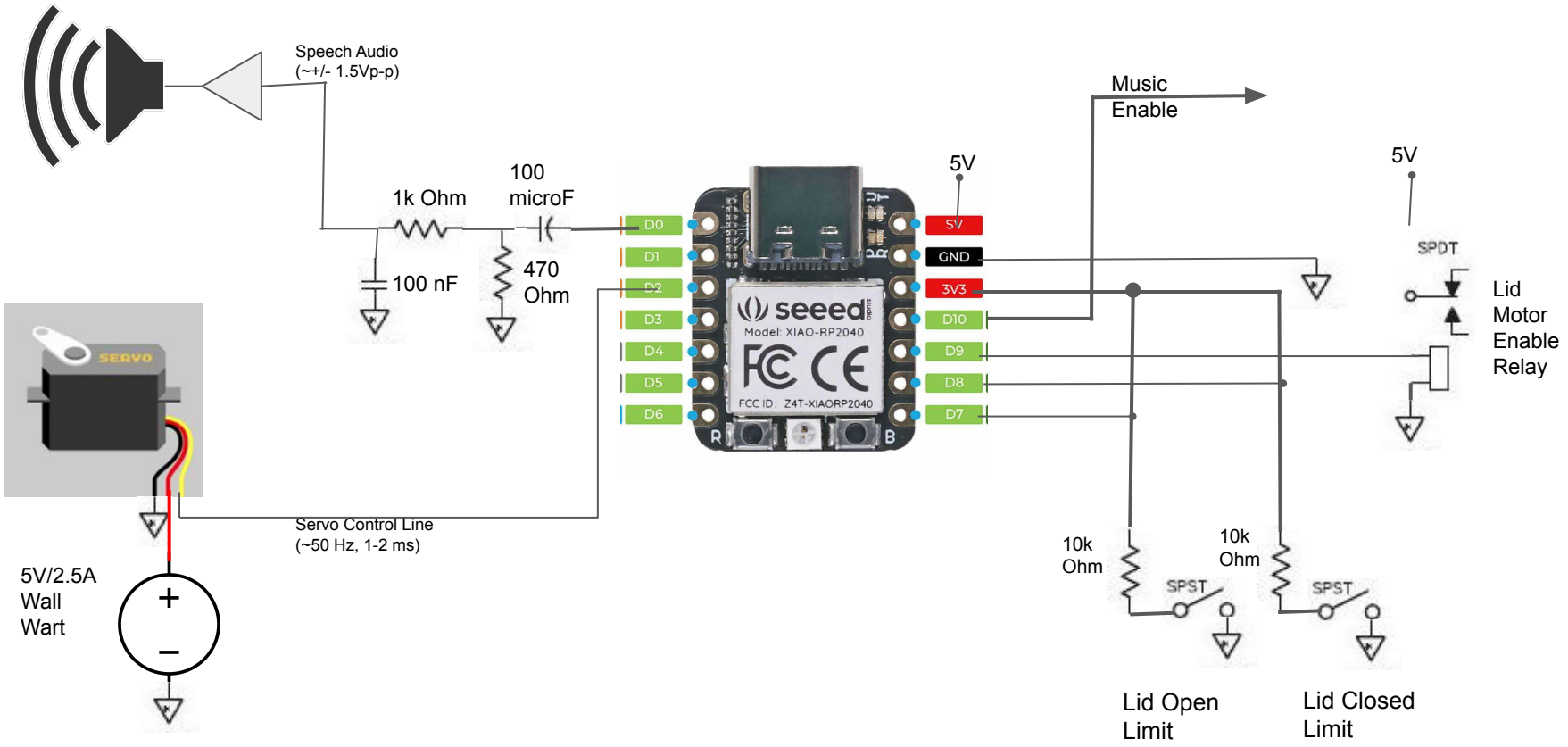
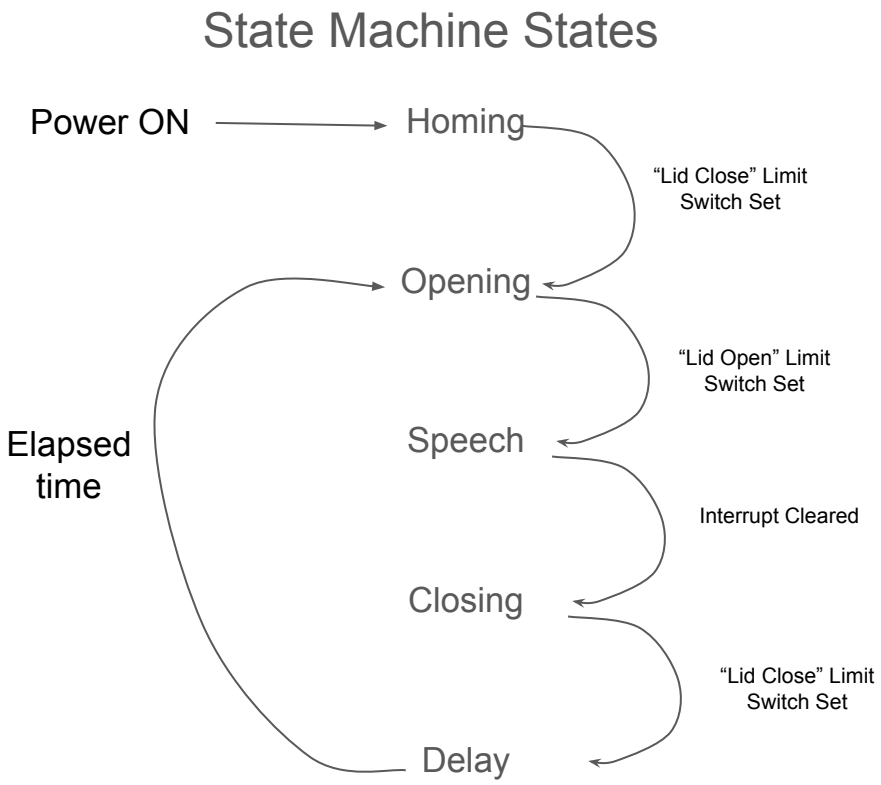
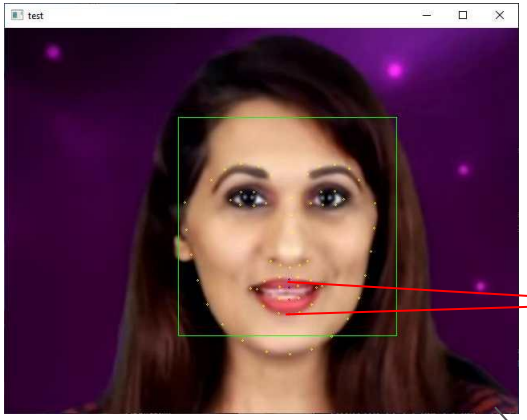
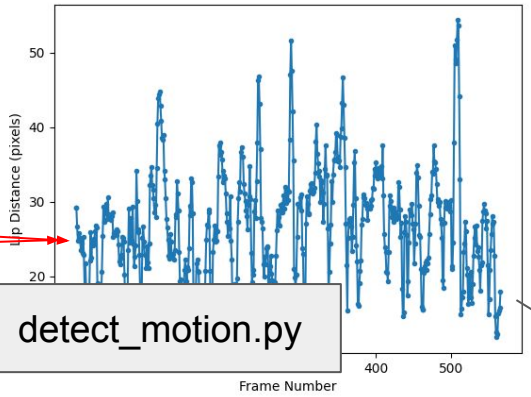

Speech Audio
(~+/- 1.5Vp-p)
1k Ohm
100
microF
100 nF
470
Ohm
5V
Music
Enable
5V
SPDT
Lid
Motor
Enable
Relay
D0
D1
D2
D3
D4
D5
D6
5V
GND
3V3
D10
D9
D8
D7
seeed
Model: XIAO-RP2040
FCC ID: Z4T-XIAORP2040
SERVO
Servo Control Line
(~50 Hz, 1-2 ms)
5V/2.5A
Wall
Wart
+
–
10k
Ohm
10k
Ohm
SPST
SPST
Lid Open
Limit
Lid Closed
Limit

Software Architecture

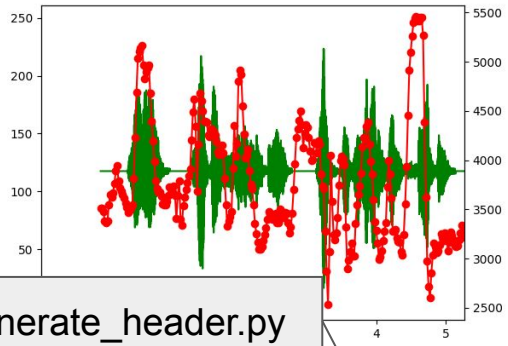


How the servo/speech audio is synchronized





detect_motion.py



generate_header.py

Time(s)

ffmpeg extract audio from video

.wav

.h

How the Pulse Width Modulation (PWM) Counters are set

“IRQ PWM” - generates an interrupt

“Motor PWM” - generates (~50 Hz update, ~1-2 ms width) servo control pulses

“Audio PWM” - generates PWM signal