Nathan E. Franczyk

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EDUCATION

University of Illinois at Urbana-Champaign, IL May 2019
Bachelor of Science in Electrical Engineering 3.41/4.00
Minor in Computer Science
Certified in Technology Commercialization

EXPERIENCE

University of Chicago Weizmann Research Group - *Lead Developer* Oct 2016 - Present
- Drafted a polymerase chain reaction (PCR) machine to implement the group's new DNA heating procedure
- Designed and assembled printed circuit boards to power the machine, monitor DNA quantity, and sense temperature in real time
- Programmed a microcontroller to execute PCR in Arduino and used Python to record results and process data
- Expanded ADC over SPI to increase the accuracy of measuring the PCR by 4 orders of magnitude

Ameren Illinois - *System Protection Engineering Intern* May 2017 - Aug 2017
- Led and developed three software automation projects that expedited projects by up to 5 months
- Programmed automation scripts to update excel databases for grid equipment in Python and VBA in Excel
- Issued protective equipment settings to protect substations and grid equipment from disastrous situations
- Created and corrected distribution and communication schematics and wiring diagrams
- Constructed logic diagrams for metering and line switching equipment to protect transformers from faults

LEADERSHIP AND ACTIVITIES

Flower Power Energy - *Cofounder* Oct 2015 - Dec 2016
- Cofounded a startup specializing in solar retrofits for portable gas generators to bring a sustainable energy source to developing countries
- Finalist in the Cozad Venture Competition, defeating over 120 startups
- Brainstormed, sketched, modeled, and animated retrofit designs using Autodesk Inventor
- Developed a business model canvas, calculated financial projections, and acquired potential customers
- Designed and built a minimal viable product for the Cozad competition showcasing the hybrid interaction of the gas and solar generators

Illini Solar Car - *Battery Team Member* Jan 2017 - May 2017
- Created and tested a setup for a thermistor circuit to monitor battery temperature
- Assembled battery housings by spot welding batteries to tab wires and soldering wires to PCBs

SKILLS

Programming Languages and Software Experience
C++, Matlab, C, VBA, Python, Arduino, HTML/CSS, Autodesk Eagle, Autodesk Fusion 360, Autodesk Inventor, Linux, Windows, Subversion, Git, LaTeX

Technical Skills
Circuit design, signal processing, programming, marketing, circuit analysis (oscilloscope and multi-meter), troubleshooting, entrepreneurship, soldering

PROJECT HIGHLIGHTS

Audio Denoising Apr 2017
- Wrote MATLAB programs to visualize frequency components of music in a spectrogram
- Made a Parks McCellan FIR software filter to remove noise almost entirely

AM Radio Nov 2016
- Created envelope detecting, filtering, and amplifying circuits for an AM radio
- Graphed frequency components at test points using oscilloscope to debug

Maze Creator and Solver Apr 2017
- Utilized disjoint sets and arrays to create a traditional NxN grid maze using C++
- Developed a breadth first search algorithm to solve the maze and produce the solution as a PNG

4x2 Shift Register Memory Aug 2017
- Implemented a memory system of 4 Address by 2 bits with loading, fetching, and storing capabilities
- Determined multiplexor I/O with Karnaugh maps to implement the 3 instructions