LUCY MOGLIA

Research Engineer

Greenville, South Carolina, US
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github | LinkedIn

Summary

I am interested in how systems work and how they fail. Electrical engineering is my focus, following from an abiding interest in systems theory/control theory met with a concrete desire to build systems. At Kyocera-AVX I have been reverse engineering a wide array of products, evalutating prototype components, and researching emerging application areas to assist our product development and market engineering teams.

Skills

Plasma physics/high voltage, Master

Tesla coil construciton *Inductively coupled plasma, RF plasma* *Marx geneator construction* *HV converter design (flyback, ZVS, LLC, Hbridge)* *HV interlock design* *Transient simulation and isolationn in HV systems* *High power waveguide design and simulation*

Electrical Engineering, Master

Circuit Design (AVX) *PDN Analysis (AVX)* *PCB Antenna/Filter Design* *Failure Mode Analysis (Electrolux)* *Equipment Design/Construction (AVX/ElectroLux)* *PCB Design (AVX/MG)* *PCB Assembly (AVX/MG/Electrolux)* *IEC Compliance Testing (Electrolux)* *Functional Testing/Debugging (AVX/MG/Electrolux)* *Prototype Evaluation (AVX)* *SPICE Modeling (AVX)*

Full-Stack Embedded Development, Advanced

C, C++, Arduino, Micropython Firmware Development (AVX/MG) *Circuit Design, PCB Design/CAD Design (AVX/MG)* *Instrumentation/Test Hardware Design* *Rapid Prototyping (AVX/Electrolux)* *STM8/32, ATMega/ATTiny, ESP8266/ESP32, RP2040, SAMD21/51, Teensy, PIC Microcontrollers* *Rapid Full Stack Turnaround Time (AVX)*

Manufacturing, Advanced

3D Printing (FDM, SLA/mSLA, SLS) *Direct laser writing and electrode patterning for biosensor and MEA fabrication* *Electroplating, electrodeposition, laser induced deposition* *General fabrication* *Light hand/CNC machining*

Research Engineering, Advanced

Teardowns (AVX) *Technical Report Composition (AVX)* *Market Research (AVX/MG)* *Reverse Engineering (AVX/MG)* *Prototype Evaluation (AVX/MG)*

Experience

Engineer @ Self Employed Hardware Designer ***(2024-10-15)***
San Francisco, CA, https://eigenlucy.com

PCB design, rapid prototyping, embedded devevlopment, RF performance testing, and more

Contracting and consulting work for an array of startups

- *Developed a number of demos which helped secure startups funding*
- *Rapid turnaround PCB design and testing*
- *Early stage hardware consulting, assiting founders in understanding their products techinical requiements*
- *Lab speccing, equipment recommendations, assistance configuriing machine profiles*
- *Performance analysis*
- *Failure mode analysis*

Research Fellow @ Atopile ***(2024-10-15)***
San Francisco, CA, https://docs.atopile.io/latest/

Built hardware with Atopile's domain specific lanugage for PCB design.

Software Defined Hardware Startup

- *Developed Micromppt, a 5W autonomous multi-chem solar charger with autonomous perturb-and-observe, now destributed by a number of third party sellers*
- *Developed a series of home assistant control panels*
- *Developed a high altiutude balloon payload with LoRa telemetry,*
- *Testing/debugging prototype features*

Research Engineering @ Kyocera-AVX ***(2023-04-01 - 2024-08-28)***
Fountain Inn, SC, https://www.kyocera-avx.com/

Kyocera-AVX is an American electronics component manufacturer specializing in passive components such as antennas, MLCCs, tantalum capacitors, supercapacitors, and varistors.

Electronics Component Manufacturer

- *Preformed teardowns on a wide variety of products and systems on behalf of market research and engineering teams.*
- *Reverse engineered systems to assist product design and market research teams, produced schematics and component models from product samples, evaluated samples annd prototype components to assess suitability for given products/applications of interest.*

Founder/Engineer @ Machinic Garden LLC ***(2022-10-01 - 2023-05-01)***
Liberty, SC

Contract Engineering and Manufacturing Services, Small-Scale Manufacturing

Small Scale Manufacturing and Contract Prototyping Services

- *Designed prototype PCBs to client specifications and designed processes to address specialty needs (e.g. copper nanopaticle airbrush coating and electroplating of 3D printed parts).*
- *Acquisition and integration of a wide variety of small scale manufacturing and test equipment including 3D printers, laser cutters, arc welders, drill presses, osciloscopes, CNC mills and reflow ovens.*
- *PCB Design (KiCAD, Fusion360)*
- *Managed a shop website and several storefronts such as Etsy and Amazon, mananged AdSense, and handled order processing and shippng for an array of products including t-shirts, laser engraved coasters/signs, 3D prints, and electronics kits.*
- *Full-Stack Embedded Development (C/C++, Micropython, Arduino, ATTiny, ARM Cortex M, STM32, ESP32/8266, Teensy, RP2040, SAMD21/51)*

Electronics Lab Technician @ Electrolux ***(2022-05-01 - 2022-10-31)***
Anderson, SC, https://www.electrolux.com/en/

Electrolux is an Swedish multinational home electronics manufacturer specializing in appliances such as fridges and washing machines.

Electronics Lab Technician

- *Assisted engineers in PCB and firmware development and validation.*
- *Preformed IEC/UL compliance testing, evaluated hardware and firmware revisions with LabVIEW, NI embedded PCs and custom Arduino based test hardware.*
- *Used OrCAD, LabVIEW, National Instruments PXI, and a wide array of electronics lab equipment.*
- *Assist4ed in development of EOL test fixtures*

Awards

OpenSauce 2025 Exhibtor ***(2024-06-14)***
San Mateo, California
OpenSauce, year two. This time we presented

OpenSauce 2024 Exhibtor ***(2024-06-14)***
Daly City, California
An event for engineers, student groups, open source developers, makers, and startups to exhibit something they've been working on. You hear my application on the Safety Third podcast here: https://www.youtube.com/watch?v=NeMPYlnSd-g&t=5884s

Volunteers

Volunteer @ Cleo Bailey Experiment ***(2020-05-01)***

https://www.cleobailey.org/

Community garden project in Anderson, SC. Provides food to local food banks, hosts community events, and actively working on renovations with the hope to host many additional resources

- *501c nonprofit organization. https://www.cleobailey.org/*
- *Coordinated with university student organizations and community groups to organize volunteer efforts and plan events.*
- *Managed and participated in the planning and construction of a wide array of construction, rennovation and gardening projects.*
- *Assorted gardeining, farmwork, construction, and fabrication work*
- *Assisted in the design and implementation of an array of low-cost, experimental construction and gardening methods, such as 'DIY' irrigation systems made from PVC pipes and low-cost rainwater collection/distrubution systems.*

Projects

Micromppt

application

https://eigenlucy.github.io/projects/micromppt/

Low-cost 5W autonomous solar charger with embedded perturb-and-observe set point adjustment

Power converters *Open source hardware* *Solar*

NonHumanScent, Artificial Olfaction

application

https://eigenlucy.github.io/projects/NonHumanScent/

Electronic olfaction, gas composition sensor design

Developed open source electronic olfaction dev kits *Presented to Ekkolapto Institute on scent computation (twice)*

Developed LIG electrode laser patterning techniques for custom gas composition sensor arrays

Contributed to the development of an scent context model

Cultured Neurons at Frontier Tower

application

https://eigenlucy.github.io/projects/mea_arrays/

Developing hardware for Frontier Tower's neurotech floor to read/write to cutlured neurons

Developing a maskless MEA fabircation process

Built biocompatible culture neuron headstage frame with fluid exchanger for neuron culturing

Developing custom acquisition board to replace overpriced Intan RHD system

NFC/LED Chip Implant

application

https://eigenlucy.github.io/projects/NFC_Implant/

Self-surgery to install an xSIID NFC/LED chip in the webbing of my left hand

RFID/NFC Hacking *Biohacking*

Voices In The Radio
application
https://github.com/eigenlucy/Voices-In-The-Radio-PUBLIC-
OS agnotstic GPT fine-tuning toolchain used in my OpenSauce 2024 exhibit. Automates scraping and processing large quantities of text from a variety of source filetypes, filtering this data with chunk distinctiveness scoring, and automating fine-tuning process via OpenAI's API. Additionally provides tools to automate the assignment of fine-tuned models to Discord bots, and assignment of a voice via eleven labs TTS API. Our OpenSauce booth included a terminal to interact with the models we trained this way, which would then speak at the user through a suite of FM radios with the use of an ESP32 and SI4713 FM Transmitter IC.
LLM Fine tuning *ChatGPT* *Python*

Languages

- English, C/C++, Python, HTML, Javascript

Interests

Interests
Mesh networks (OpenWRT, LoRaWAN, BLE Mesh, Reticulum) *Solar converters* *High Energy Physics/Plasma Physics/High Voltage* *Artificial Olfaction* *Mycology* *Applied ML for robotics* *RF engineering* *Wireless Power Transfer*

Open Science
Open-source hardware *Low cost, open source microelectrode arrays* *DIYBIO* *DIY weather and radiological surveying with high altitude balloons* *Small Scale Manufacturing (3D Printing, CNC Milling, Laser/Plasma Cutting, Etc.)* *Open Source/Low Cost Lab Equipment*

Cybernetics
Artificial olfaction *Sensor design* *Agent memory and orchestration* *Control Theory* *Enactivism* *Machine learning* *Biosystems, biosensing*

Biology/Mycology
Maskless microelectrode array fabrication for low cost cultured neuron signal acquisiton headstages *Mushroom Cultivation* *DIY TDCS/TEMS based on Howland Current pump* *Spore and Phage Culturing on Agar* *Fungal network mapping with diy EEG hardware* *Mushroom Identification* *Biosensor fabricationw with laser induced graphene*

References

Mark Hansen, Cofounder at Mithras
- *mark@mithras.industries*

Zephaniah Smith, Founder at The Cleo Bailey Experiment
- *1-(704)-439-6308*

Julian Wilson, Market Research Engineer II at Kyocera-AVX
- *1-678-923-3100*