Max Kotas

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Professional Summary

Electrical Engineering graduate with hands-on experience in analog/digital circuit design, embedded systems, FPGA programming, and motor control systems. Adept at creating efficient hardware solutions and passionate about automation, robotics, and power electronics.

Education

Bachelor of Science in Electrical Engineering (Minor in Mathematics) Texas A&M University
Graduation: December 2024
Relevant Coursework: Digital System Design, Circuit Design, DSP, Operational Amplifiers, Microwave Systems, Electric Energy Conversion, Security of Embedded Systems, DSP-Based Motion Control

Technical Skills

Core Skills: Embedded Systems, Circuit Design (Analog/Digital), Control Systems, Motor Control, Power Electronics, DSP, RF Design
Programming: Embedded C/C++, Python, MATLAB, Verilog/VHDL
Tools: Code Composer Studio, Altium Designer, KiCad, MATLAB, Arduino IDE, Git
Platforms: TMS320 (Delfino), MSP430, ESP32, Raspberry Pi, Xilinx FPGAs

Notable Projects

For full project details, visit: **maxkotas.com**.

FPGA-Accelerated Embedded Neural Network *Spring 2025*
Skills: FPGA Acceleration, Neural Networks, HLS4ML, TensorFlow, QKeras
- Built an **FPGA-based neural network accelerator**, balancing low-latency inference with power efficiency.
- Developed a full pipeline: **data preprocessing**, training in TensorFlow, and quantization with QKeras.
- Used **HLS4ML** to generate synthesizable Verilog directly from the quantized model, enabling rapid hardware deployment.

BLDC Motor Control System *Fall 2025*
Skills: Embedded Systems, Real-Time Motor Control, DSP, Power Electronics
- Implemented six-step commutation for BLDC motor using the **TMS320F2837xD** in **Code Composer Studio**.
- Controlled H-bridges via **bitwise GPIO logic** and Hall-effect sensor feedback, ensuring accurate rotor position tracking.
- Designed custom digital logic for phase switching with optimal torque generation and **PI speed control**.

Spherical Rolling Robot PCB Project *Spring 2025*
Skills: PCB Design, Embedded Systems, Signal Integrity, Power Management, Control Systems
- Designed a custom multilayer PCB for a spherical rolling robot using advanced **KiCad** layout techniques.
- Integrated **ESP32**, **TB6612FNG dual H-bridge**, and **MPU6050 IMU**, enabling motor control and inertial sensing via **UART** and **I2C** buses.
- Optimized layout with careful trace routing, decoupling, and ground plane management to ensure signal integrity and noise immunity.

Professional Interests

Analog and Digital Circuit Design, Embedded System Development, Power Management ICs, Motor Control Systems, FPGA Implementation, Automation and Robotics

Community Engagement

Volunteer, Bryan Food Bank 2024 - Present
Collaborate in sorting, packing, and distributing resources to support community food distribution initiatives.