# JOSHUA LUNN

Active Top Secret Clearance
Flowood, MS 39232| 478.787.7875
joshua.d.lunn@gmail.com | https://www.linkedin.com/in/joshua-lunn/

## CAREER SUMMARY

**Embedded Software Engineer • Engineering Manager • Director of Engineering**

*An empathetic technical leader and embedded software engineer with over 17 years of experience leading and enabling teams to solve complex technical problems with software and hardware solutions.*

***"Not everyone can work effectively from a remote location, but Josh was just as productive as if he were in the same room" – Joseph Fitzgerald, Tesla Government***

## AREAS OF EXPERTISE

- Embedded Linux development
- Firmware development
- Sensor Integration
- I2C/SPI/UART
- C/C++, Python
- Technical leadership
- Board bring up
- Debugging
- Schematics
- RTOS, FreeRTOS
- AI/ML Solution Development
- Image Processing / CV
- Video Streaming
- Wireless - BLE, LoRa, WiFi, Cellular, Sub-GHz, Mesh

## PROFESSIONAL EXPERIENCE

**Tactacam**, Billings, MT **February 2024 – Present**

*Camera company building battery-operated cellular and WiFi cameras for hunting, surveillance, and bird watching.*

**Sr Embedded Engineer**

As part of a cross-disciplinary team of hardware and embedded firmware engineers, we are developing a platform for next-generation cameras, optimizing cost, battery life, and image quality.

- ***Embedded Linux Development***
  - *Developed a platform to allow applications to move between different SoCs and other hardware quickly (Buildroot, U-boot, kernel, device tree, c, fast boot)*
- ***Edge AI***
  - ***o*** *Introduced AI model running at the edge to improve customer experience with object detection and limit network traffic with reduced false triggers*
- ***ISP***
  - *Led investigations into methods to improve image and video quality while reducing network traffic (3A, hardware-accelerated compression, video encoder pipelines)*
- ***ODM Support***
  - *Supported outside development and manufacturing, including firmware reviews, issue investigation, and testing.*

**CSLabs**, Alexandria, VA **July 2022 – February 2024**

*Modeling and simulation company specializing in machine learning, sensors, and physics-based analysis.*

**Lead Software Engineer**

Recruited to add product development expertise, help grow the software development team, improve development processes, and support contracts as a lead software engineer.

- ***AI/ML application development***
    - Created an application to automate a manual video processing workflow using OpenCV and YOLOv8, detected and coordinated events across multiple video streams, and used detected contours and locations as input to an XGBoost regression model to predict spatial measurements (Python, OpenCV)
    - Developed an application based on a fine-tuned LLM to perform multimodality classification and similarity searching (Pytorch, Langchain, ChromaDB)
- ***Project Manager/Lead SW Engineer for multiple SBIR contracts totaling over 2M***
- ***OPSEC process development***

**Kopis Mobile**, Flowood, MS **January 2013 – June 2022**

*Defense-focused start-up founded to provide software and rugged electronics to those who keep our Nation safe.*

**Director of Engineering** **October 2017 – June 2022**

Success in managing the software team allowed me to move into a position to manage the entire engineering team. Our growing engineering team comprised software, computer, electrical, and mechanical engineers.

- ***Used a variation of SCRUM to unify the cross-functional team*** to align and execute multiple simultaneous projects
- ***Built a culture of high trust and emotional safety*** through 1-on-1s and retrospectives
- ***Managed team of ten executing on contracts resulting in 3M+ yearly revenue***
- ***Created a UI/UX team*** *to build simple, intuitive interfaces for complex software and hardware solutions*

**Engineering Manager - Software** **January 2017 – October 2017**

Once our team had grown to a couple of engineers, it became clear we needed some management processes. I took on the engineering manager role and implemented best practices for managing an agile software team. Our team grew to include mobile application developers, web developers, and firmware developers.

- ***Built team to five engineers executing on 2M+ in contracts*** as well as supporting our internal R&D efforts
- ***Implemented 1-on-1s to build better connections with team members*** and understand how the company and I could better support them

- ***Honed our software development process to increase efficiency*** by establishing a unified branching model, unit testing, code reviews, CI/CD, feature definitions, and definition of done
- ***Developed our Co-op program*** to recruit and train top talent and create a pipeline of qualified candidates

**Software Engineer** **January 2013 – December 2016**

Co-founder and first software resource in the startup

- ***Developed a man-wearable Embedded Linux device*** that captured and streamed first-person video through a wireless mesh (i.MX6, Buildroot, U-Boot, GStreamer, C++, Python, WiFi Mesh)
- ***Developed a wireless rugged dongle*** *to enable real-time wireless readings from CBRNE sensors (STM32F, FreeRTOS, LoRa, LoRaWAN, UART, USB, I2C, SPI, IoT)*
- ***Developed custom mesh protocol*** *for syncing helmet-mounted multi-spectrum light emitters (CC1101, STM32F, FreeRTOS)*
- ***Developed several Android and iOS applications for military users,*** *including a sniper ballistic calculator, metal detector training tool, and Bluetooth control app for helmet-mounted light emitters (Java, Objective-C)*

**Mav6**, Vicksburg, MS **May 2012 – December 2012**

*Department of Defense contractor developing software and hardware*

**Software Developer**

Recruited to bring commercial software development experience to a traditional government contractor. Initially, I performed on a contract developing Java software for a NASA Worldwind-based geospatial application for RF propagation modeling, and later, I moved to develop firmware for a prototype metal detector.

- ***Accepted job offer with little experience in Java,*** *and quickly learned on my own time between accepting the job offer and starting so I could hit the ground running*

> *He was relatively new to Java at the time, but had a firm grasp on software development concepts so his skills were transferable and he was able to hit the ground running and make big contributions to the project quickly. Josh is one of the faster developers I've worked with and he produces clean code.*
>
> *- Joseph Fitzgerald, Mav6*

**Heartland Micropayments**, Chattanooga, TN **May 2011 – May 2012**

*Created innovative payment processing solutions for micropayments such as vending and laundry*

**Intermediate Firmware Engineer**

Developed firmware for AT89C51 and ST32F family processors. Traveled to customer sites to perform upgrades, installs, and troubleshooting.

- **Increased customer satisfaction** by redesigning a legacy system that was difficult to support and use.
- ***Fought for customers and customer support personnel*** *to improve a system that the original developer didn't feel needed to improve*

**Yoogleshop**, Chattanooga, TN **March 2010 – May 2011**

*Online retailer specializing in second-hand cellular phones*

**Partner**

Developed software tools and managed cash flow, supplier relationships, and day-to-day operations of the business.

- ***Generated 1M+ yearly revenue with a limited staff using custom-developed software tools***

**SmartSynch Inc**, Jackson, MS **January 2008 – February 2010**

*Developed cellular-enabled smart electric meters to support electric utilities with smart grid implementations.*

**Senior Firmware Engineer**

I was recruited because my college senior design team designed and developed a cellular-enabled hunting camera. Using C and Nucleus RTOS, I developed firmware for 32-bit microprocessors that interfaced with electric meters and communicated via a cellular modem to the backend server.

- ***Developed firmware to run for 20+ years on 250k+ fielded devices***
- ***Cut ~$50 out of BoM cost on GSM cellular-enabled products*** by porting code to support a less feature-rich modem that costs significantly less.
- ***Cut time to "auto provision" from months to weeks*** by working with the firmware team to produce a common code base across all products.

## VOLUNTEER

**Mentor, Jackson State University**

Jackson, MS

- *Teach basic robotics to high schoolers in UNITE Summer Camp - Basic Motion, Sensors, SLAM, and ROS*
- *Developed IoT projects to introduce students to IoT, network security, and machine learning*

**Mentor, Wait For It FIRST Robotics Team**

Jackson, MS

- *Mentor team in the areas of programming, robotics, and embedded systems development to improve the team's performance in autonomous operations*

## EDUCATION

**Bachelor of Science, Electrical Engineering**

Mississippi State University, Starkville, MS

- *Developed a prototype of one of the first-ever cellular-enabled security cameras*

## PUBLICATIONS

Tan, John & Cao, Zhongren & Carlson, Lawrence & Barbieri, Louis & Lunn, Joshua. (2015). Modeling and Analysis of RF Propagation in Complex Environments.

## CERTIFICATIONS

Remote Pilot Certificate - FAA-Certified Drone Pilot