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# 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