturers and distributors to identify components and suppliers that would be able to meet demand during global supply shortage.
 - Hardware design with ARM Cortex-A7, parallel camera interface, UART, power interface and control, application specific power boost circuit design, custom programming fixture. (Altium)
 - Platform software design with custom flash image with configured Linux kernel, TFA, Uboot, and Busybox.
 - Custom Linux drivers and device tree, application software in C++.
 - Benchmarking and optimization for size, power, and performance.
- Designed schematic and firmware for battery-powered internet-connected consumer usage tracking devices and assisted with manufacturing and deployment of 2,000 devices. (Altium, ARM Cortex-M4F, C++, LTE Cellular, Sensors/I²C/SPI, Battery Management and Simulation, Design Testing, Assembly Work Instructions, End-of-Line testing, Fleet Management)
- Analyzed performance of a novel electrical medical sensor for FDA re-cert. Produced a custom calibration fixture, interpreted simulation results, and performed measurements to validate simulation. (Sensors, Calibration, Oscilloscope, LCR, Arduino)

Micah T. Boswell

- Analyzed design and performance of medical device electronics, firmware, and enclosure assembly through several stages of DFM and Beta Testing. (Failure Analysis, C, PCBA, Manufacturing, ISO-60601)
- Designed and produced several prototypes for battery-powered internet-connected GPS tracking devices from concept through several design iterations. (PCBA, Firmware, Enclosures, Testing)
- Wrote system architecture documentation for medical systems for certification purposes.
- Updated design (for manufacturability) of medical device using novel “software-free” design techniques with programmable analog circuitry and CPLD.

Software Engineer, Makino

Mason, OH

June 2019 – October 2019

- Developed software for interfacing between voice control platform and CNC machine tools. (C# .NET)
- Designed and implemented automated integration testing framework for end-to-end testing of voice control platform and application, as well as automated data collection from human interface testing, comprehensive test analytics, automated machine and simulation configuration, multi-lingual testing, and more. (PS .NET)
- Automated unified software build and deployment, including field update process, for five series of target systems in seven languages. (Git, msbuild, PS.NET, Inno Setup)
- Worked with Makino and Fanuc machine tool APIs. (MML, MEL, FOCAS)
- Worked with speech recognition technology (MS SAPI, SRGS) for multi-lingual voice control application.

Sr. Systems/Software/Electrical Engineer, Aquabotix

Fall River, MA

September 2017 – March 2019

- Led development of hybrid ROV/AUV vehicle software platform. (Linux, C++, ROS, Python, AVR)
- Developed robust 3D control algorithms for underwater vehicles with arbitrary thruster placement. Demonstrated at Oceanology International 2018. Rated by tech partner as better than competitor’s solution.
- Implemented web-based interface for real-time vehicle control and monitoring. (JS, WebSocket) Developed low latency and low bandwidth video streaming solution for web interface (H.264 hardware encoding, container-less video stream). Also demonstrated at Oceanology International 2018 with live control of an ROV from 3,300 miles away.
- Developed universal payload electrical interface to reduce connections and electronics complexity. Implemented framework for user configuration of vehicle platforms via web interface. This allowed customers to install and configure new payload hardware themselves, which previously required a tech visit.
- Developed autonomous planning and control algorithms for AUV. Demonstrated at ANTX 2018.
- Integrated payloads, including USBL, SBL, various sonars, environmental sensors, water sampler.

Micah T. Boswell

- Integrated sensor and payload electrical interfaces, including RS-232/485/422, I2C, Ethernet, USB.
- Field tested integrated AUV platform in both controlled and natural environments.
- Coordinated with vendors and contractors to meet system and delivery requirements.
- Provided engineering support for customers with fielded products.
- Created acoustic C2 and telemetry low-bandwidth data interface for AUVs.
- Developed mission autonomy and user interface software for swarm of diving ASVs. (ROS, Qt Embedded, SCXML, Node.JS, React.JS, OpenLayers)
- Maintained and improved firmware for microcontroller controlling diving ASV platform. (Microchip PIC32, FreeRTOS)
- Developed sophisticated build and deployment system that could automatically cross-compile and build custom hardened Linux images with dependency-based package management for ROS and Python packages and deploy incremental OTA updates in via development or release deployment pathways with minimal change updates or release-spanning signed update packages for end-user-facilitated updates. System also supported atomic system updates with automatic rollback, in-stride OTA development updates, and generating incremental update images from previously deployed system images. (bash, ROS, Python, dpkg, pip, openssh, openssl)
- Devised a method of hosting slippy map tiles on a low-SWAP system without incurring the overhead of managing millions of static files or spending processing power extracting them from a database on the fly. End users were able to easily upload new maps to their vehicle for offline use in the vehicle control web interface.

Software Engineer, General Dynamics Mission Systems

McLeansville, NC

August 2015 – August 2017

- Developed unmanned vehicle autonomy software architecture and components, as well as behavioral algorithms and distributed processing (Java, C++, Linux, UML, MOOS-IvP, Maven, Make).
- Designed and tested electronics hardware for software-free mil-spec wireless control system.
- Created simulated vehicle platform and simulation analysis GUI (Java, DIS). Integrated with controller hardware.
- Integrated C/C++ software in ARM SoC based micro-UUV payloads for cross-domain communication between autonomous vehicles (RF and ACOMMS).
- Integrated multiple third-party APIs into a complex software system despite conflicting requirements, complex interfaces, and multiple software languages, platforms, and architectures.
- Developed and maintained code generation technology for rapid development and integration.
- Developed Linux driver for side-scan sonar system (C/C++).
- Worked with distributed middlewares DDS, DIS, MOOS, JAUS, ROS, SOMA, and Goby.

Micah T. Boswell

Electrical Engineer, S34A Inc.

Troutville, VA

August 2014 – August 2015

- Developed software in C for ARM-based device designed to extract data from in-live-circuit NAND flash chips and write the data to local USB storage or to a PC via Ethernet or USB.
- Reverse engineered and wrote a Linux device driver for a poorly-documented NAND flash controller. Driver outperformed OEM driver by 30-200% and added support for many more chips.
- Developed drivers for custom hardware utilizing SPI, I2C, shift registers, decoders, ADCs, fault-tolerance, input switching, variable-voltage logic, logic gates, over-current and short-circuit protection.
- Designed hardware modifications for addition of ONFI-DDR/Toggle flash interface feature.
- Developed driver compatibility with NAND flash chips from all manufacturers by reverse engineering legacy NAND chip samples and undocumented portions of the flash controller using a logic analyzer and methodic experimentation.
- Reverse engineered Toshiba/JEDEC Toggle 2.0 interface with no available documentation.
- Identified and verified bugs in third-party flash chip readers.
- Tested and developed custom logic probes for in-circuit TSOP-48 chips. Used microscopes and oscilloscopes to evaluate connection performance, durability, reliability, and user friendliness.
- Reverse-engineered NAND chip manufacturer codes to add support for future NAND chip releases.
- Integrated software support for various hardware configurations for reading NOR, SRAM, etc.
- Redeveloped end-user graphical interfaces for Windows (C#.NET) and Linux (Python/TkInter) to allow easy access to device functions and capabilities.
- Optimized an algorithm for identifying latent data in an SSD's over-provisioning space based on raw chip reads (bypassing opaque Flash Translation Layer to extract data hidden by the FTL). Data processing run-time reduced from 4 days to 1 hour. Optimized algorithm now patented (US20150331743A1).
- Developed algorithms and tools for reverse-engineering the Flash Translation Layer algorithms used by flash controllers from several different manufacturers, including whitening, striping, error-correction, and other wear-leveling FTL algorithms.
- Performed assembly and testing of device prior to shipping.
- Wrote hardware and software documentation for forensic investigators.

Application Developer, HelioText Inc.

Blacksburg, VA

June 2013 – August 2014

- Developed data mining and statistical text analysis applications (Python) with web-based front ends.

Micah T. Boswell

- Refined patented algorithms for essay analysis for matching students with suitable university programs.
- Improved performance of proprietary data-processing software backend by a factor of 50 in a restricted data environment with limited resources.

Team Captain, VT Autonomous Underwater Vehicle Team, Virginia Tech

Blacksburg, VA

Fall 2008 – Spring 2011

- Managed team of 20+ engineering students for six consecutive semesters.
- Wrote software for AUV, including application framework and hardware interfaces.
- Designed electrical and mechanical systems, including motor control, power distribution and management, sensor interfaces, power and data umbilical, pressure vessel, etc.
- Directed construction of two AUVs bound for international competition.
- Led team at 2009 and 2010 AUVSI & ONR international AUV competitions.
- Software development included controls, computer vision, device drivers, fault-tolerant networking, sensors, state estimation, user interface design, modular application framework development, distributed computing for collaborative control, and a custom scripting language for rapid dynamic state transition development.
- Also wrote software in C for PIC microprocessors and wrote hardware in Verilog for Altera and Xilinx FPGAs (See LinkedIn profile for more details).

E-Commerce Software Developer, VisualCMG

Roanoke, VA

June 2006 – May 2008

- Developed a software platform for easy creation of e-commerce websites for a parts distributor's dealer network. (PHP, Apache, MySQL)
- Implemented web pages based on graphic designs. (HTML, CSS, PHP)