

EMBEDDED SOFTWARE FOR THE IOT

SPOTIFY DIRECT MANAGER

INTRODUCTION

MAIN IDEA & OBJECTIVE

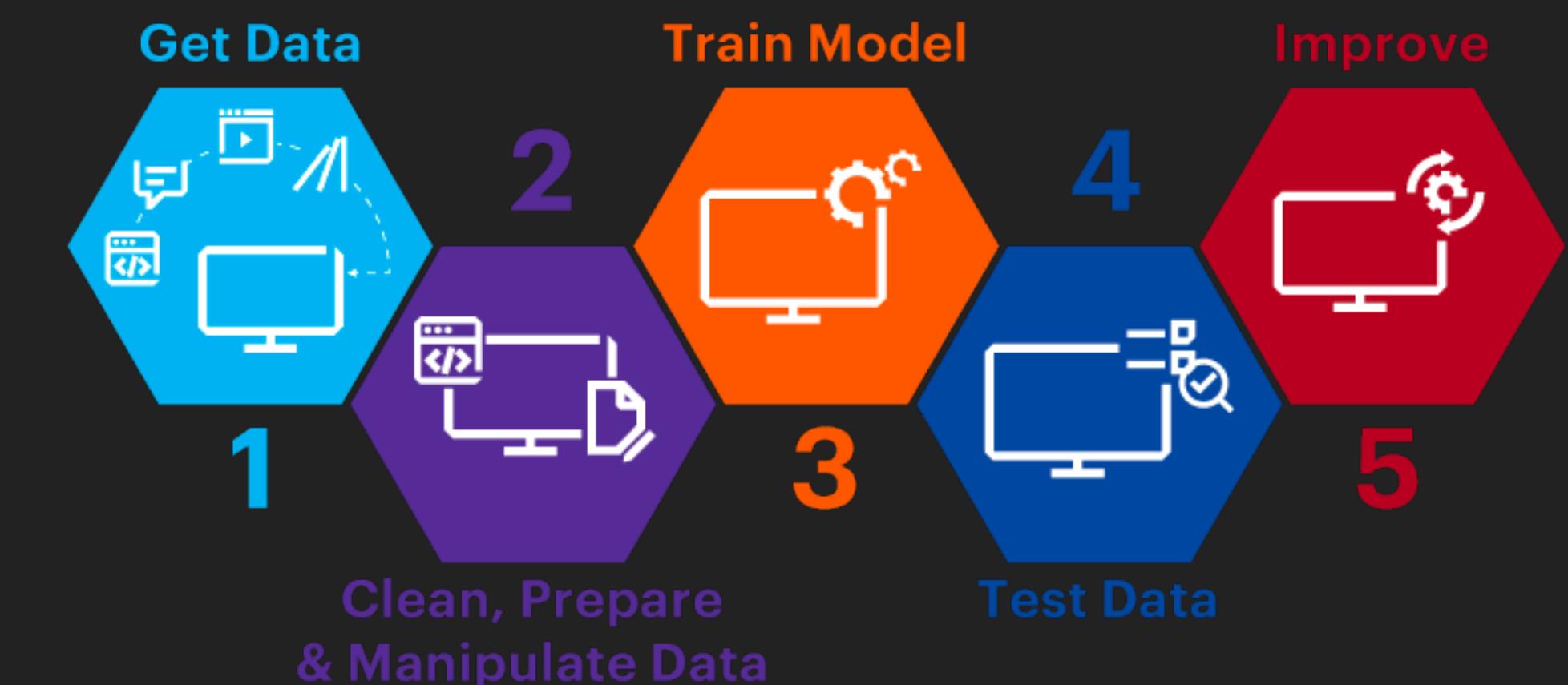
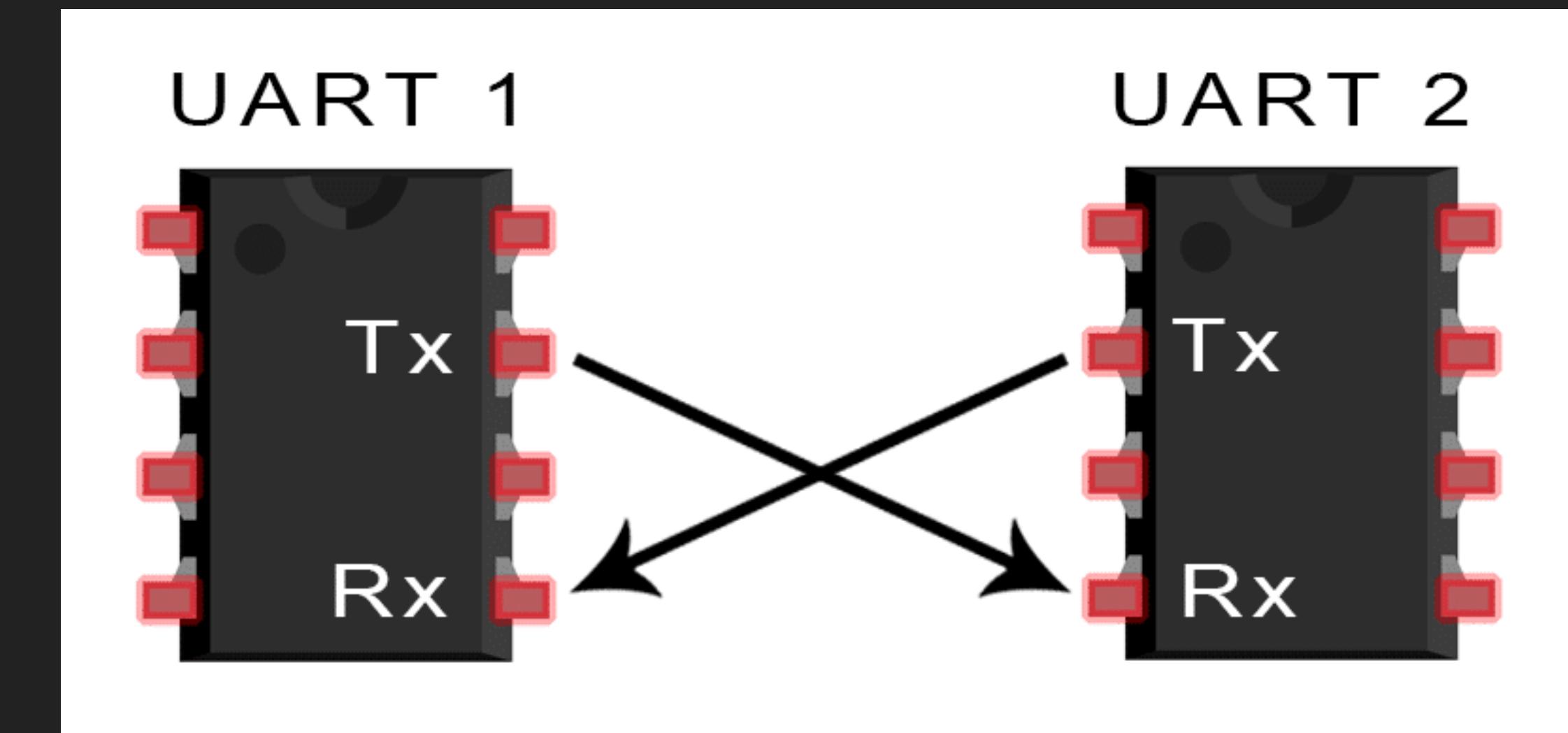
- ▶ Our main goal was to build a system that could manage our Spotify client remotely.
- ▶ Another key idea was to have some keyword spotting system to better manage our client



INTRODUCTION

CHALLENGES

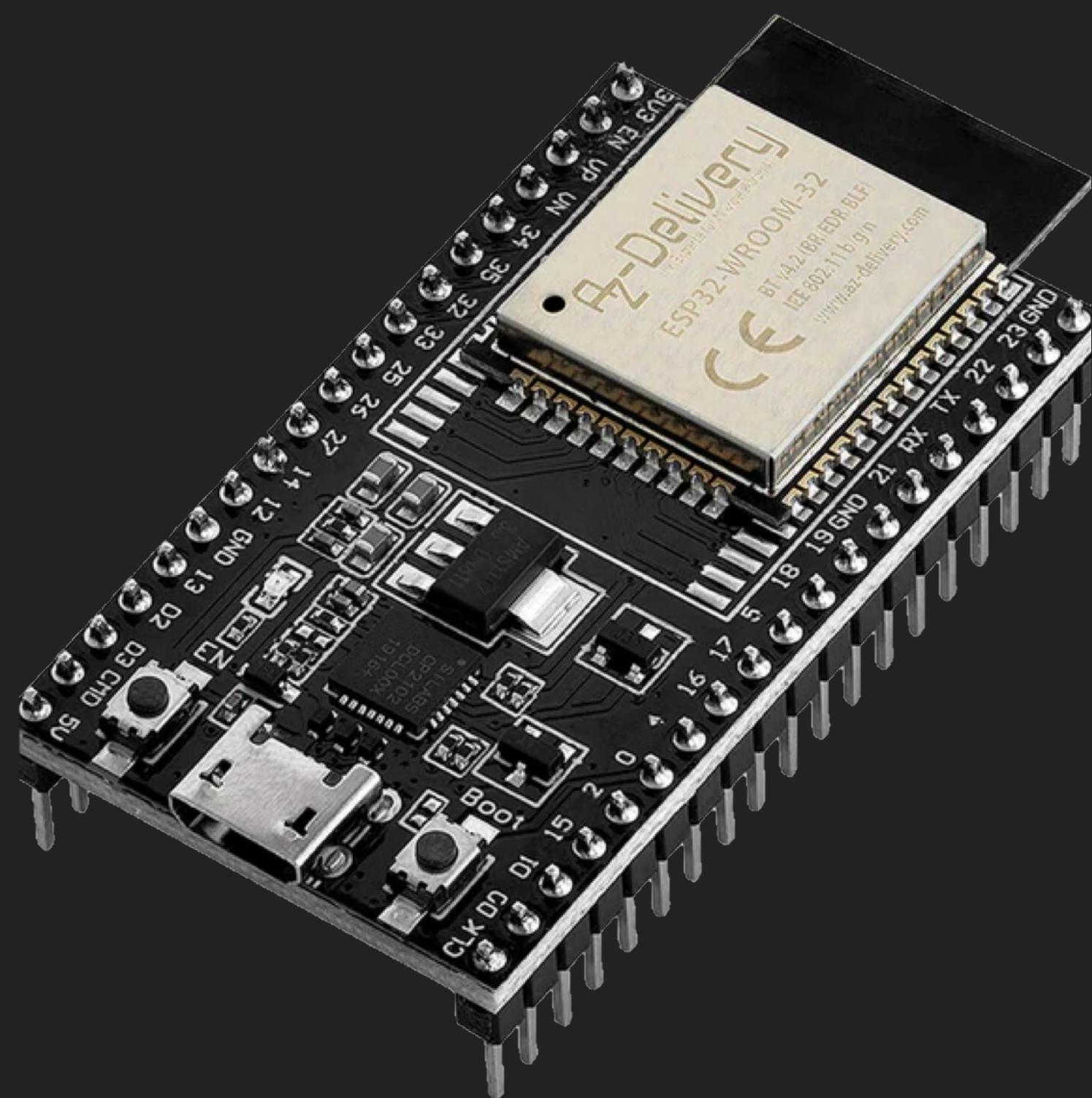
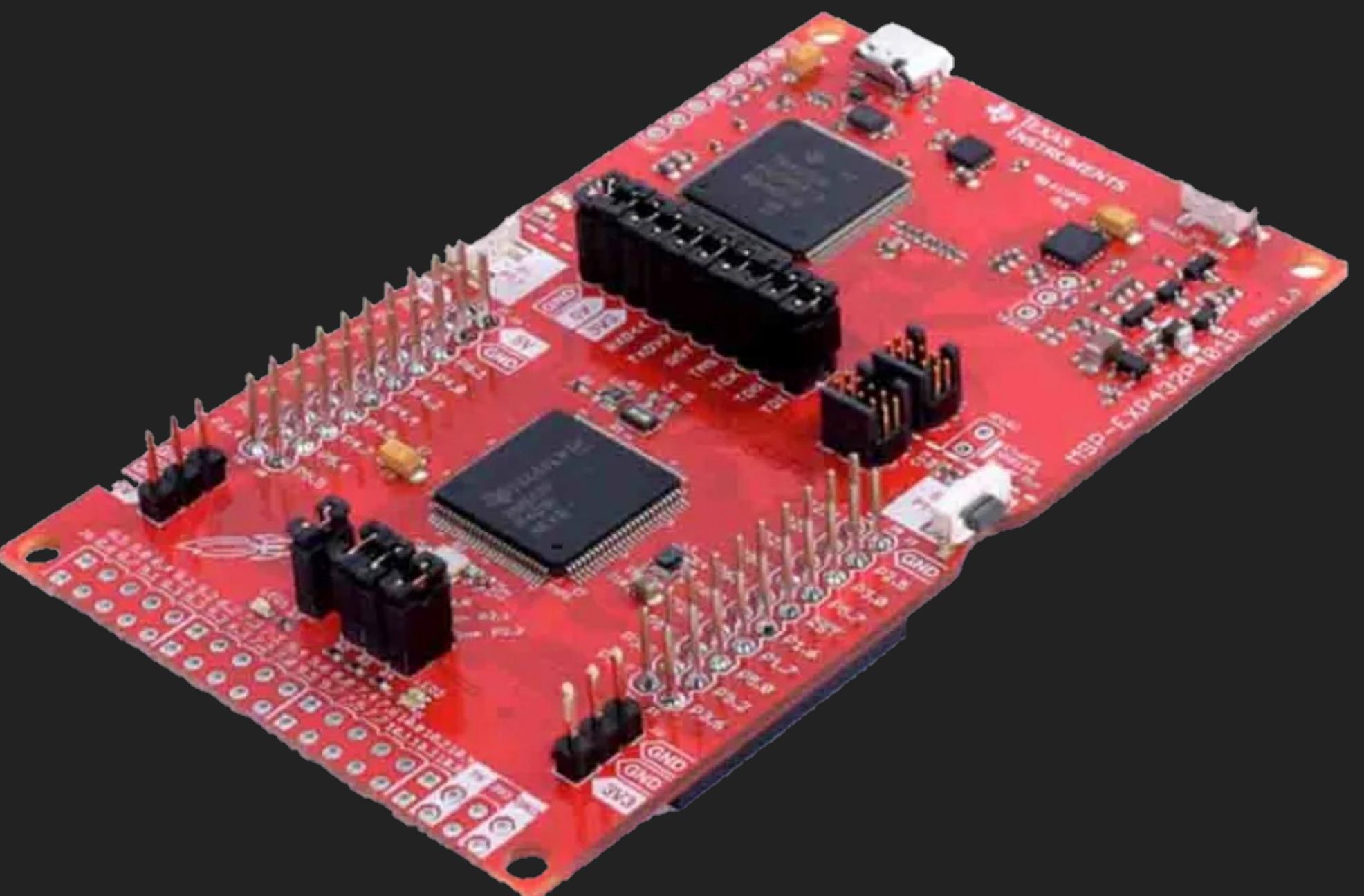
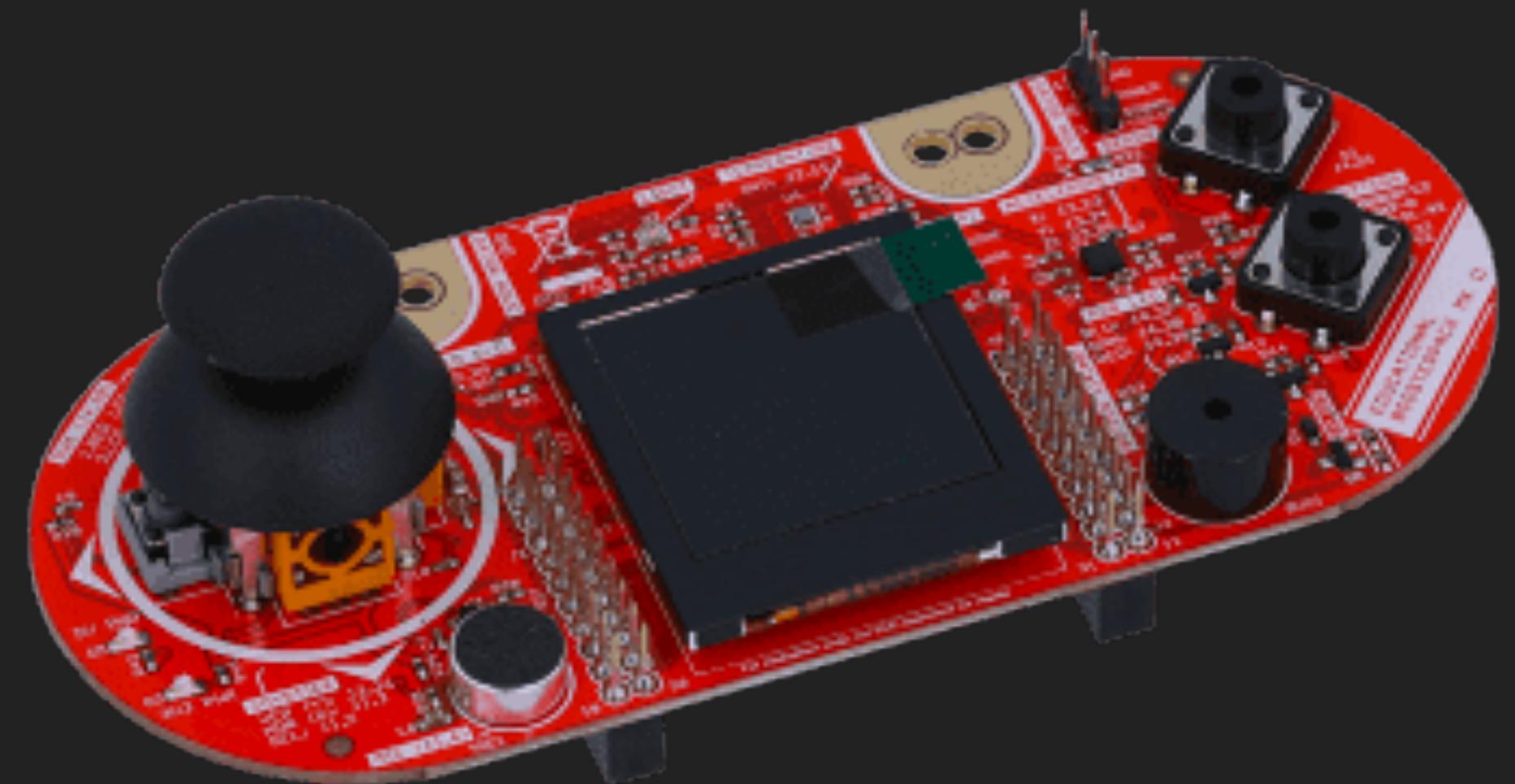
- ▶ Making the Spotify API usable with C
- ▶ Enable internet access (first through the CC3100, then with ESP32)
- ▶ Establish a communication protocol between the MSP and the ESP32
- ▶ Training a model to recognize sounds
- ▶ Integrating our ML model in our project

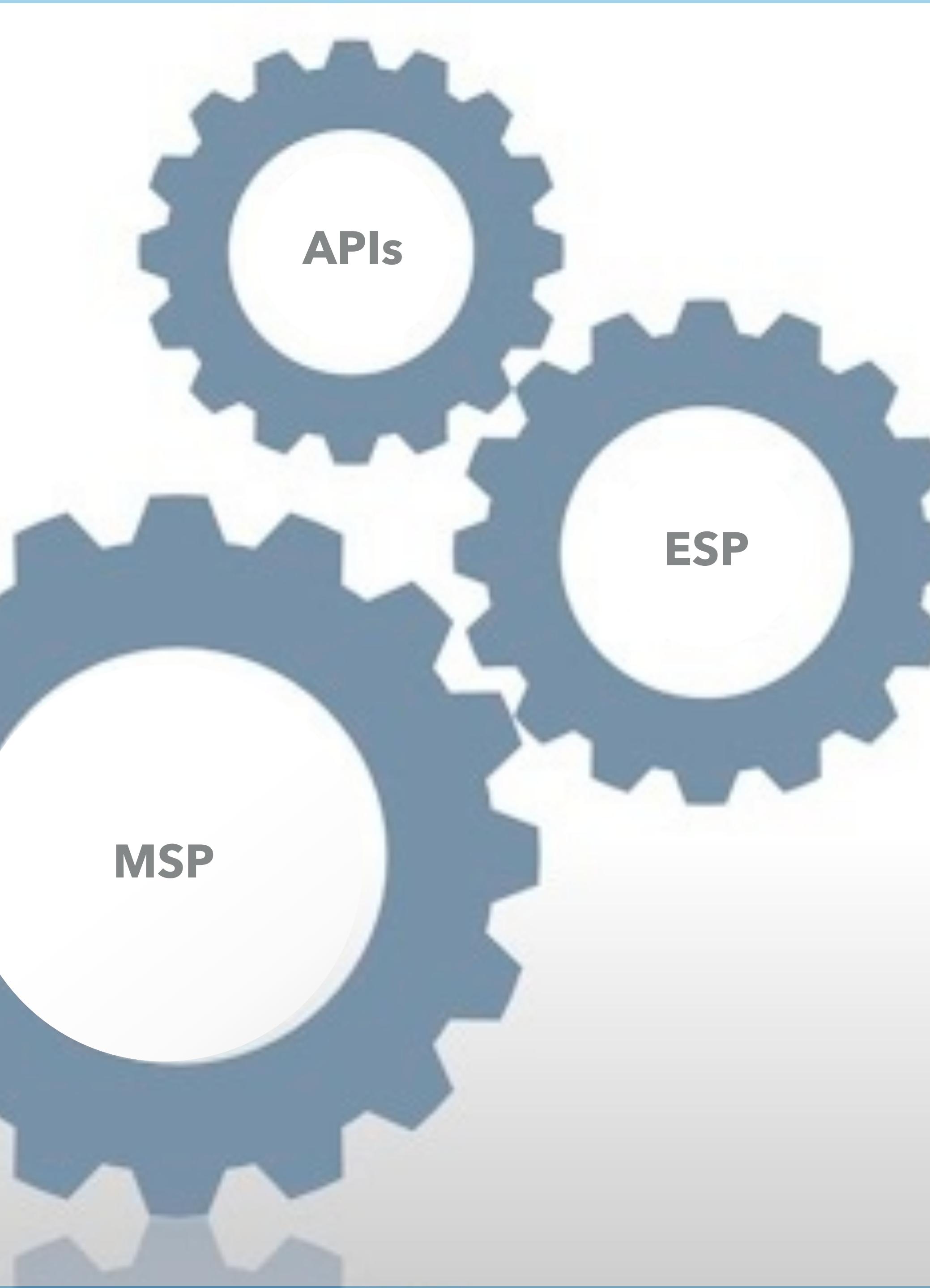


INTRODUCTION

HARDWARE

- ▶ MSP432P401R Launchpad
- ▶ MSP432P401R BoosterPackMKII
- ▶ ESP32
- ▶ USB cable
- ▶ Jumpers

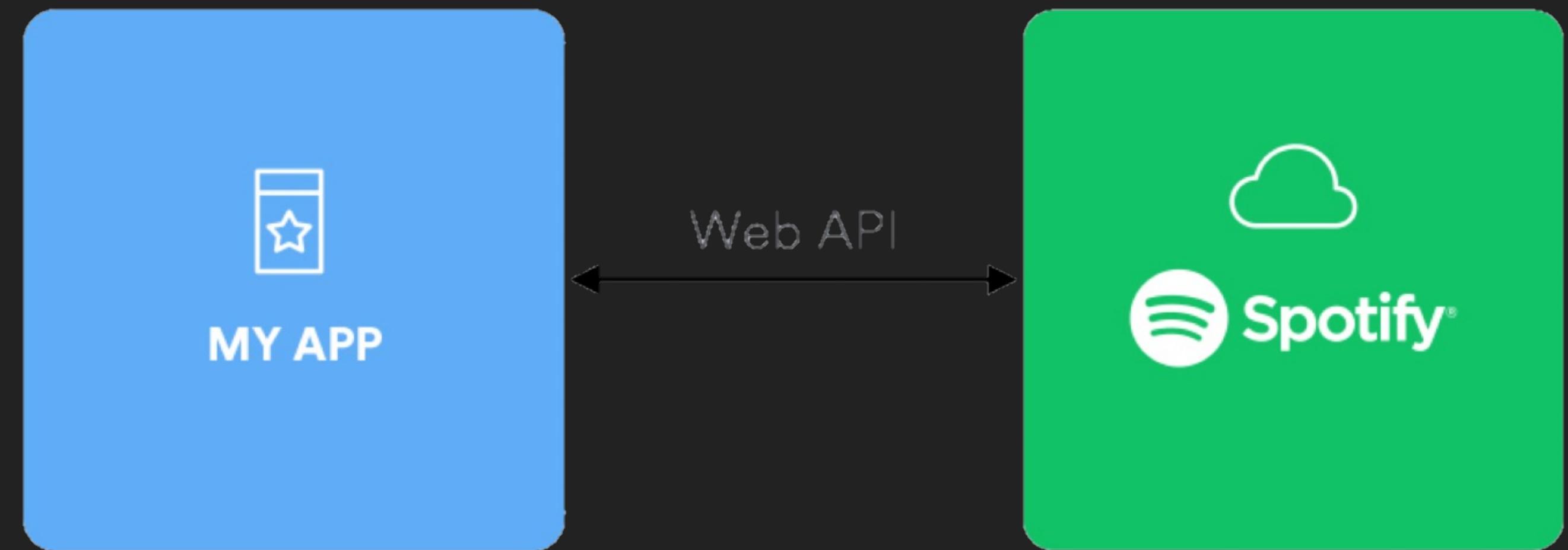




DEVELOPMENT

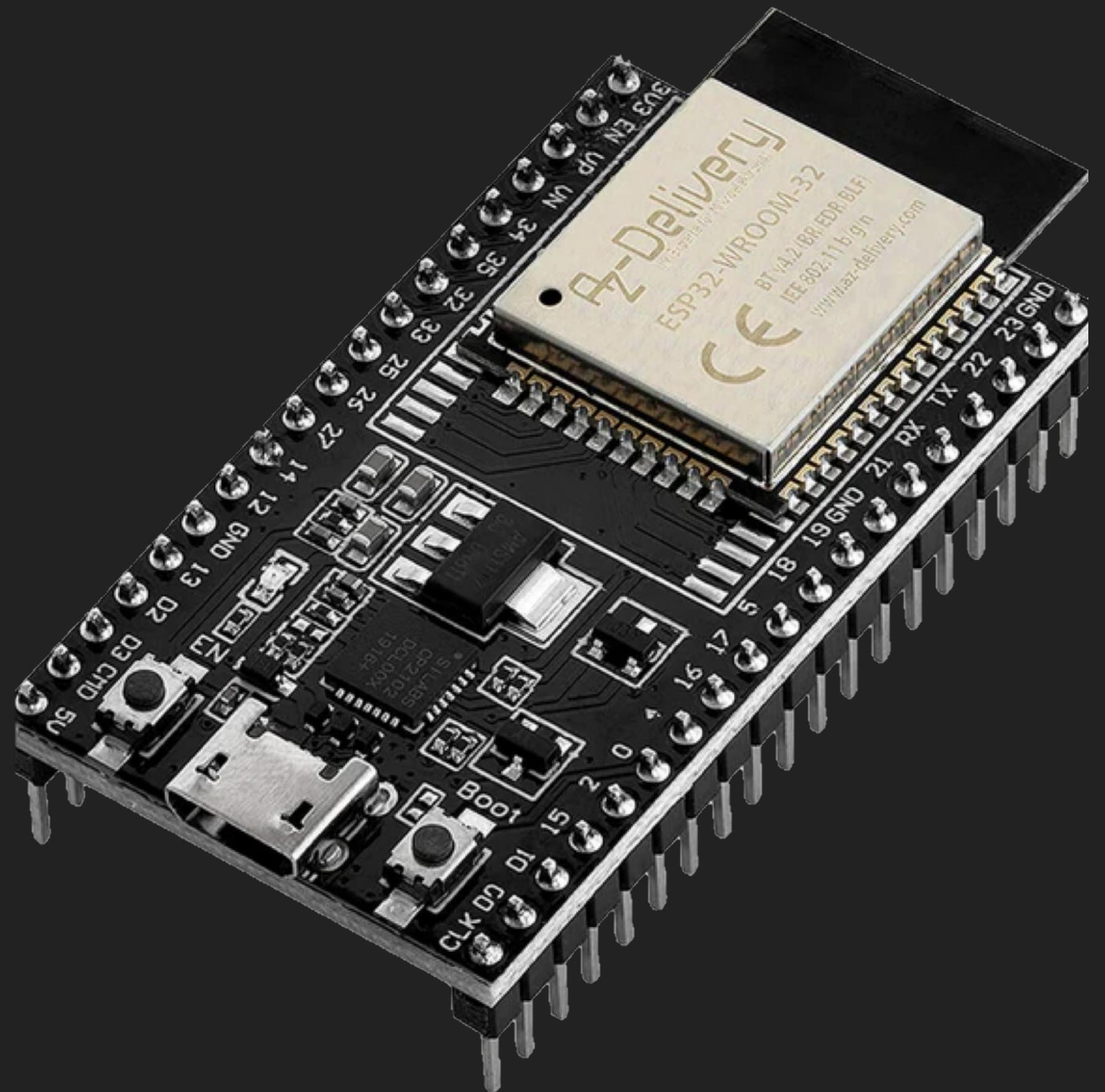
SPOTIFY APIs SIDE

- ▶ Spotify Dev
- ▶ Getting session token
- ▶ HTTP to use the APIs
- ▶ Parsing JSON responses



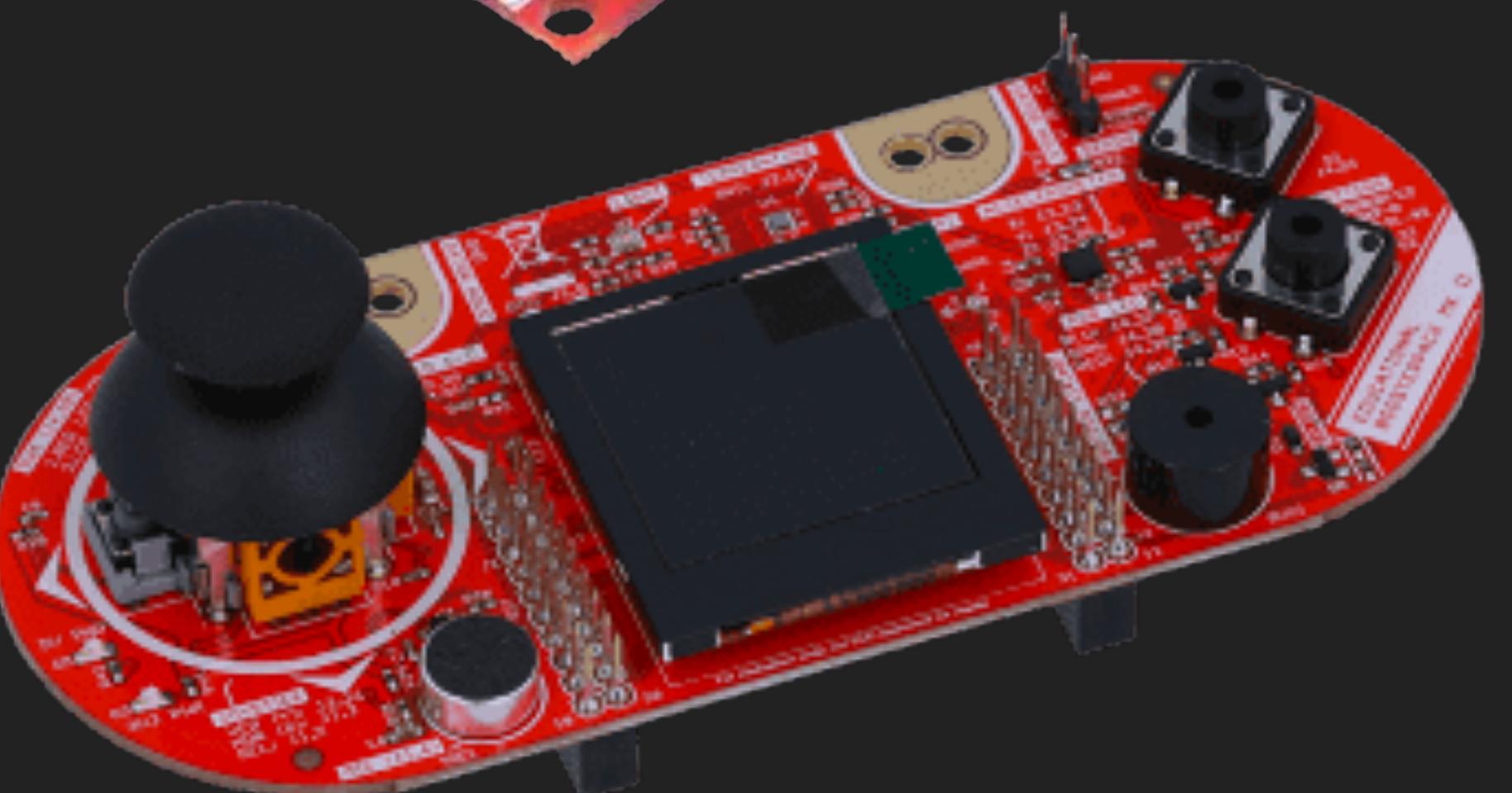
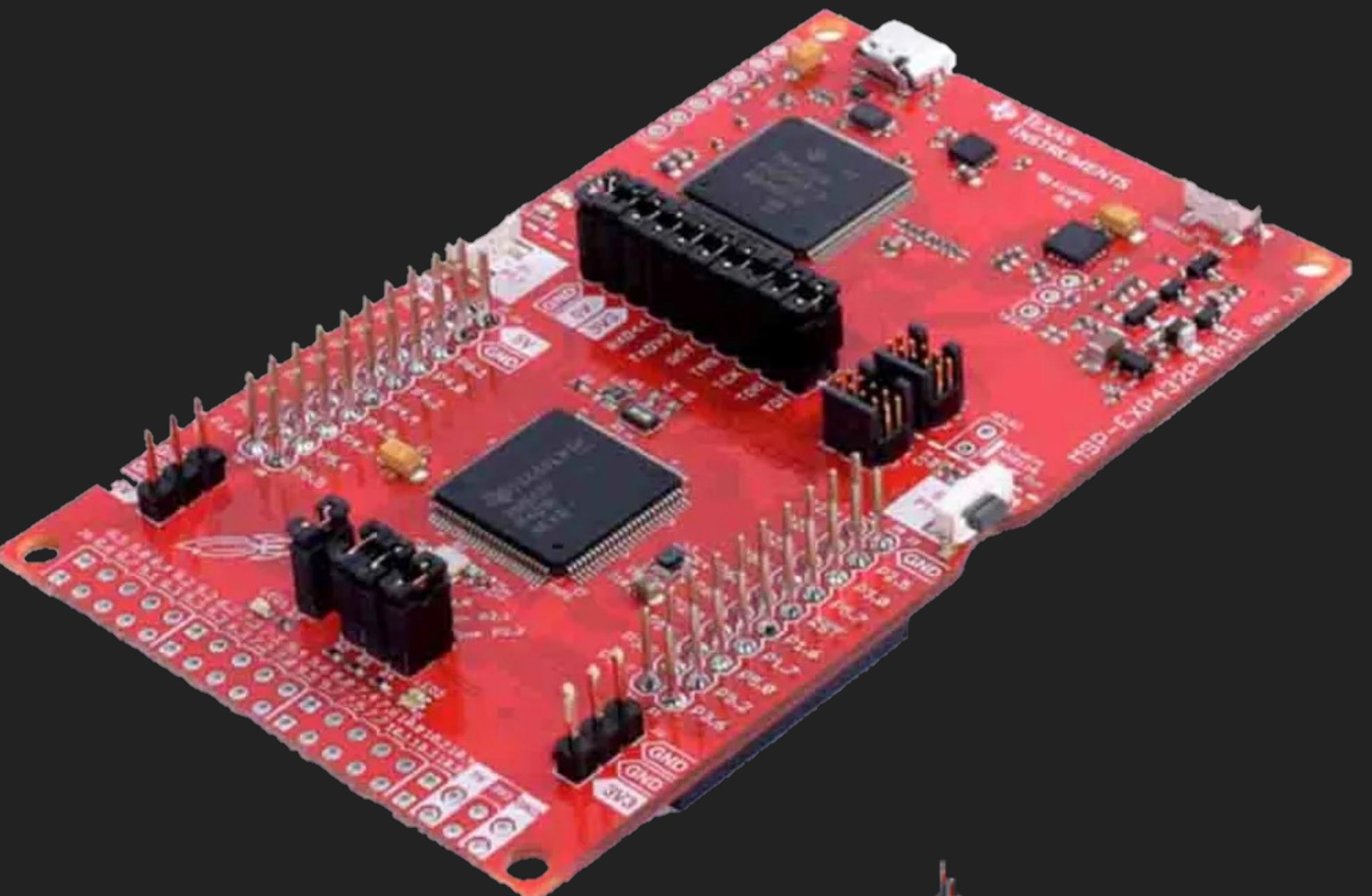
ESP DEVELOPMENT

- ▶ Connecting to WiFi
- ▶ Making HTTP requests to use Spotify APIs
- ▶ Parse and filter JSON responses
- ▶ Sending data through UART to MSP



MSP DEVELOPMENT

- ▶ Setting up interrupts with ADC
- ▶ Getting data parsed by ESP
- ▶ Designing "UI" on LCD screen
- ▶ Getting APIs response
- ▶ Finished!



OR SO WE THOUGHT...

- ▶ Defining an actual UART protocol
- ▶ LSB vs MSB dilemma
- ▶ Making UART work with LCD screen





FEATURES

Johnny Appleseed

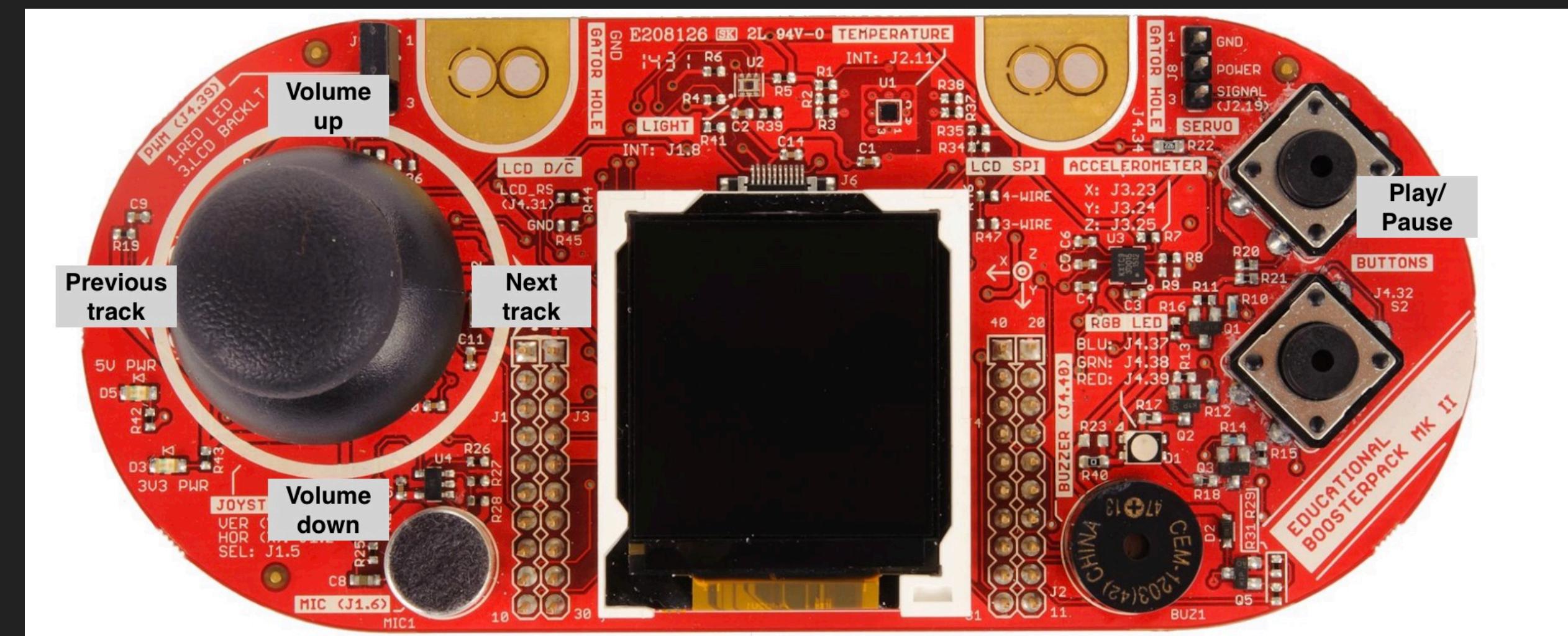
FEATURES

ACTIONS

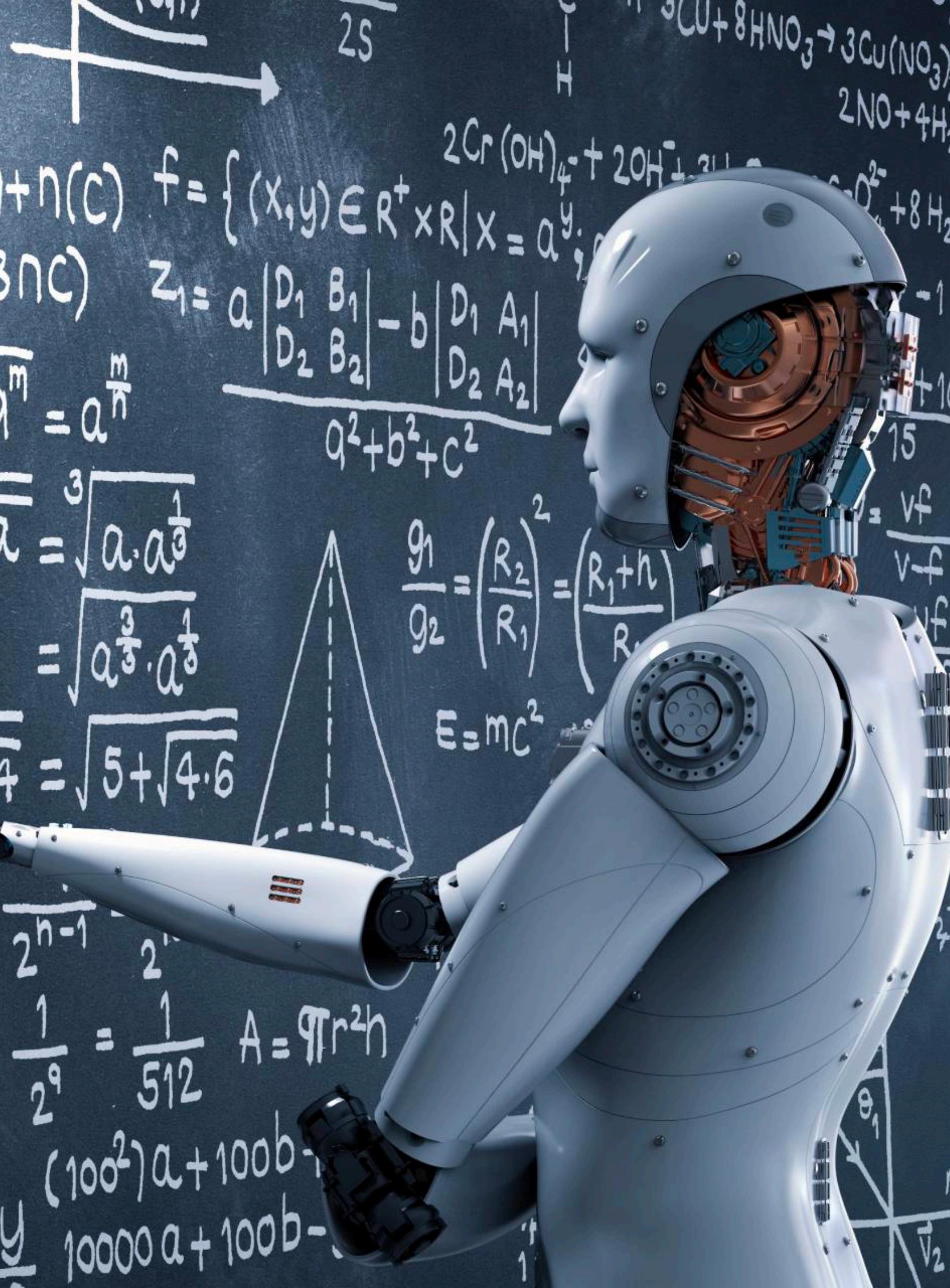
- ▶ 5 actions can be performed :
 - ▶ Volume Up/Down with joystick Y axis and accelerometer Z axis
 - ▶ Next/Previous song with joystick X axis
 - ▶ Play/Pause with Button

DISPLAY

- ▶ Currently playing artist and song name
- ▶ Dynamic volume bar visibility
- ▶ Spinning logo!



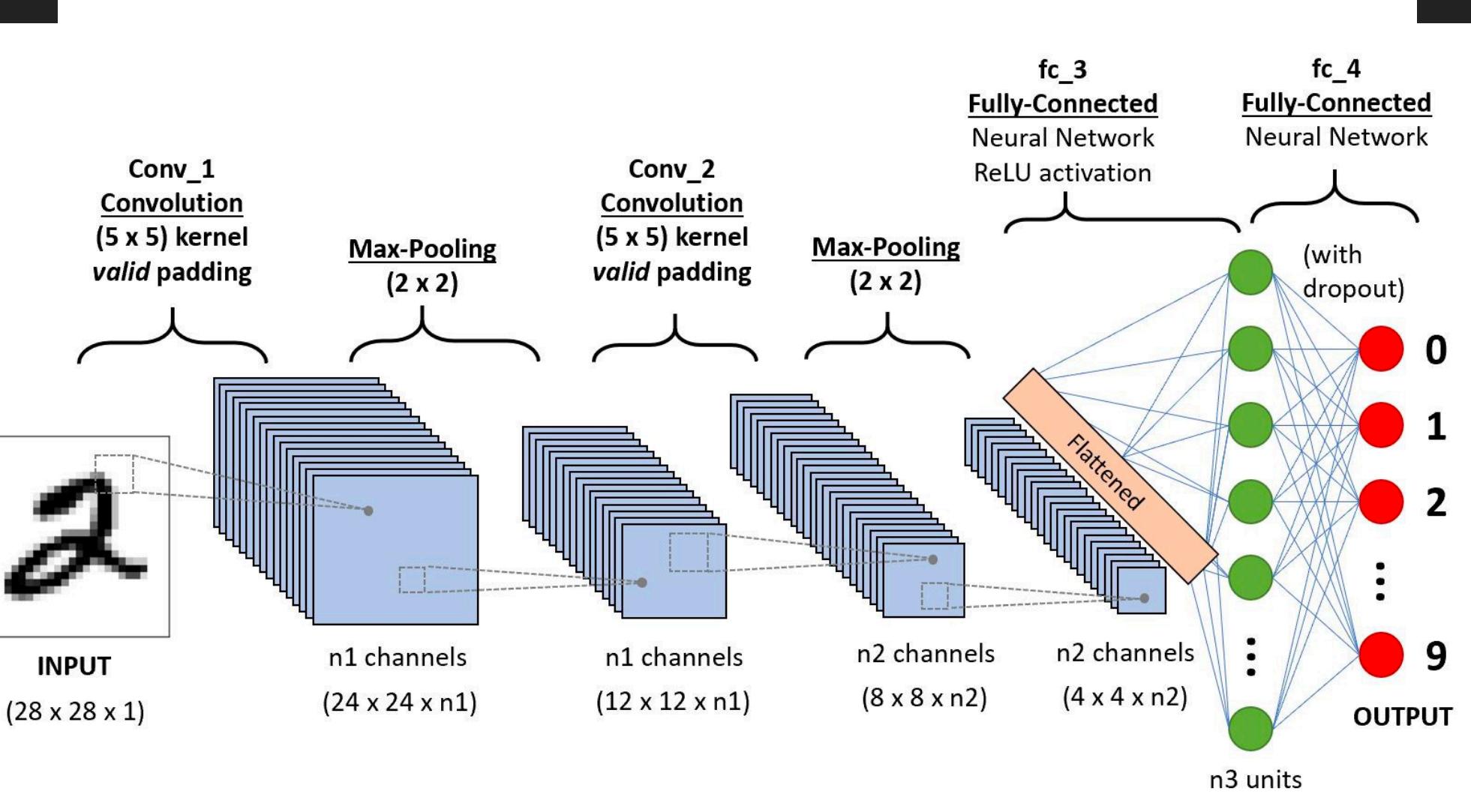
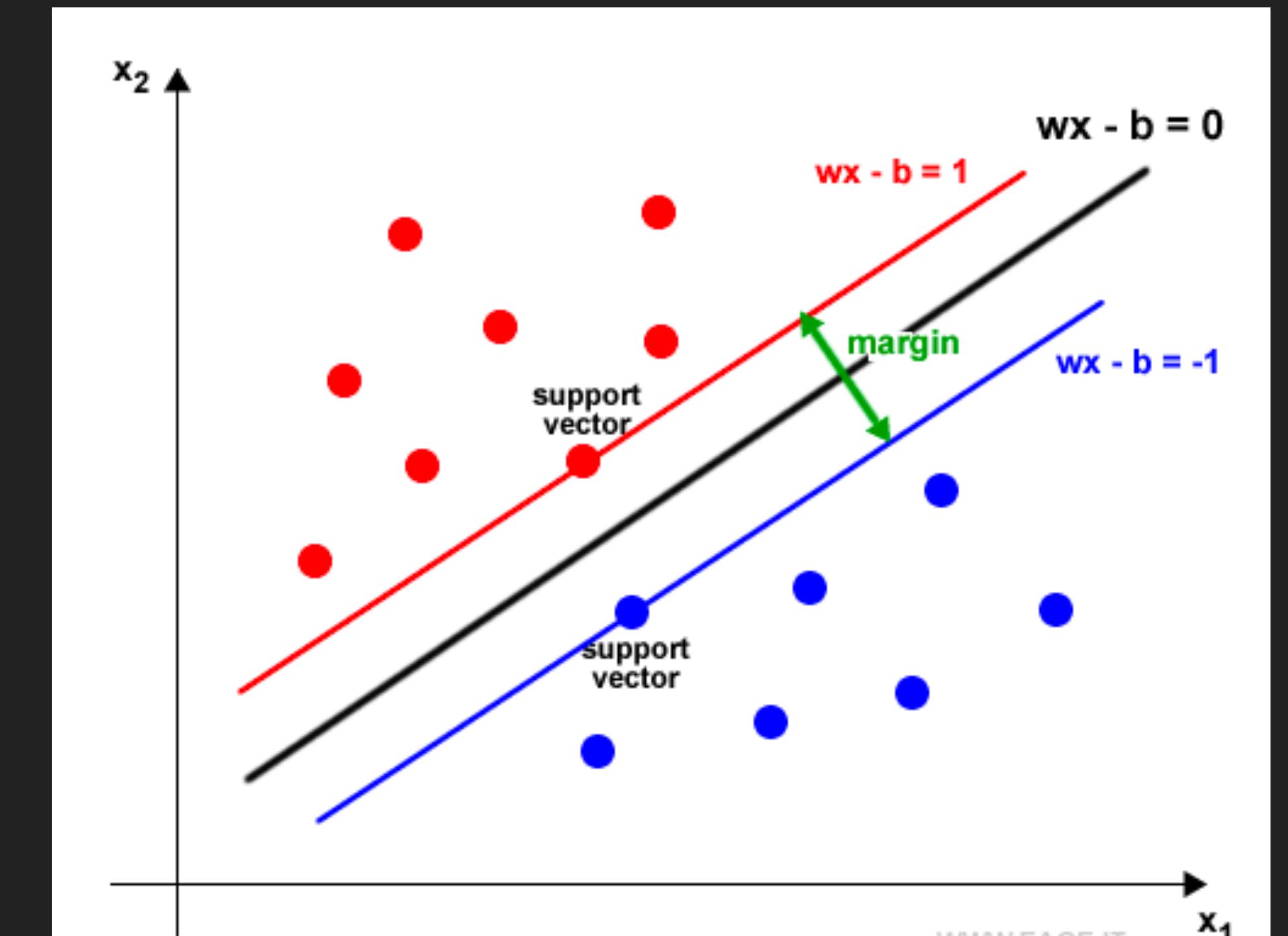
THE ML FAILURE



ISSUES

THE ML MODEL ROADMAP

- ▶ Getting the keyword dataset
- ▶ Implementing SVM
- ▶ Low accuracy on SVM (17%)
- ▶ Development of CNN using Edgelmpulse
- ▶ Test and integration with project
- ▶ Not implemented on our project...



TEXT

BUT CAN BE TESTED HERE!



CONCLUSION



COMMENTS

FINAL REMARKS

