JOSHUA DAVID BUTLER

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SUMMARY

Highly experienced technology leader with 20+ years in software development, hardware-software integration, and startup leadership. Expert in embedded systems, AI/ML implementation, and R&D innovation. Passionate advocate for AI-driven engineering methodologies, consistently improving software production throughput by 10-20x. Proven track record of building and leading technical teams across multiple industries. Lifelong learner with deep cross-disciplinary engineering expertise, further accelerated by recent advancements in large language models and continuous AI workflow integrations.

PROFESSIONAL EXPERIENCE

CATALYPT, Oakland, CA

Founder & CEO | 10/2022 – Present

- Founded AI-first technology consultancy focused on helping businesses implement transformative AI solutions
- Developed proprietary frameworks for AI integration that consistently deliver 5-20x productivity improvements
- Led R&D initiatives exploring novel applications of large language models in software development and automation
- Architected and implemented custom AI solutions for clients across legal, education, software development, and research sectors
- Provided fractional CTO services to startups and established companies, guiding technical strategy and implementation
- Built and mentored high-performing technical teams, establishing best practices for AI-augmented software development

STERIS, Richmond, CA

Embedded Systems Specialist – Operating Room Integration | 3/2022 – Present

- Resolved critical video and fiber optic system issues in medical equipment deployed in operating rooms nationwide
- Engineered firmware and hardware solutions for PIC microcontrollers and embedded Linux systems, enhancing reliability and performance
- Developed custom testing frameworks for validating hardware-software integration and legacy product improvements
- Strategically managed component obsolescence, qualifying alternative parts amidst global supply chain disruptions
- Diagnosed and optimized firmware to enhance system reliability, significantly improving healthcare outcomes
- Introduced advanced AI-driven code generation methodologies, increasing development throughput by 10-20x for many tasks

VACTRONIX SCIENTIFIC, Fremont, CA

Technical Development Manager / Electrical and Software Development Engineer | 5/2021 – 9/2022

- Directed the development and integration of sophisticated physical vapor deposition equipment from prototype to production
- Led cross-functional R&D teams in developing innovative solutions for manufacturing challenges
- Automated precision gantry systems for improved manufacturing process control and less manual effort
- Enhanced HMI and PLC interfaces, delivering improved user experience and extended operational capabilities with ultra-low latency and real-time operation
- Redesigned hardware, firmware, and software toolchains to address supply-chain constraints, reduce maintenance demands and costs, and extend equipment lifetime
- Developed advanced embedded system platforms supporting remote diagnostics and control

INTEVAC, Santa Clara, CA

Hardware and Firmware Development Engineer – Military Night Vision | 7/2020 – 6/2021

- Executed comprehensive PCB bring-up procedures with Altium Designer, validating and tuning high-voltage power supplies by adding automated parameter sweeps and self-calibrating feedback loops
- Developed robust firmware in C++, Python, and MATLAB for STM32 and ESP32 controller to address precise military design requirements and complex manufacturing workflows
- Optimized sophisticated low-light camera component design and manufacturing technologies supporting DoD applications
- Ensured compliance with stringent AS9100, ISO9001, and NIST documentation and security standards

FESTO, Livermore, CA

Research Engineer / Applications Engineer – Medical Devices | 6/2015 – 2/2020

- Led R&D initiatives for next-generation medical diagnostic platforms, from concept to prototype
- Engineered embedded, PLC-based closed-loop control systems for automated medical diagnostic platforms
- Deployed and validated machine learning algorithms for industrial automation, including image processing and OCR technologies
- Integrated piezoelectric pneumatic, electrical, and hydraulic components into complex electro-mechanical systems for precise process control
- Developed embedded logic and signal processing algorithms using C++, Python, and MATLAB
- Prototyped advanced market-ready medical devices and developed production-support quality testing systems

EARLY CAREER STARTUP EXPERIENCE

Technical Co-founder / CTO | Various Startups | 2008 – 2015

- Co-founded and led technical development for multiple early-stage technology startups
- Architected and implemented full-stack software solutions for web and mobile applications
- Developed custom software for data analysis, visualization, and machine learning applications
- Built and managed distributed development teams, establishing agile development practices
- Secured seed funding through successful pitch presentations and technical demonstrations
- Guided product development from concept to market, pivoting based on user feedback and market demands

EDUCATION

- **PhD (ABD)—Electrical Engineering** | University of Cincinnati
  - Concentration: Advanced Algorithms and Systems Integration for Point-of-Care Medical Devices
- **Extensive Graduate-level Study** | University of Louisville
  - Biomedical Engineering, Embedded Systems, and Advanced Programming
- **Bachelor of Science—Electrical Engineering; Physics Minor** | Rose-Hulman Institute of Technology

TECHNICAL SKILLS

Software Development: - Full-stack development with JavaScript/TypeScript, React, Node.js, Python, and Django - Cloud architecture and deployment on AWS, Azure, and Google Cloud - Database design and optimization with SQL and NoSQL solutions - DevOps practices including CI/CD pipelines, containerization, and infrastructure as code

Embedded Systems & Firmware: - Expertise with PIC, STM32, ESP32, Arduino microcontrollers, some experience in FPGAs - Proficient in RTOS, state machines, real-time systems, distributed real-time automation - Skilled in I2C, SPI, UART, CAN bus communication protocols

Hardware Integration: - PCB design and troubleshooting using Altium and OrCAD, among other software and testing packages - Comprehensive component selection, validation, system and process optimization, and EOL-related redesigns - Electro-mechanical systems integration and debugging with extensive SolidWorks modeling for FEA

Programming & AI/ML: - Extensive experience in C/C++, Python, MATLAB, JavaScript/TypeScript - Expert in machine learning frameworks: TensorFlow, PyTorch, scikit-learn - Edge deployment of optimized AI/ML models for real-time control and automation - Experience as AI systems architect, training teams to leverage AI-driven code generation for 10-20x productivity gains

Research & Development: - Leading cross-functional R&D teams from concept to prototype to production - Designing and implementing experimental protocols

and validation methodologies - Patent development and intellectual property strategy - Technical writing and documentation for both technical and non-technical audiences

Leadership & Management: - Startup leadership and technical team building - Product strategy and roadmap development - Technical project management and resource allocation - Investor relations and technical pitch development

Standards Compliance: - ISO 9001/13485 Quality Management Systems - AS9100 Aerospace Standards - NIST SP 800-53/800-171 Security Frameworks - IEC Safety Standards (60601, 61010, 61131-3)

Design & Simulation Tools: - SolidWorks, AutoCAD, COMSOL Multiphysics - MATLAB/Python-based finite element modeling, derivative analysis, least-squares optimization, and advanced mathematical processing and analysis methods

PATENTS & RESEARCH

- Awarded multiple patents in microorganismal growth control and biological processing technologies
- Developed modified-air dehydration methods enhancing nutritional quality in personalized nutrition applications
- Published research on embedded systems for medical diagnostics and AI-driven automation
- Contributed to open-source software projects in machine learning and embedded systems domains