ELEC3300 LSP

Group 26 - Ching Hang MAK, Wai Paulo Valerio WANG

What Is It

- Laser Scanning Projector
  - Not to be confused with Laser Projectors
- Components Involved
  - STM32F3 Mainboard
  - DC-DC Converter
  - AC-DC PSU
  - Laser ~~Gun~~ Pointer
  - Stepper Motors & Drivers
  - Mirrors

How It Works

1. MCU turns on laser pointer
2. MCU sends PWM signal to stepper motors
3. Stepper motor moves while pointer is on
4. MCU turns off laser pointer

Persistence of Vision

Software Rendering Techniques

- Bitmap
- Tuple (USB)
- Microphone
- 3.5mm Jack

Challenges Faced

- Stepper Motor Response Rate
  - Image Deformation
- PCB Design Errors
- Understanding ARMv7 ISA
- Optimizations
- Difficult Collaboration
- Bugs, Bugs, BUGS

- Chinese Customs (enough said)

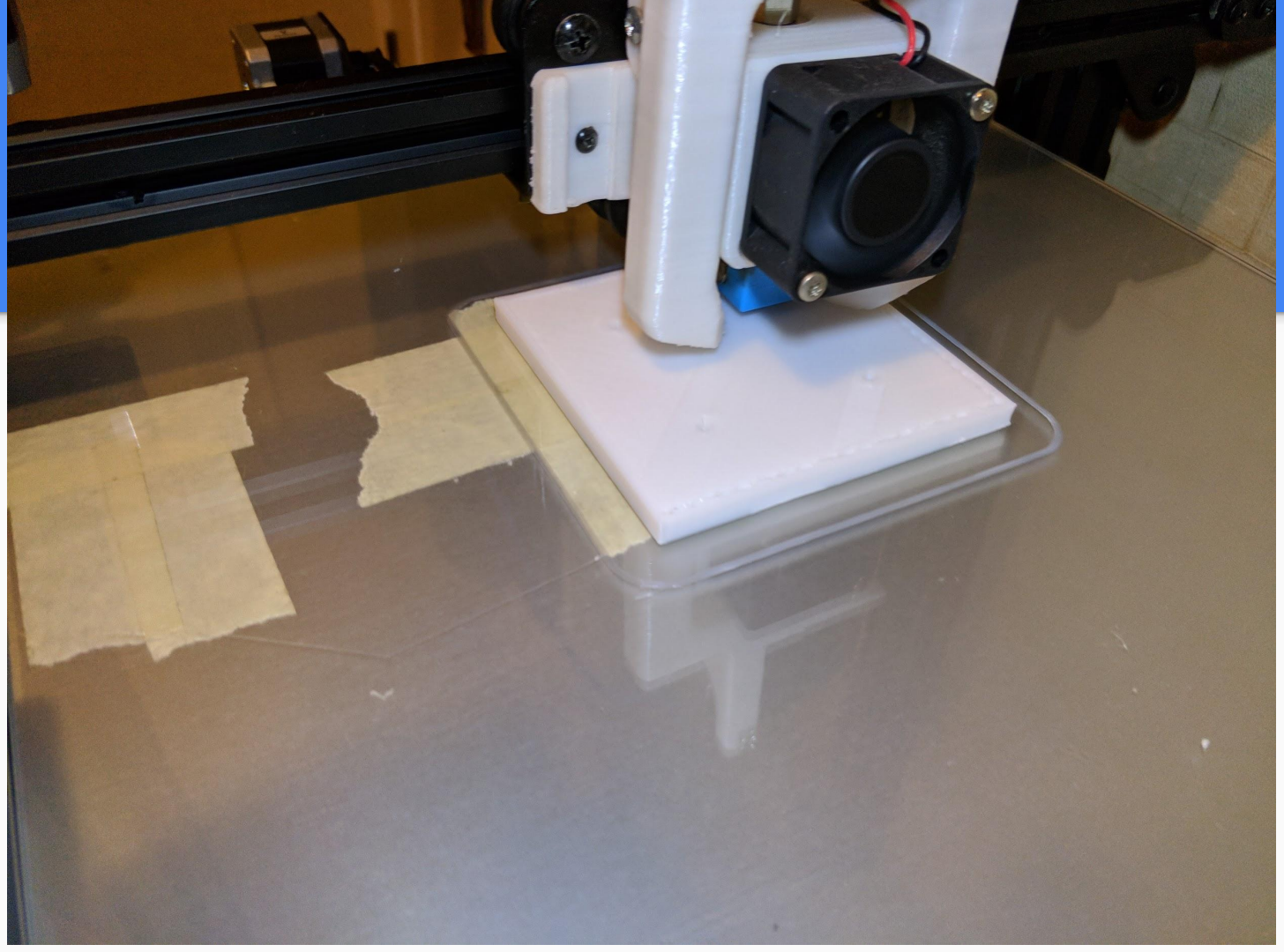
Potential Improvements

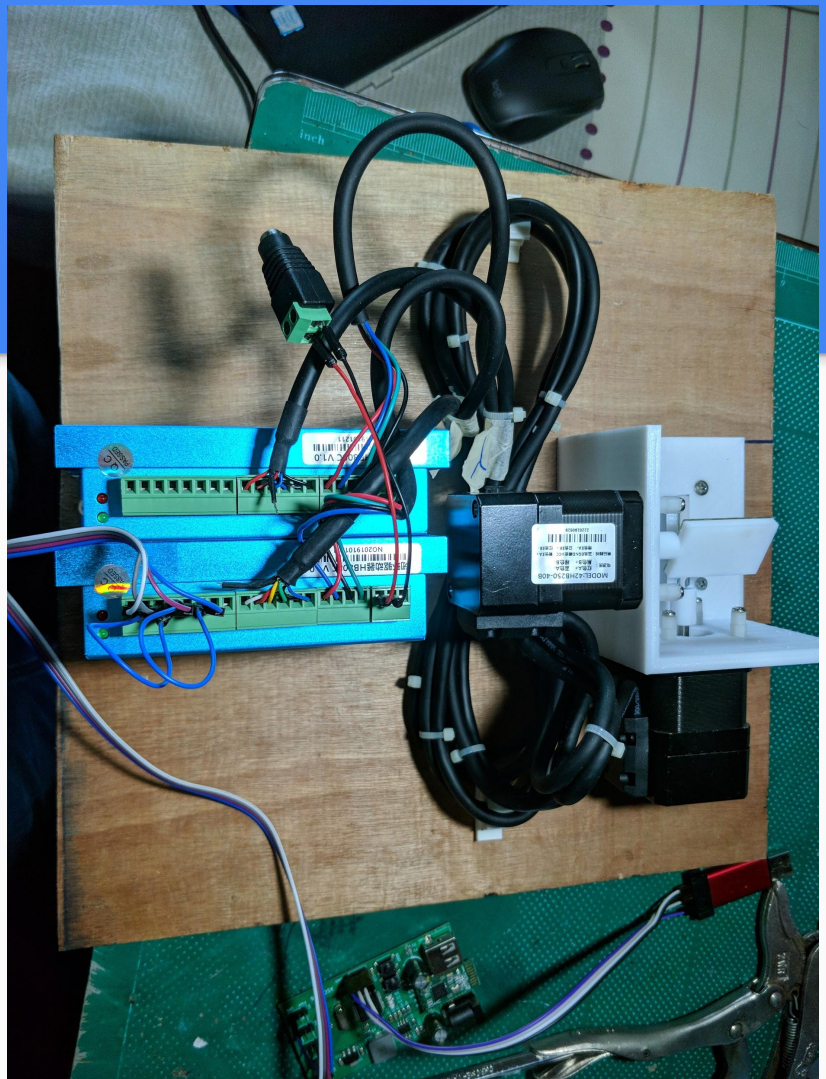
- Other data sources (e.g. SD Card, Video)
- Faster Response using Polygon Mirror
  - or self-designed stepper drivers ¯_(ツ)_/¯
- SPI DMA

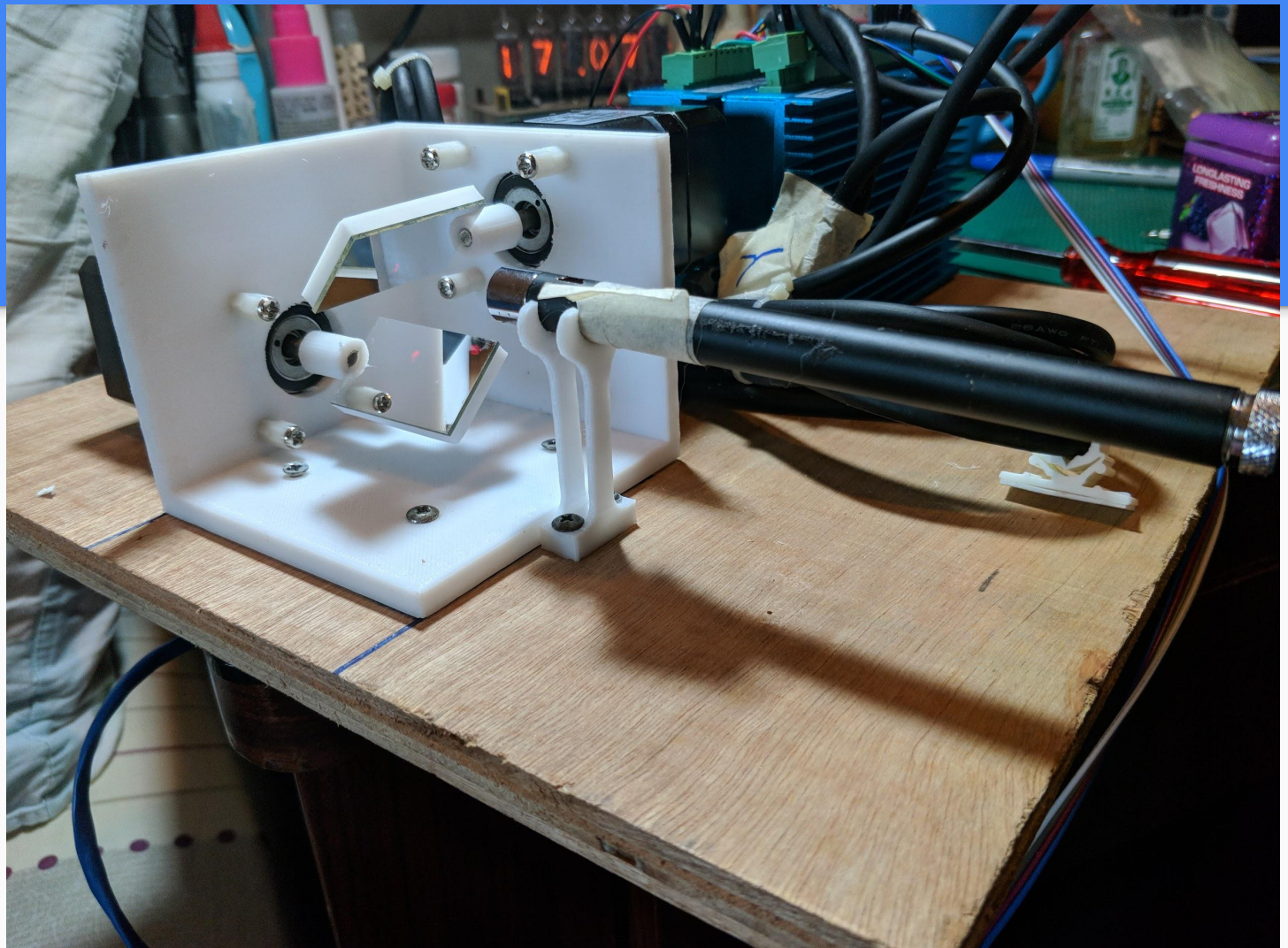
Progress Timeline

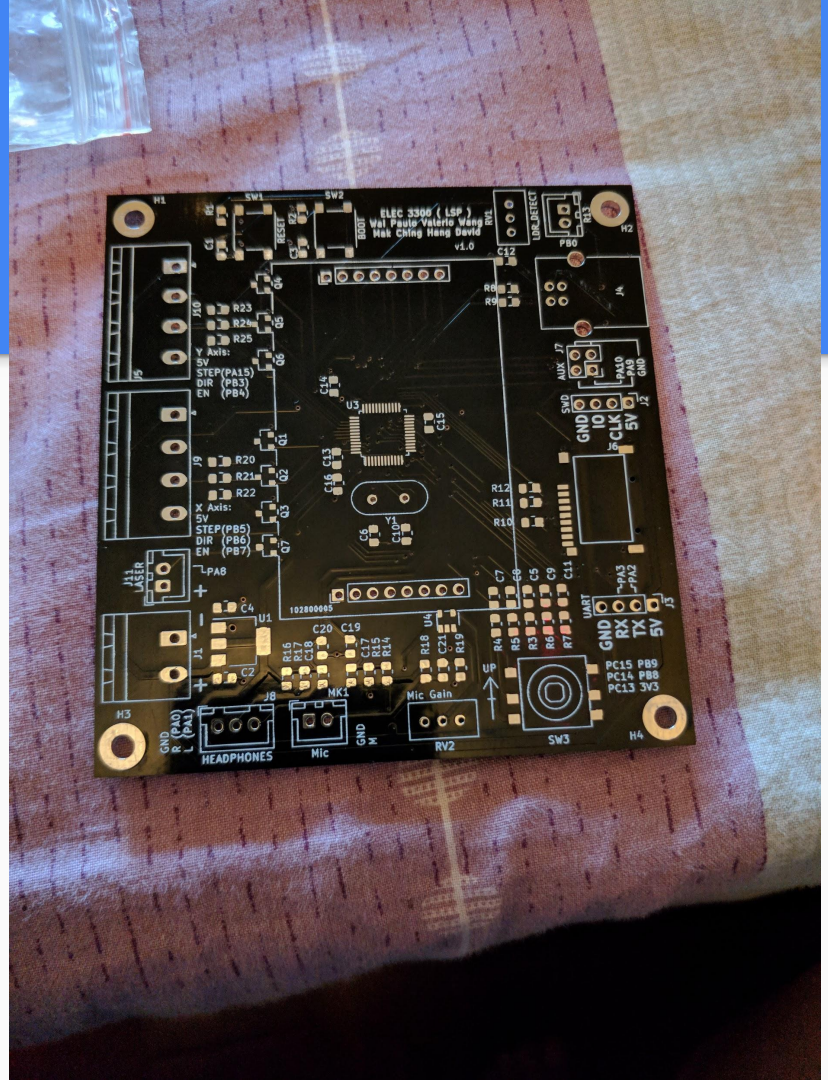
- Initial Schematic: 27/10
- Peripheral Drivers Completion: 23/11
- Mic Render: 27/11
- Bitmap and Tuple Render: 30/11
- Rest of the Features: Yesterday

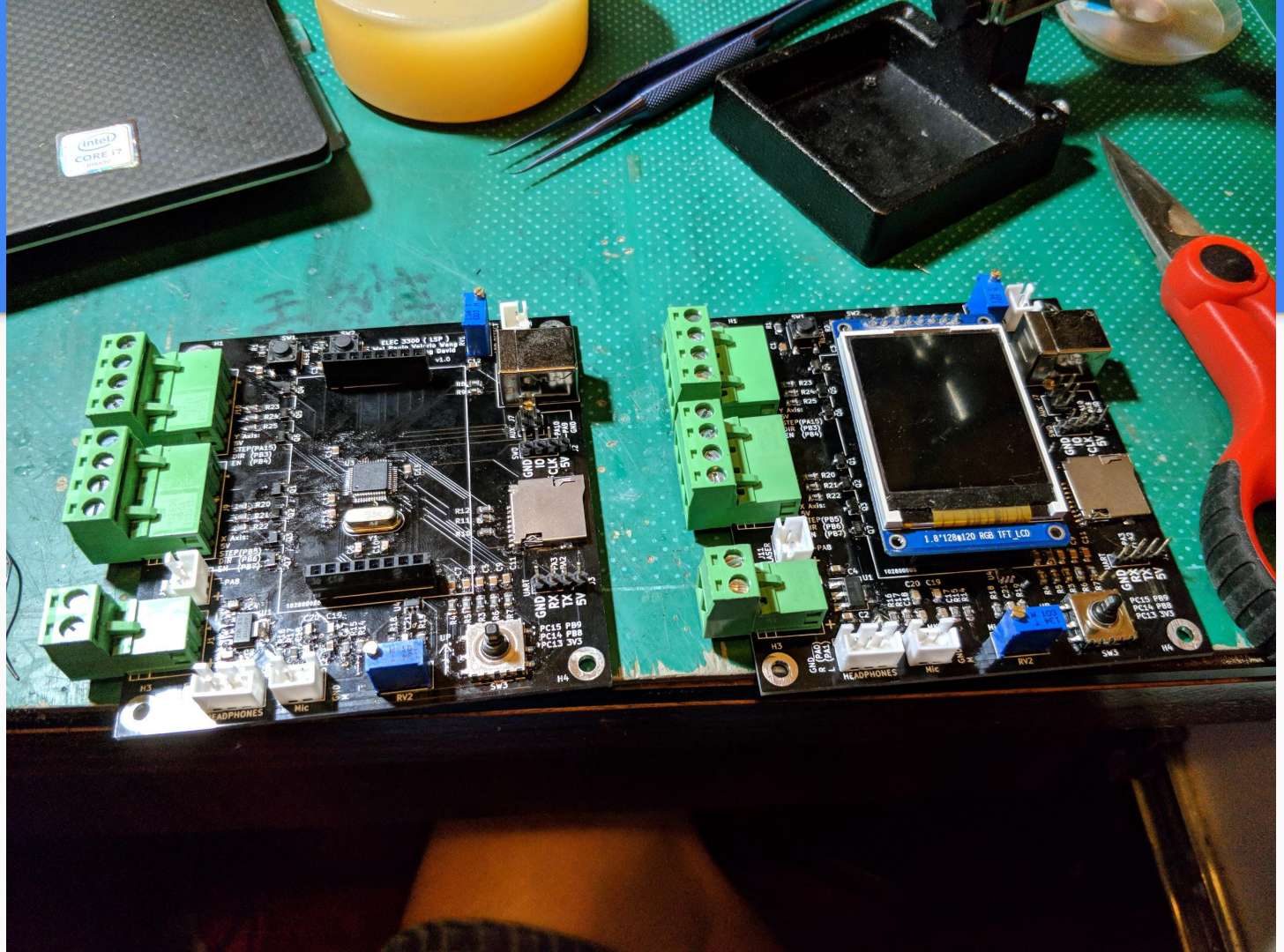
https://streamable.com/pnxzu

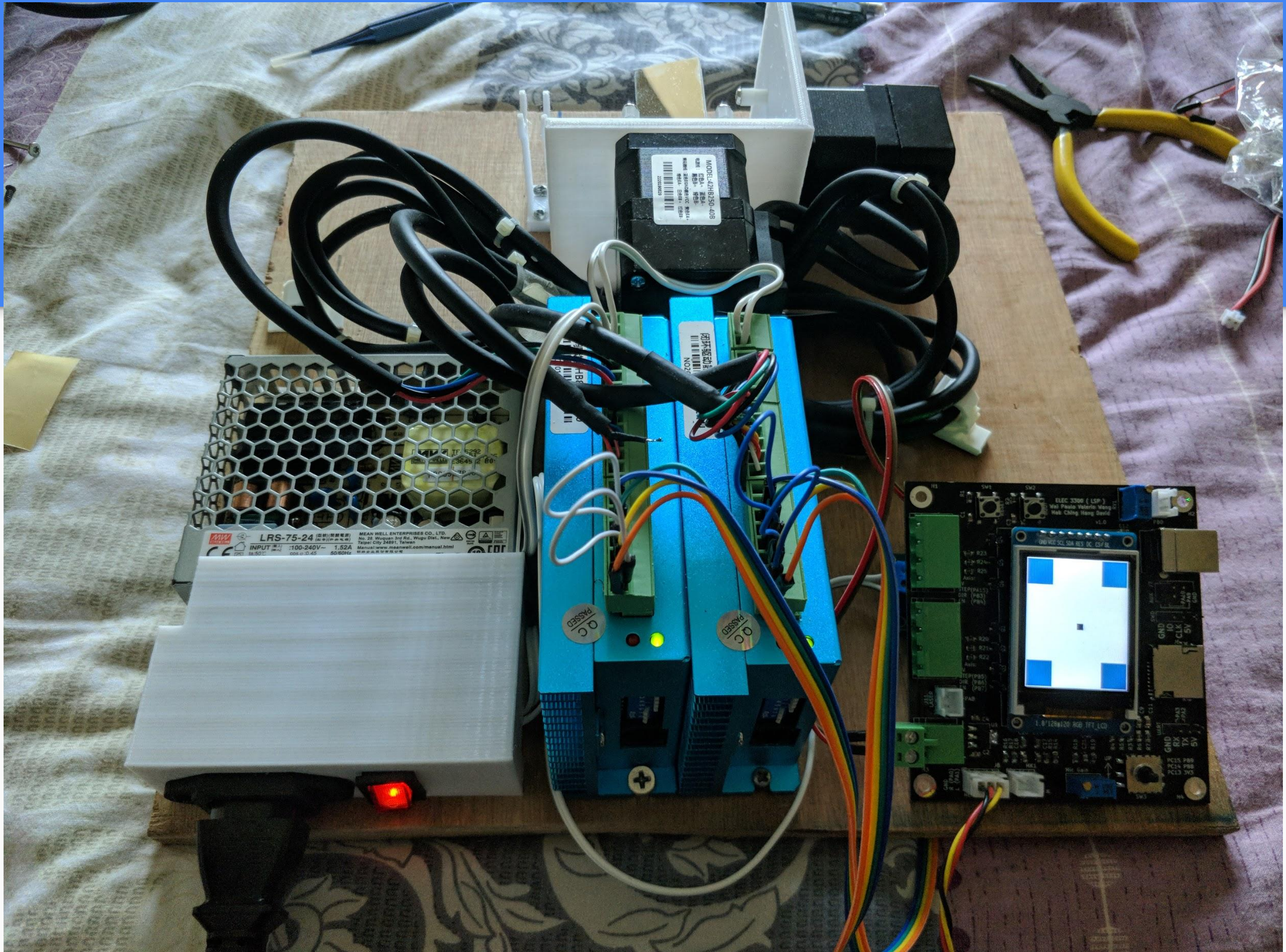





17.07
LONGLASTING
FRESHNESS


ELEC 3300 (L6B)
Wai Paulo Valerio Wong 3
Hak Ching Heng David
v1.0
Y Axis:
5V
STEP(PA15)
DIR (PB3)
EN (PB4)
X Axis:
5V
STEP(PB5)
DIR (PB6)
EN (PB7)
HEADPHONES
Mic
Mic Gain
RV2
SW3
UP
PC15 PB9
PC14 PB8
PC13 3V3
GND
RX
TX
5V
SWD
IO
CLK
5V
AUX
PA10
PB8
GND
PA8
PA3
PA2
LDR_DIRECT
PB0


intel
CORE i7
1.8"128*120 RGB TFT_LCD
HEADPHONES
Mic
RV2
SW3


LRS-75-24
MEAN WELL ENTERPRISES CO., LTD.
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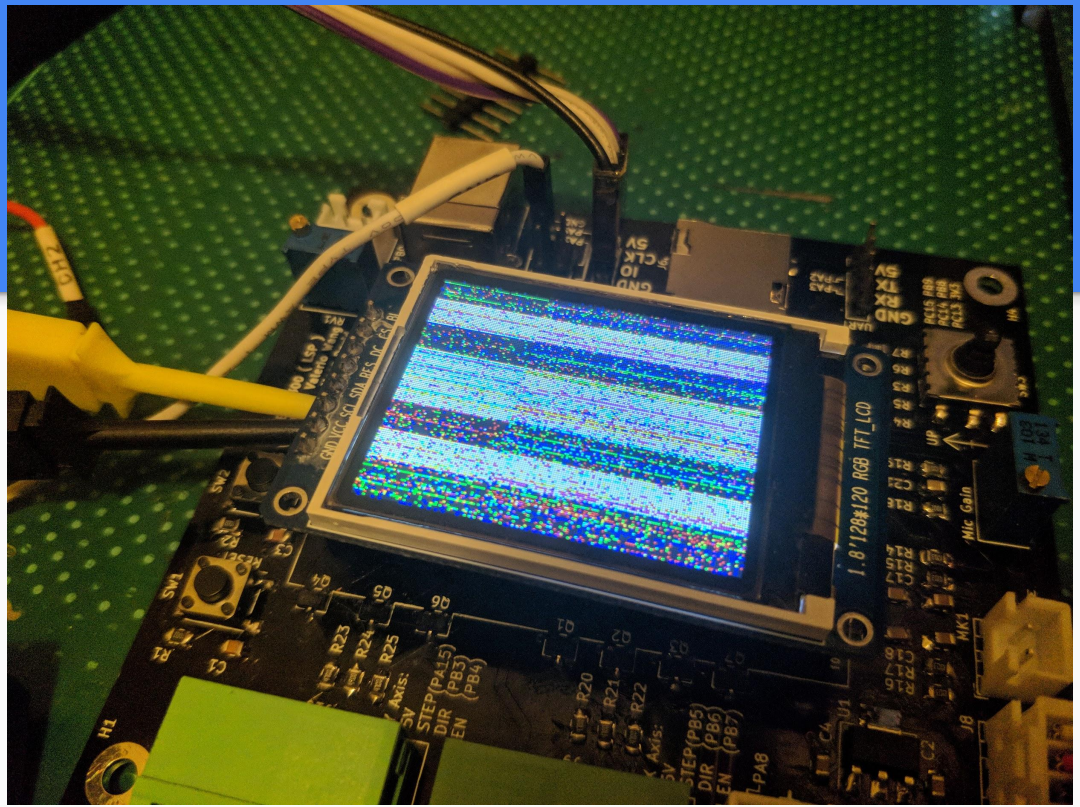
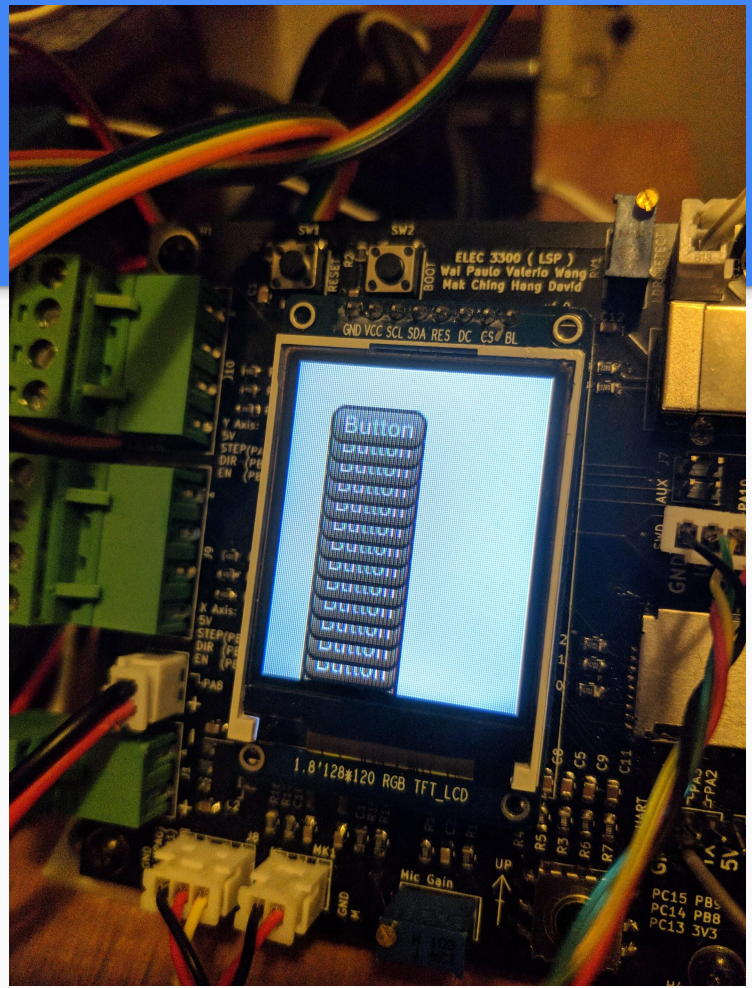
ELEC 3300 (LSP)




ELEC 3300 (LSP)
Wai Paulo Valerio Wong
Mak Ching Hang David
GND VCC SCL SDA RES DC CS BL
Button
1.8'128*120 RGB TFT_LCD
Mic Gain

Homing

https://streamable.com/ydbai