

The background is a dark navy blue. It features several large, overlapping, semi-transparent geometric shapes in various colors: bright green, cyan, magenta, orange, and blue. These shapes are arranged in a way that creates a sense of depth and movement, with some appearing to recede and others to come forward.

# **CA3 PRESENTATION**

**PIANO ASSISTOR  
/LEARNER**

# CONTENT

INTRODUCTION

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HOW DOES IT  
WORK?

RPI3 VS  
ARDUINO UNO

IMPROVEMENTS

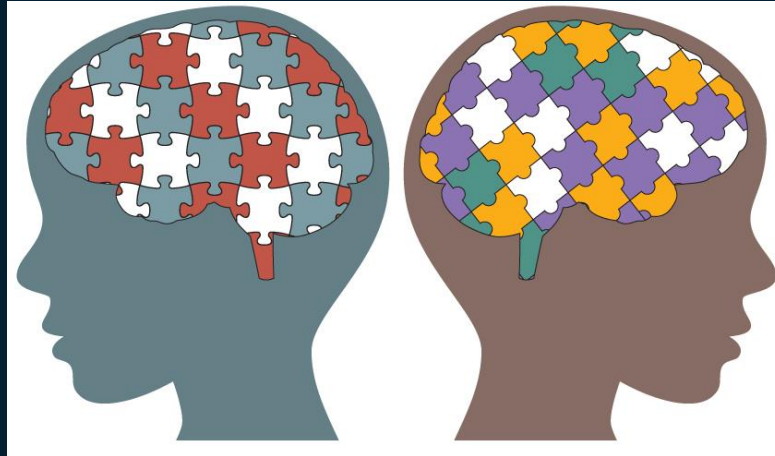
DEMO

CONCLUSION

# Introduction

## PROBLEM STATEMENT

How can we help people with autism in their everyday lives?





# BACKGROUND INFORMATION

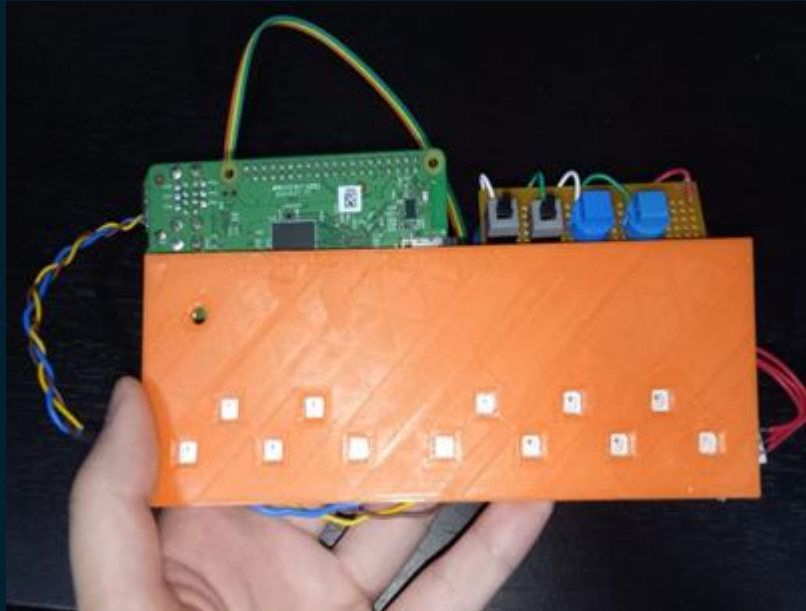
- How music help?
- Why Piano?



# DO YOU KNOW?

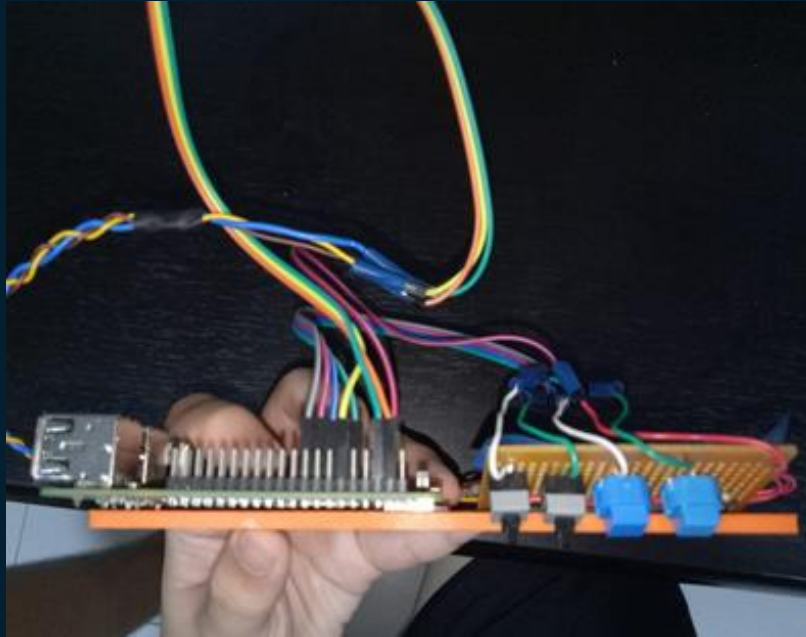
**One in 150 children has autism in Singapore, a higher rate than the World Health Organizations'(WHO) global figure of one in 160 children (youngparents, 2019).**

# Solution



- **Piano Assistor/Learner** is a device that can blink LEDs in the LED strip with the use of **MIDI signals**.
- To be mounted in the Piano in which a user can play the instrument according to the **blinking of the LEDs**.

# Solution



- The Tempo of a piece of music is the **speed** of the underlying beat, which is also called 'pulse' of music.
- Controlled with the **use of 2 buttons** each for Tempo Up and Tempo Down.

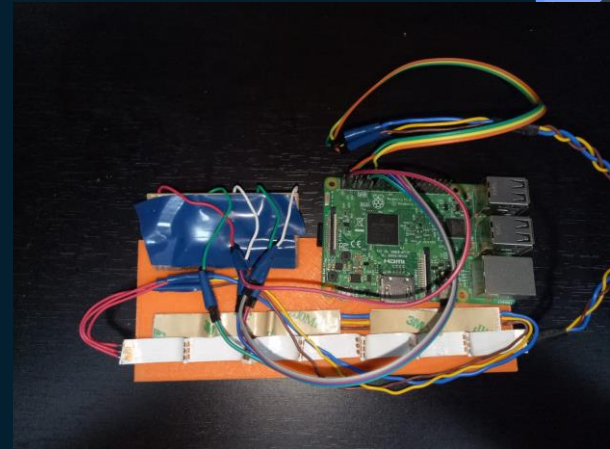


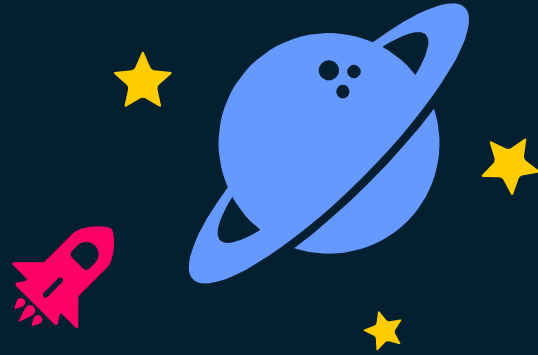
# Components



# Component List

- 4x momentary switch (Any type)
- 220 ohm resistor
- Raspberry Pi 3 model B
- Custom 3d printed bracket
- 8x female to female jumper wires
- WS2812B LED Strip
- Mounting tape





# HOW DOES IT WORK?

# Explanation

The Python Script works by

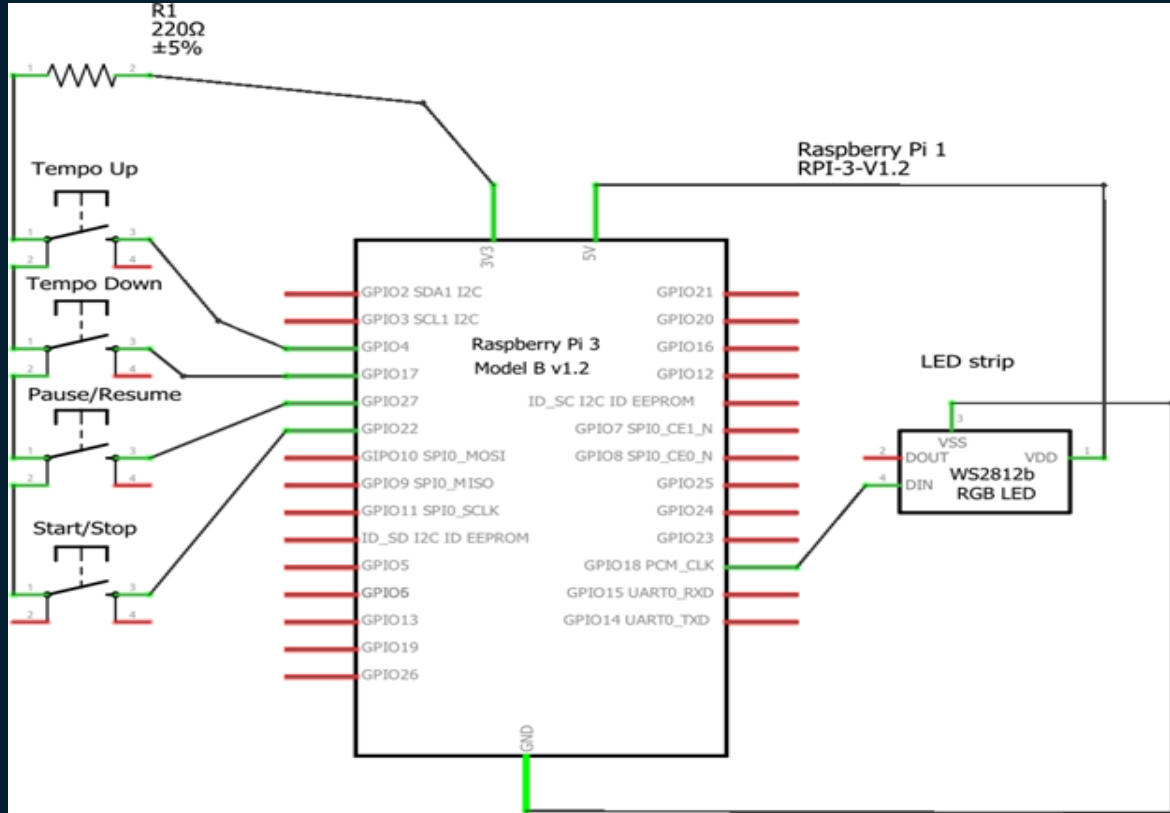
- Utilizing both the mido library which reads MIDI files,
- The RPi GPIO library to interact with the GPIO Pins,

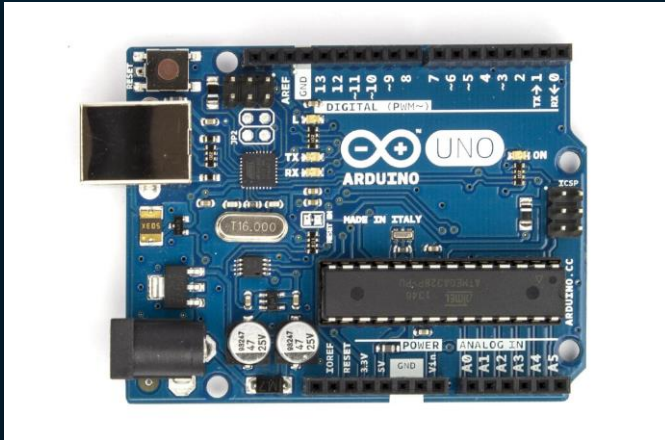
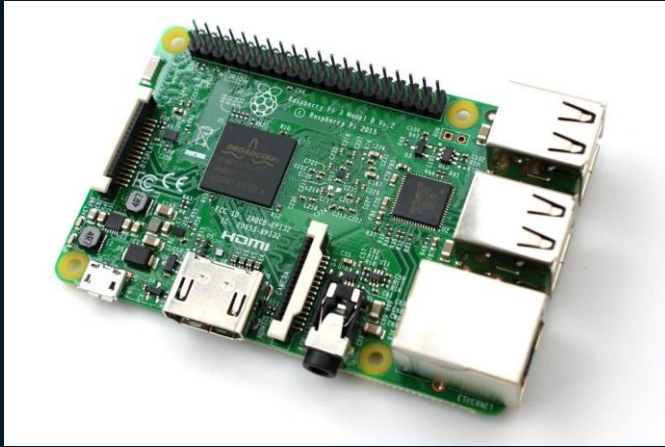
Using the Neopixel library to control the individual LEDS on the WS2812B LED Strip

The algorithm reads from the MIDI file and store the notes into a list that would update the LEDs every smallest beat.

All 4 buttons Start/Stop, Pause/Resume, Tempo Up, Tempo Down are all are implemented as event-based functions using the `add_event_detect` function as provided by the `Rpi.GPIO` library.

# Schematic





# Rpi 3 Model B vs Arduino Uno



**DEMO**



# **IMPROVEMENTS AND RECOMMENDATIONS**

The background is a solid dark navy blue. In the four corners, there are abstract, overlapping geometric shapes. On the left, there are shapes in shades of cyan, orange, and magenta. On the right, there are shapes in shades of cyan, magenta, and orange. These shapes appear to be layered, creating a sense of depth and modern design.

# CONCLUSION





**THANK  
YOU**

# Q&A