



## Jesse Tucker

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### Summary

Electrical and computer engineer by training with broad technical and scientific background and an entrepreneurial spirit. Experienced at and comfortable in cultures ranging from startups to large corporate to academic. Thrives on new experiences, giving, collaborating, and getting the job done.

### Education

[George Mason University, Fairfax VA](#)

BS, MS, PhD Electrical and Computer Engineering

### Relevant Experience

[Tucker Labs, Inc. - Youngsville NC](#)

January 2019 – Current

Contract product development services, focused on small business startup product development needs. PCB design, regulatory compliance consulting, embedded programming, and full system architecture development. Includes a focus on developing engineering best practices within the startup. Wide ranging projects have included Optical Coherence Tomography system development with regulatory compliance passage; advanced SLD driver PCB development; embedded firmware development for advanced conveyor belt system logistics.

[Sense Photonics, Inc., Research Triangle Park NC – Director of Product](#)

May 2018 – October 2018

Product design director for next generation LIDAR systems in the industrial automation and self-driving automotive markets. Led team of optical, electrical, mechanical, system and regulatory compliance engineers. Organize and accelerate product maturity from proof-of-concept prototypes to manufacturable product available in a catalog. Maintained a deep technical understanding of all product technology aspects (optics, mechanics, electronics, regulatory) to most effectively reduce product development risks. Worked side by side with engineers to design and troubleshoot open issues and communicate high level progress to executives.

[Valencell, Inc., Raleigh NC – CTO / VP Engineering / Co-Founder](#)

Sept 2006 – Oct 2017

Co-founder of startup business that helped create the wearables market (invented the wrist heart rate sensors you see on popular watches and fitness bands). Responsible for all hardware research, product development

and manufacturing as well as product road-mapping and contributions to the IP filing and enforcement strategy. Valencell began as a research focused startup. At this stage, we wrote several SBIR/STTR grants and I was technical lead on the wins (NSF, NIH). I designed and built all early prototypes (PCBs, rigid/flex, mechanical enclosures, firmware, etc.) Valencell became a technology licensing company based on heart rate monitoring optical sensor technologies for both ear and wrist. I built and managed the hardware engineering team to meet our licensees' needs. The team was responsible for hardware product design and development, operations (quality / sourcing / contract manufacturers), and product management. The engineering team managed multiple joint product development efforts with several Tier 1 international customers such as Sony, Jabra, Bose, HTC, Garmin, Samsung, and several others. Built the company's supply and sourcing vendor network through various partnership negotiations. Created supplier certification programs for contract manufacturers as well as a secure distribution networks for proprietary hardware/firmware elements. Instantiated multiple company-wide productivity processes and tools for mass manufacturing (QA, CRM, PLM, ERP, "Agile-lite", Doc control, etc.). Supported marketing efforts via demo kit creation, marketing documentation, technology demonstrations for sales, personally manned trade shows (ie. CES) and regularly gathered voice of customer.

### General Electric Global Research Center, Schenectady NY – Research Scientist

June 2001 – Sept 2006

Principal investigator and/or technical lead on various wide bandgap semiconductor research programs. This involved contributing and/or managing teams of scientists and technicians in the development, design, fabrication and characterization of SiC 3kV thyristors, GaN HEMTs and SiC MESFETs for Lockheed Martin, SiC-based logic components and circuits for the DARPA RIPE program, SiC gas sensors for NOx emission for GE Energy CEO programs, and study of optically triggered power devices for AFRL Fly-by-light program. Several other programs, including build-up of automated wafer probe and MTTF test lab and clean-room advocate. Built multiple test circuits to demonstrate the performance and reliability of these new components.

### George Mason University, Fairfax VA – Graduate Research Assistant

January 1998 – June 2001

Designed and executed experiments and published findings relating to semiconductor physics. Built a cleanroom and created/taught University's first semiconductor processing lab course. Taught various electronics and robotics labs. Fabricated and characterized wide bandgap semiconductor devices for high power, high frequency, and high temperature / harsh environment applications. Performed partner experiments with various outside labs including Naval Research Lab in DC and commercial entities.

### Young Design, Falls Church VA – RF Electrical Engineer

January 1995- January 1998

Design, program, test, troubleshoot, document, and field support of RF and digital wireless data communication products primarily in the ISM bands. Design tools include schematic capture using ORCAD toolset, PCB layout, firmware and software programming in C,C++. Organize programmers, engineers, outsourcing of PCB manufacturers and component vendors to develop product in a fast-paced, small business

atmosphere. Perform on-site installations or repairs of data communication systems. Write Q.C. procedures, user operating and service manuals, and product specifications. Trained technicians.

## **Other related accomplishments**

- Many patents granted and peer-reviewed journal articles published.
- GE Six Sigma green belt certified.
- Taught GE Research Edison master's level course on semiconductor processing for three years.
- Won peer-reviewed innovation contest (MNST) at GE Research Center twice in the fields of microfluidics and semiconductor packaging.

## **Additional skills**

- Ansys, Matlab, etc. advanced modeling of thermal / electrical / mechanical systems
- Proficient with embedded firmware design in C/C++ for ARM, ATMEL, PIC, etc.
- Circuit board rigid and rigid/flex PCB design expertise primarily with Altium, also EagleCAD, others
- Circuit and firmware design for RF, digital, analog, sensors and PWM motor control circuitry
- Experience with most communication protocols, such as I2C, SPI, UART, TCP/IP, RS-485, etc.
- Proficient with small scale and testbed software design with Python, Labview, C++, etc.
- Experience with both Bluetooth and Bluetooth Low Energy (BLE) design and programming
- Expert experience with gas detection and optical sensors such as NOx, VOC, SOx, UV, IR, etc.
- In-depth experience with embedded programming of motor controller and sensor algorithms.
- Familiarity with most certifications testing for electronics based systems (UL, CE, etc.)
- Maintain a well-furnished electronics lab in Wake Forest, NC to accommodate PCB design, assembly, test as well as embedded development and test. Many local resources to support additional rapid prototyping as needed. Access to a wide range of local engineering talent.