Brandon K Markham

(512) 636-1360 | brandonkeithmarkham@gmail.com
LinkedIn: www.linkedin.com/in/brandon-markham
GitHub: brandonkeithmarkham.github.io

Education
Texas State University
Bachelor of Science in Electrical and Computer Engineering

Skills
Core: VLSI, MATLAB, Object-Oriented Programming, Machine Learning, Object Detection
Software/Systems: Python (PyTorch, TensorFlow), C/C++, Linux/Unix
Hardware: Embedded Systems (RaspberryPi, ESP32, Arduino, ARM, FPGA)

Projects

PCB Defect Detection   August 2024 – May 2025
- Built an automated PCB defect detection system using transfer learning with YOLOv8, SSD MobileNet, and Faster R-CNN.
- Prepared and augmented a labeled PCB dataset (Pascal VOC XML) and converted it for multiple model pipelines.
- Achieved highest performance with YOLOv8 (~97% mAP), demonstrating strong feasibility for automated quality inspection.
- Implemented dimensionality-reduction visualizations (t-SNE, UMAP) and authored a comparative analysis report of all models.

Guitar Looper, Senior Design   August 2024 – May 2025
- Built a digital guitar looper pedal on the STM32 platform with real-time audio playback.
- Verified low-latency audio performance while balancing SD card storage efficiency.
- Implemented undo/redo limited to overdub layers while preserving the base recording.
- Designed save/load functionality in WAV format with reliable SDMMC + FatFS performance.
- Developed hardware I/O JFET buffers for impedance matching.

Carry Look Ahead Adder   January 2025 – May 2025
- Designed and implemented an 8-bit Carry Look-Ahead (CLA) adder.
- Verified functionality through logic-level, transistor-level, and post-layout simulations in LTSPICE and Microwind.
- Completed Microwind layout with DRC and performed post-layout timing analysis.
- Demonstrated faster carry computation compared to ripple-carry adders through simulation results.
- Built design from two modular 4-bit CLA blocks, enabling scalability for larger adders.