MICROPYTHON: THE FAST TRACK TO AN IOT HELLSCAPE

Keith Harris

WHAT WE'LL DO:

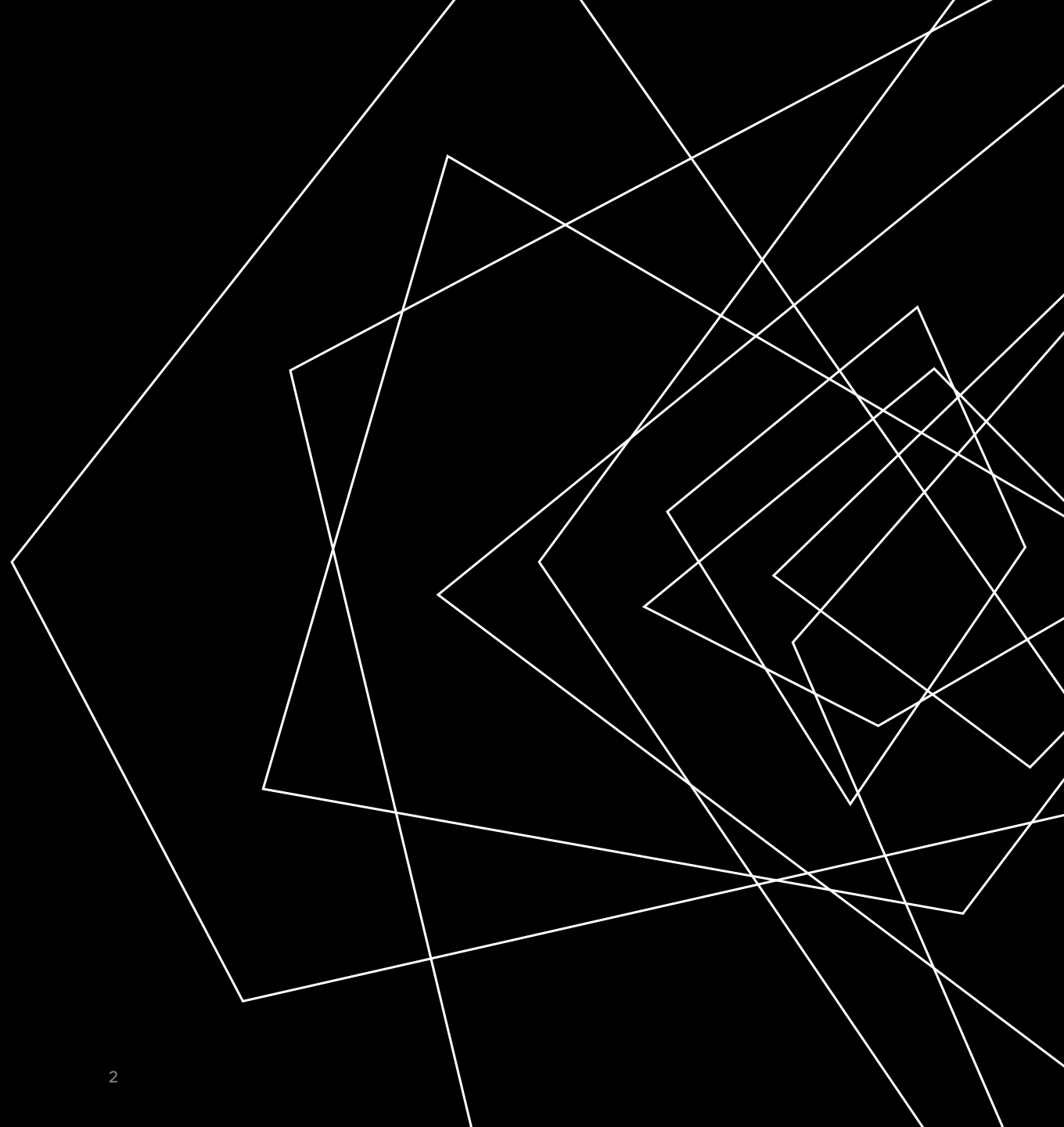
Introduction

A Closer Look at MicroPython

The Quick Start Guide

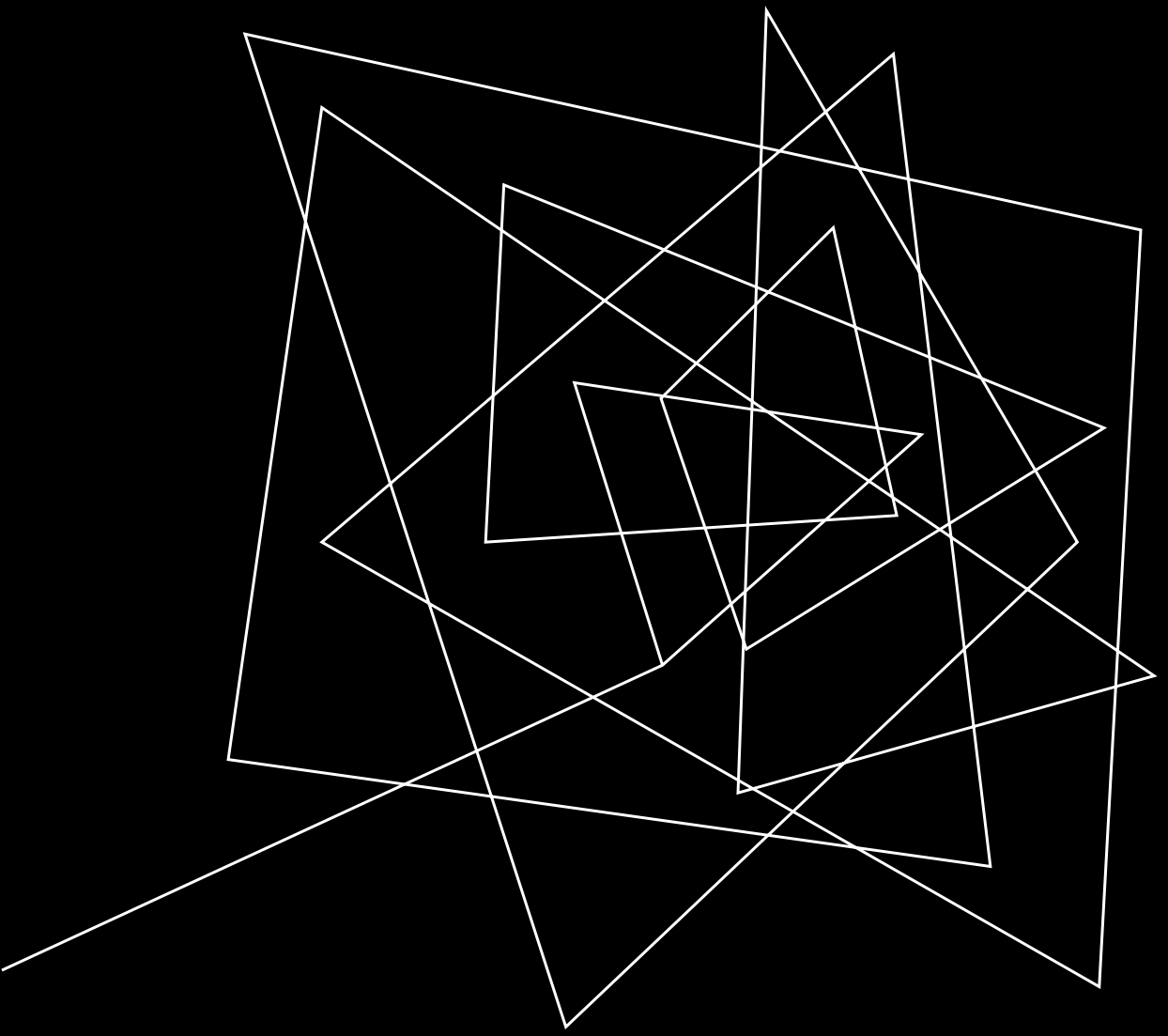
Custom Hardware + Demo

OTS Hardware + Demo



INTRODUCTION

Hello!



MICROPYTHON:

A Closer Look

WHO MADE IT?

Dr. Damien P. George

WHAT IS IT?

“MicroPython is a lean and efficient implementation of the Python 3 programming language that includes a small subset of the Python standard library and is optimised to run on microcontrollers and in constrained environments.”

Practically: Everything the Python interpreter needs is built out in C. The C code is used to “glue” the interpreter to the bare metal.

WHAT YOU GET

-An almost full version of python 3.xx! (asyncio, multi-thread)
-A serial based REPL
-.Py Portable across boards

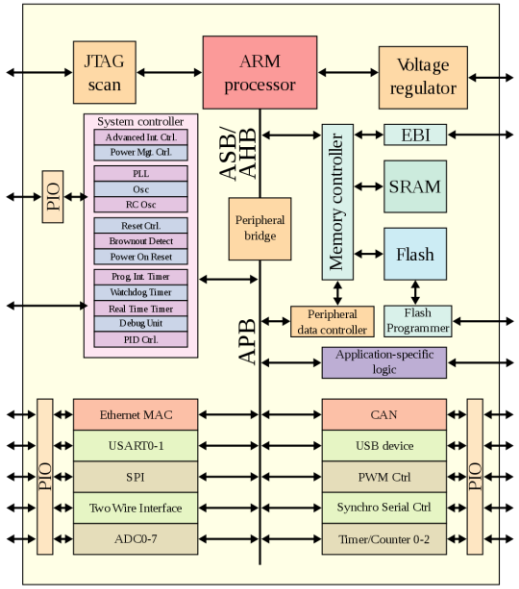
WHAT YOU DON'T GET

-Any C based python libraries (cython, ironPy, tinkr, numpy)
-Raw f-strings
-Super() implementation slightly different

HARDWARE CONSTRAINTS

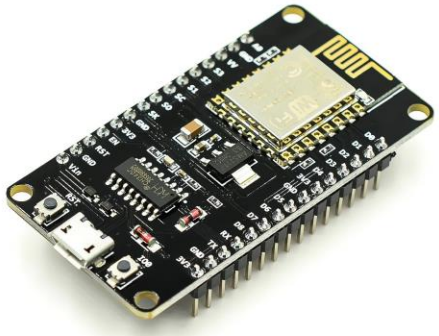
-Any SOC will work provided there is 2mb of memory available*

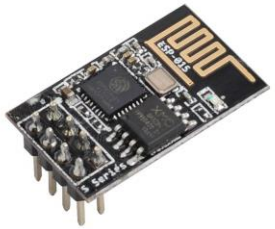
-Any operation requiring low latency will be difficult (work arounds abound)



OTS HARDWARE

-Pico Pi, esp8266, st32, and more!

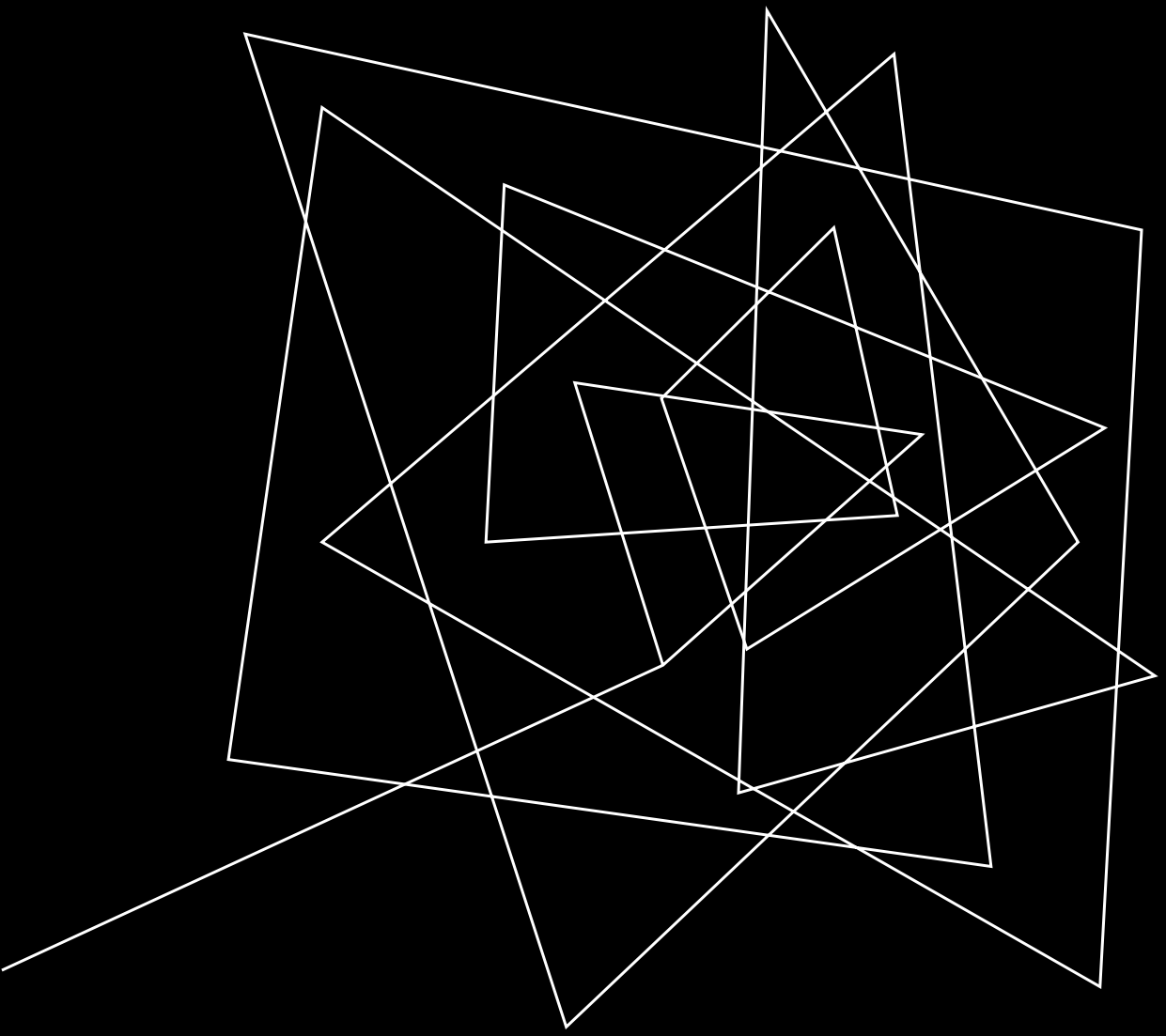




APPLICATION

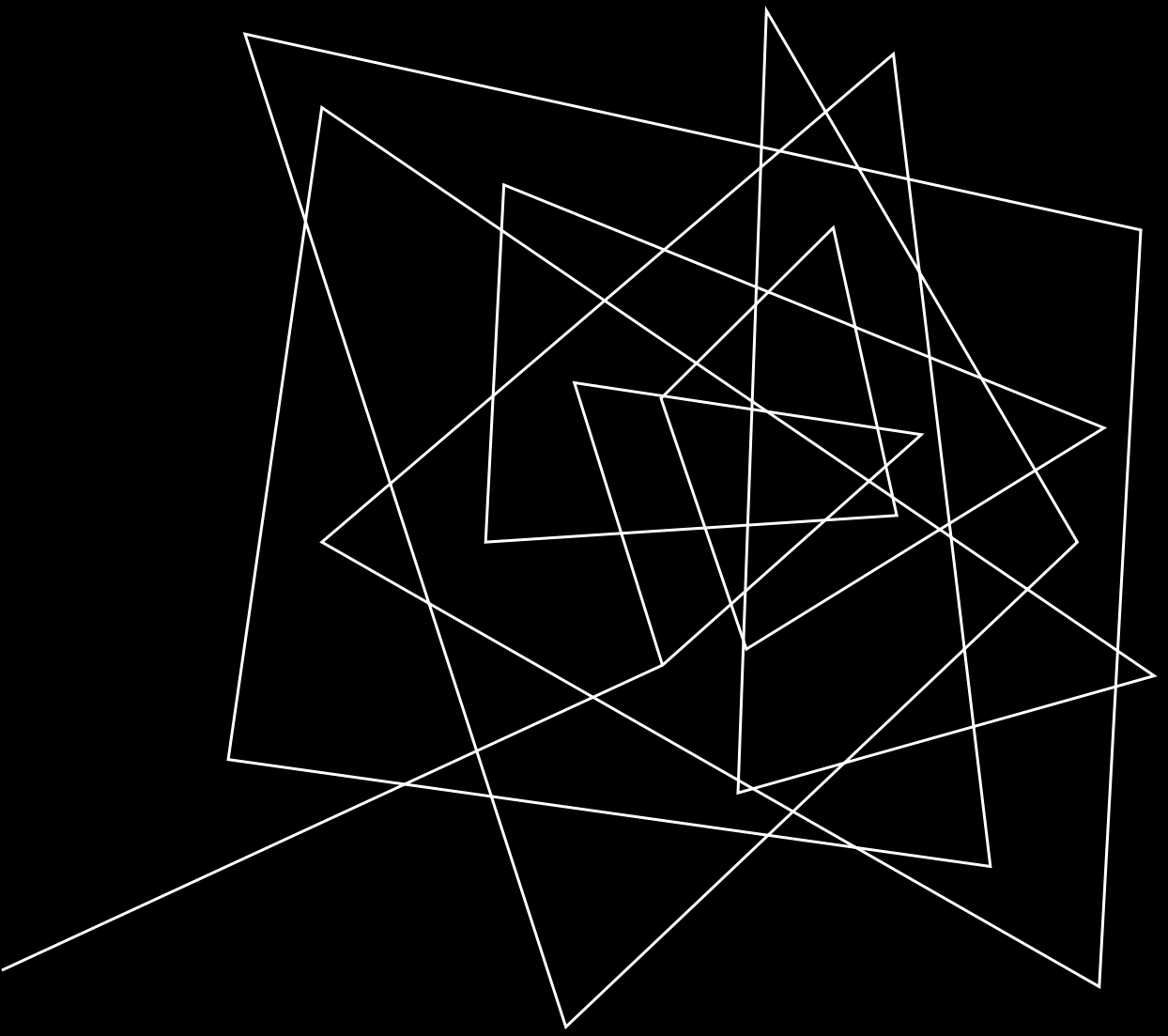
-Fast prototyping!
-One-off applications (visual effects, proof-of –concept)

APPLICATIONS IRL



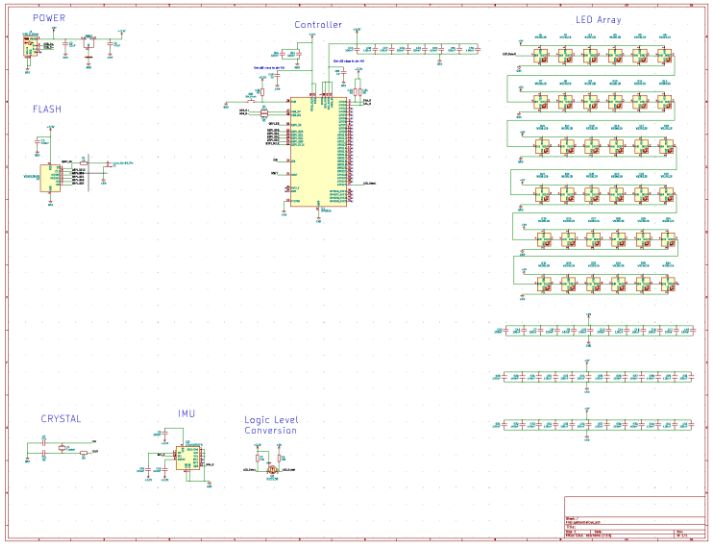
MICROPYTHON:

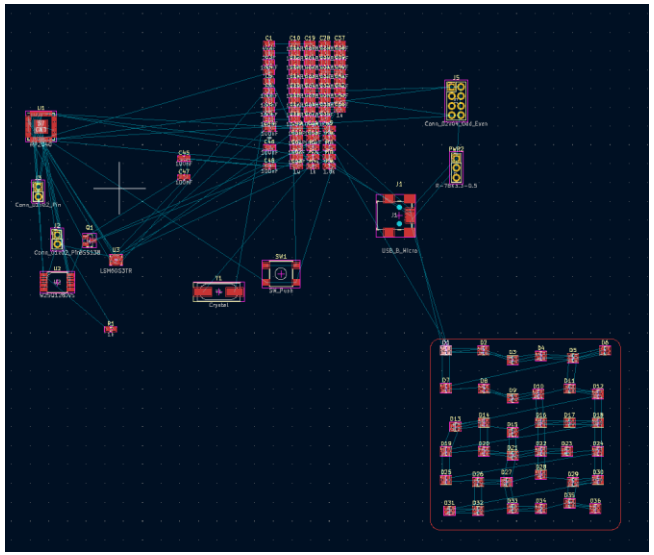
Quick Start Demo



CUSTOM HARDWARE

KICAD


POWER
Controller
LED Array
FLASH
CRYSTAL
IMU
Logic Level
Conversion

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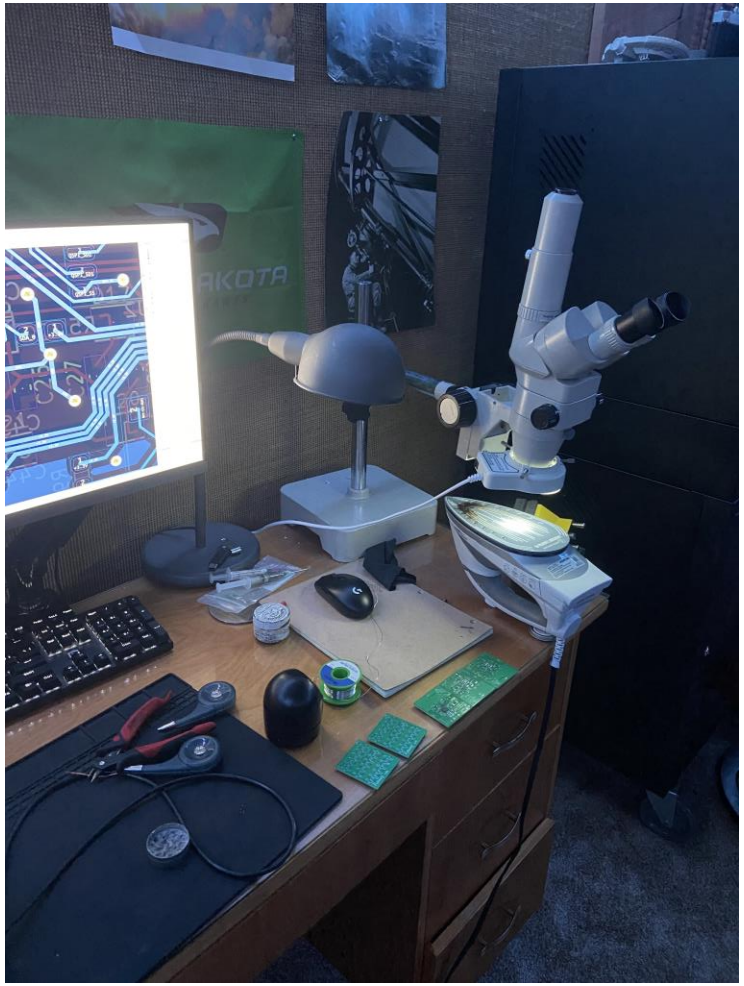
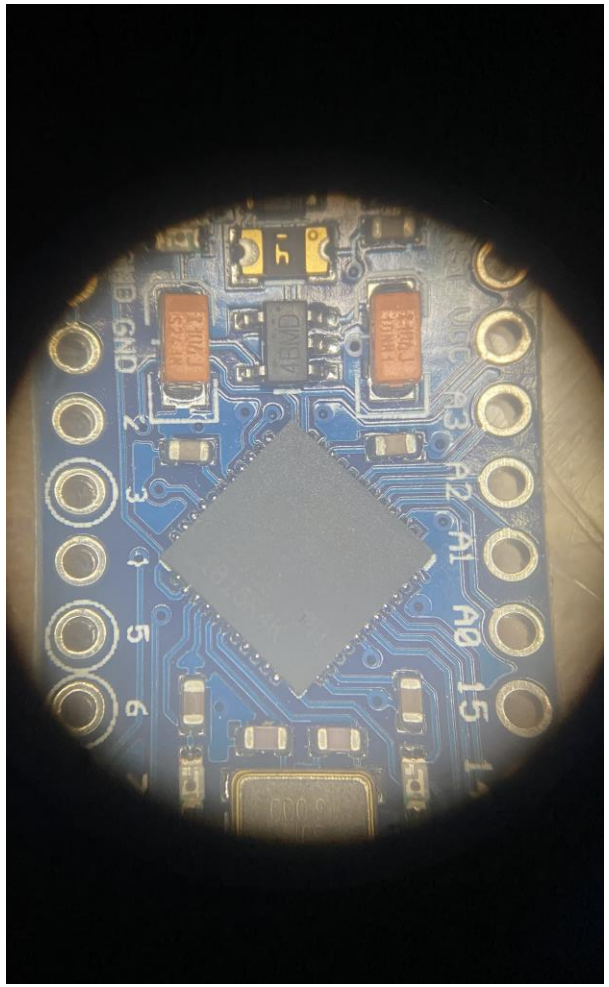
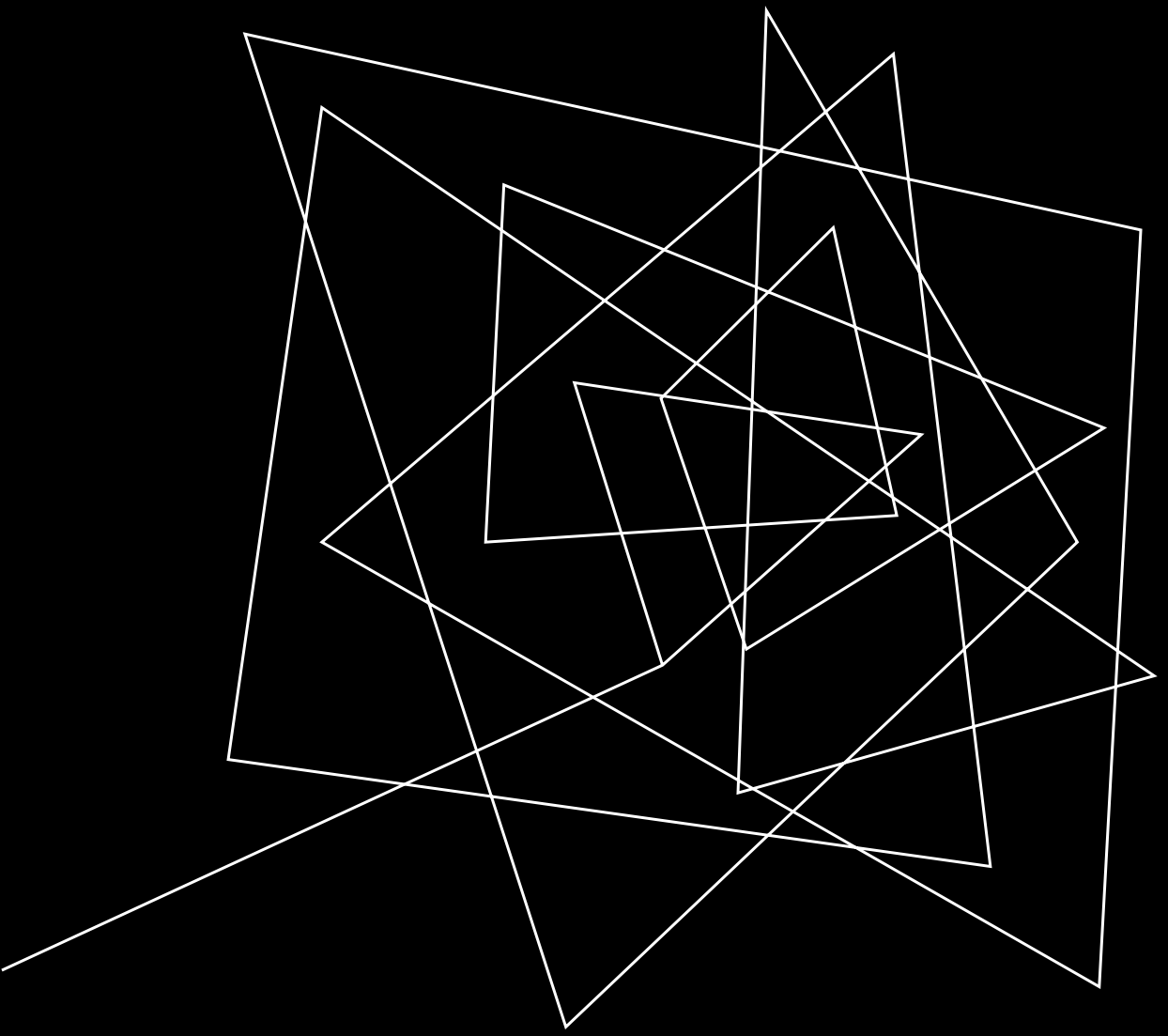
PyBoard

HARDWARE ASSEMBLY







MICROPYTHON:

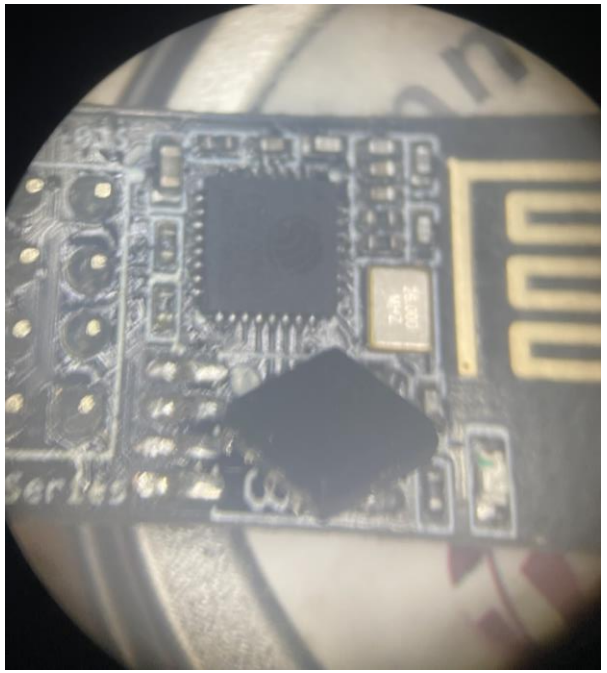
OTS Hardware Demo

OTHER COOL STUFF

-Esp-01 hack

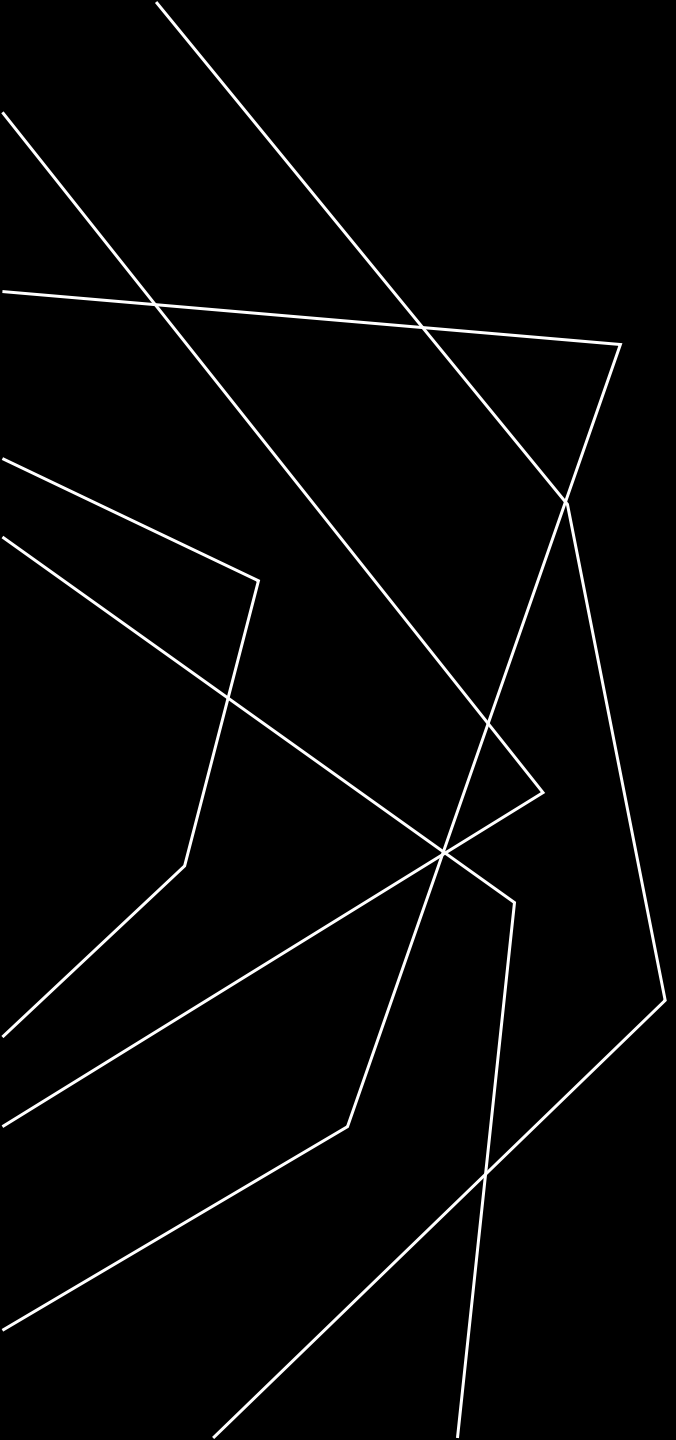
-TinyML

-Pyscript + MicroPython



SUMMARY

While MicroPython may not be the perfect embedded solution. It allows for rapid prototyping and brings a fresh take to a very stiff code-space. Makers rejoice!



THANK YOU

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LINKS

https://dpgeorge.net/

https://dev.to/tkeyo/tinyml-machine-learning-on-esp32-with-micropython-38a6

https://talkpython.fm/episodes/show/325/micropython-circuitpython

https://talkpython.fm/episodes/show/391/pyscript-powered-by-micropython

https://www.pythonpodcast.com/episode-15-damien-george-talks-to-us-about-micropython/

https://datasheets.raspberrypi.com/rp2040/hardware-design-with-rp2040.pdf

https://www.kicad.org/

Hardware Design: https://www.youtube.com/watch?v=kcwvuwetgEQ

https://projects.raspberrypi.org/en/projects/getting-started-with-the-pico/0

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https://www.brilliantmonocle.com/

Async: https://www.youtube.com/watch?v=5VLvmA__2v0

Multithread: https://www.youtube.com/watch?v=1q0EaTkztIs

https://makecode.com/blog/one-chip-to-flash-them-all