Z/K Zac Kilburn

Electrical Engineer

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LinkedIn

Website

ABOUT ME

I am an experienced engineer with hands-on learning on and off the job. I have a mixture of embedded software experience and electrical design experience that allows me to understand both domains and how they interact. I have a passion for learning and extensive experiential knowledge. I thrive when presented with a challenge and am persistent when finding a solution, finding it hard to quit until the problem has been resolved. I am ready to find a challenging position where I can bring my passion and exercise my curiosity.

EDUCATION

Bachelor Science Electrical Engineering

The University of Akron / 2012-2018

Computer Science

Case Western Reserve University / 2009-2011

SOFTWARE

PCB / Circuit Design

- Eagle
- Altium Nexus / Designer
- LTspice

Harness Design and Testing

- EasyPC
- Cami CableEye

ERP System

- Macola
- Agile

Office Tools

- Excel (with VBA)
- Word
- OpenOffice

3D CAD

- Solidworks

Software IDEs

- Xilinx Vivado
- Xilinx Vitis
- Xilinx HLS
- Visual Studio
- Android Studio
- Arduino
- MPLAB

Programming Languages

- C / C++ / C#
- VHDL / Verilog
- HTML / Javascript / CSS

PROGRAMMING

- Xilinx
- STM32
- PIC
- RTOS

EXPERIENCE

Sr. Electrical Engineer

IEC Infrared Systems / Middleburg Heights, OH / May 2018 – Current

Specializing in long range IR surveillance and remotely operated weapons platforms, IEC Infrared Systems designs highly customized solutions for DOD and government agencies

- Lead designer / project lead on multiple simultaneous projects
  - Developed next generation platform for HD video / IP Enabled systems
  - Sole electrical engineer on small form factor product line development
- Leadership
  - Interviewed prospective employees
  - Advised multiple disciplines of engineers on designs
  - Generated reference 3D models / board schematic / layouts / harnesses
- PCB Design
  - Extensive experience with Altium Nexus
  - Rapid turn prototype circuits for internal and production level use
  - FPGA schematic and layout
  - DDR schematic and layout
- Mechanical Design
  - Designed enclosures / fixtures for on-site 3D printing
  - Mock-up mechanical / electrical interfaces for space constrained design validation
- Software Design
  - Xilinx FPGA Verilog / VHDL / IP including GTX, Serdes, Clocking, AXI and others
  - GUI development for control pad control of weapons platform during testing
  - Low-level peripheral firmware for PCB power-on and function testing
  - Internal use website / database for design navigation and interlinking
- Product improvement and design modifications
  - Introduced automotive style harness assembly fixtures with integrated testing
  - Designed testing platform for general use with any PCBs developed
- Hands on Design and Documentation
  - Circuit diagnostics and troubleshooting
  - Electrical harness and cable drawings for production
  - System configuration drawings for production
  - System topology block diagrams for customers
  - Interdisciplinary work with Mechanical and Software subsystems
  - Prototype first article harness building, board assembly, product assembly
  - 0402, BGA, QFN, QFP and fine-pitch hot air and hand soldering experience
- Documentation / Testing / Validation
  - Engineering change order documentation
  - ISO9001 compliant documentation / procedures
  - Test fixture design and deployment for PCBs / Harnessing
  - Test platform design and deployment at system level
  - Test procedure development for component/product validation in production
  - Troubleshooting documentation for external repair depot

SKILLS

Communications Buses
- RS232/485
- UART
- I2C/SMBus
- SPI

Video Links
- HDMI
- Camera Link / LVDS

Memory Interfaces
- SDMMC / EMMC
- DDR
- AXI

PCB Rework
- SMT / Hot Air / Iron Soldering

Tools
- Oscilloscope
- Spectrum Analyzer
- Power Supplies
- Logic Analyzer
- Multimeter

PROJECTS

Senior Design Combat Robot
The University of Akron / San Mateo / 2018
- RoboGames competition
- Autonomous Operation with Neural Network
- Custom LIDAR solution
- 200lb Weight Class

FSAEE Formula One Electric
The University of Akron / 2013-2015
Link

BME Bike Brake
The University of Akron / 2018
Article

Portable Scoreboard
Personal Project / 2021-Current
Link

Firework Mortar Launcher
Personal Project / 2021-Current
Link

LEADERSHIP

NASA Robotic Mining Competition
The University of Akron / Kennedy Space Center 2013 - 2018

Interview Link

Lead University team to build mining robot for NASA competition in simulated regolith. Worked on autonomous operation for sensor fusion and path planning.
- 2013 - Team member software sub-team
- 2014 - Software Team Leader
- 2015 - 2017 – Team Leader
- 2018 – Software Team / Leadership support

REFERENCES

Available on Request

Project Engineer / Firmware Developer
Design Flux Technology / Akron, OH / March 2014 – May 2017
Founded as a spin-out company from The University of Akron, Design Flux Technology patented a novel dynamically reconfigurable energy source in 2014. Hired immediately after patent was approved and technology development began.

- Post patent development of technology
  - Cognicell technology
  - Battery cell reconfiguration at cell level
- Dynamic cell bypassing / reversal for circuit emulation without external modules
  - Variable voltage generation
  - High efficiency balance charging
  - MPPT operation
  - Inverter emulation
  - Charger emulation
- Technology Application Research
  - Met with potential clients and discussed technology applications
  - Developed core features of technology
  - Demonstrated technology to interested parties
  - Solely maintained location in Bounce Akron Innovation Hub
- Initial Tech Prototype Development
  - Constructed first demonstration unit to promote technology
  - Setup and performed long term solar integration providing data for analysis
  - Provided real world setup providing feedback for circuit improvement and iteration
- Provided software for embedded systems including:
  - ADC for voltage monitoring
  - Communications protocol for control and data gathering (UART / RS485)
  - MOSFET control circuitry
  - PIC / Atmel processors
  - Bluetooth
  - High Resolution Timing
  - AC waveform generation
  - High Power systems

Lead Firmware Developer
Essential Research / Twinsburg, OH / July 2013 – January 2014
Generating precision gas concentration sensors using new methodology, Essential Research aimed to reduce the cost and improve the sensitivity of existing CO_2 and NOX sensor devices

- Validated new sensor constructions
  - Constructed software system on custom PCB for sensor data collection
  - PID Control of heating element for 650°C operation for sensor operation
  - Provided feedback from sensor testing to influence construction techniques
- Setup gas flow test configurations
  - Constructed test setup with metered gas flow at varying concentrations
  - Modified software to calibrate sensors at varying conditions