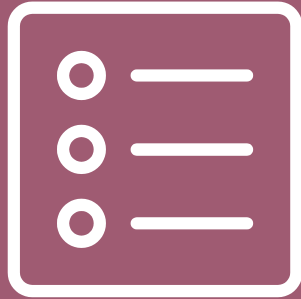


How & What?	01
Goal	02
Global Aspect	03
Simulations	04
Idea	05
Resources	06
Real-life Demo	07



Topic Will Be Discussed

How & What?

01

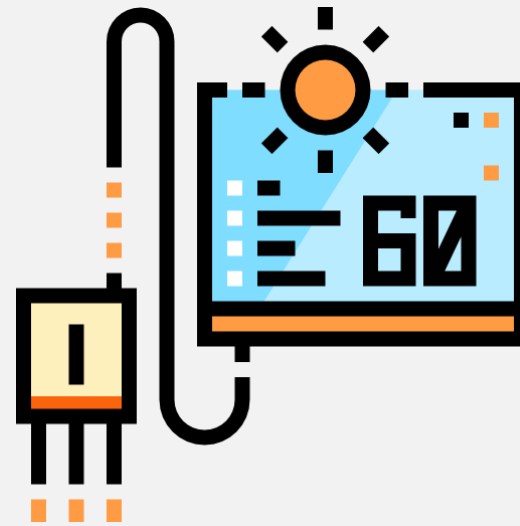
How?



How & What?

02

What?



Humidity

Temperature



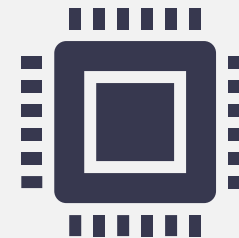
How & What?

02

What?

Embedded System

**Hidden computer that quietly works
inside everyday devices to make them
smarter and more efficient**



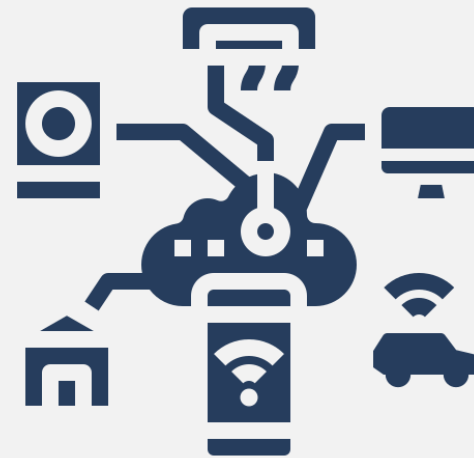
How & What?

02

What?

IOT

Internet Of Things
Connected



WHY ?



Goal

01

Change The World



Goal

02

My Target

Encourage

Global Aspect

01

**What is
Happening?**

Robotics



**Boston
Dynamics**

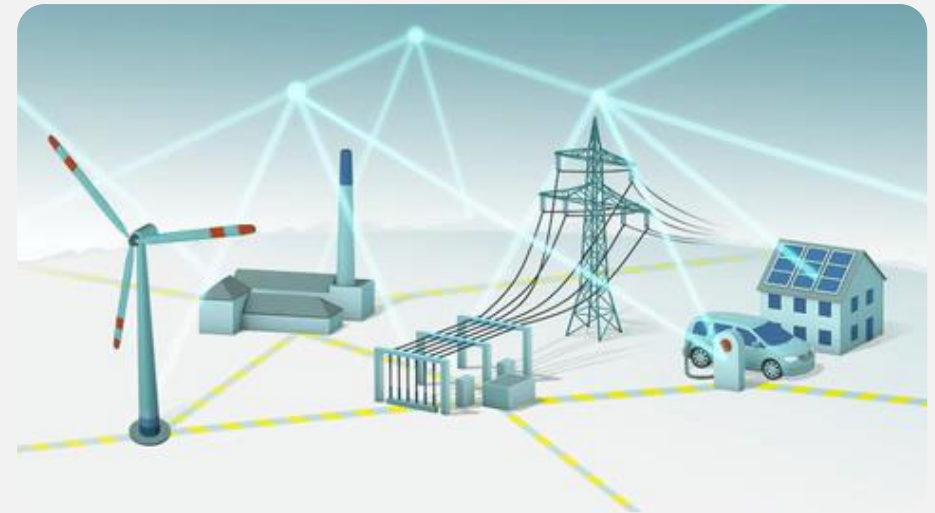
Global Aspect

02

**What is
Happening?**



Somewhere in Industry



Global Aspect

03

**What is
Happening?**



MIT Cheetah

Global Aspect

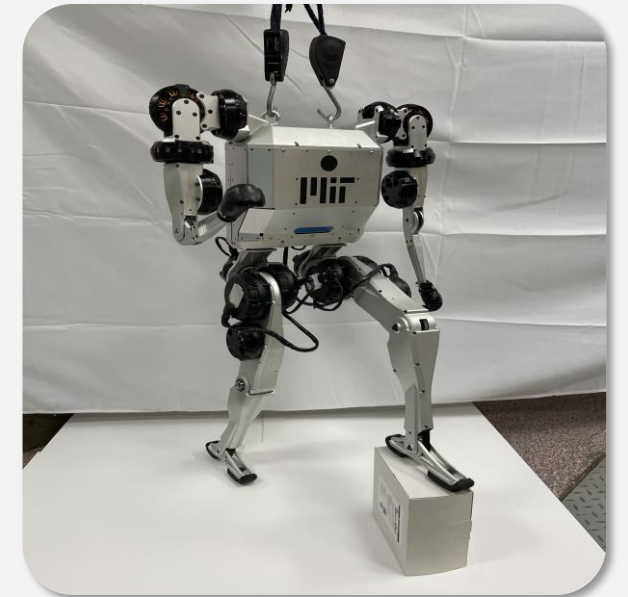
04

Who
are leading?



Carnegie Mellon
University

Massachusetts Institute of
Technology



Global Aspect

05

Who
are leading?



Stanford University



University of Tokyo

Global Aspect

06

Who
are leading?



University of California,
Berkeley

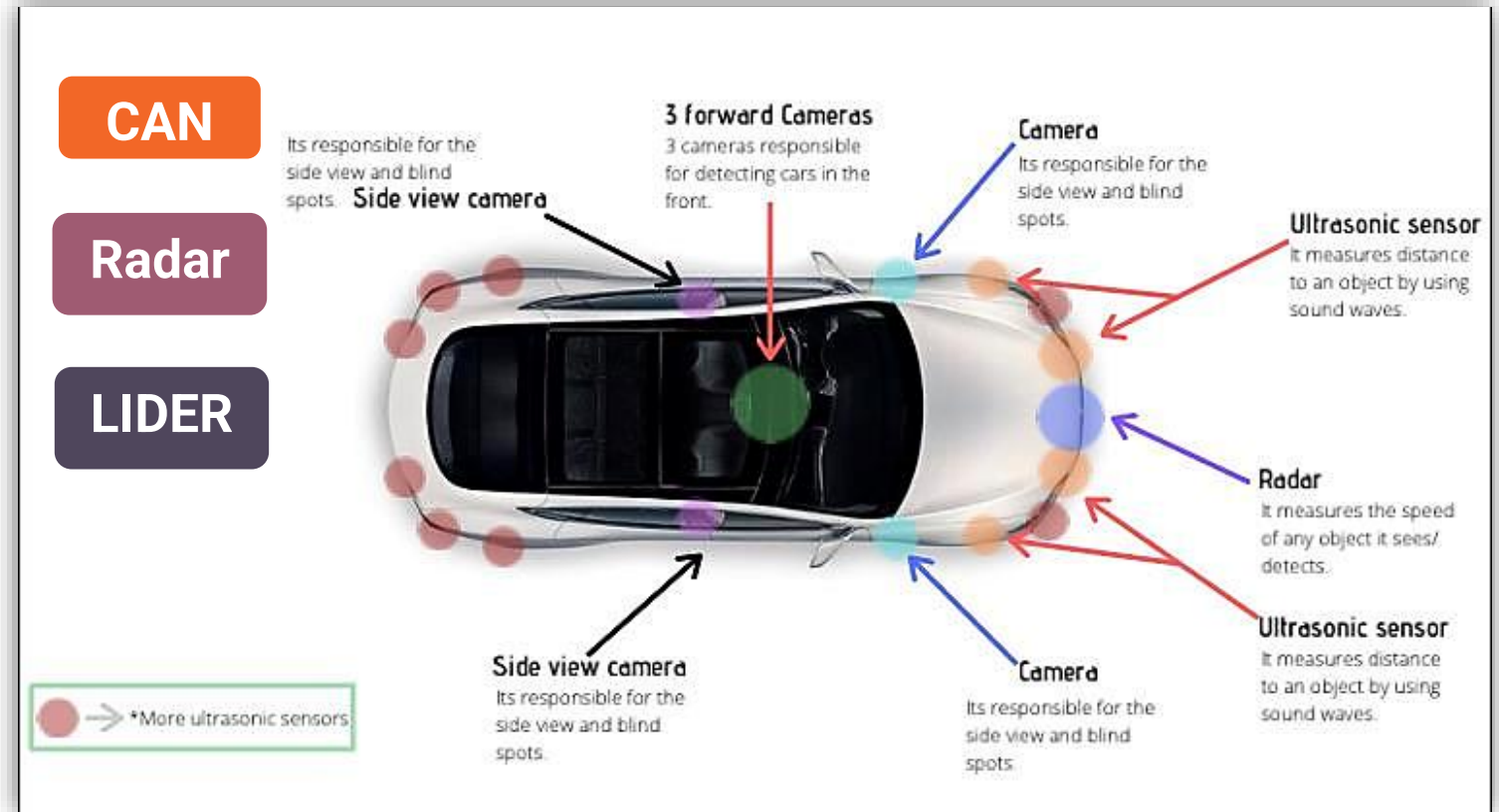
University of Pennsylvania



Global Aspect

07

Who
are leading?

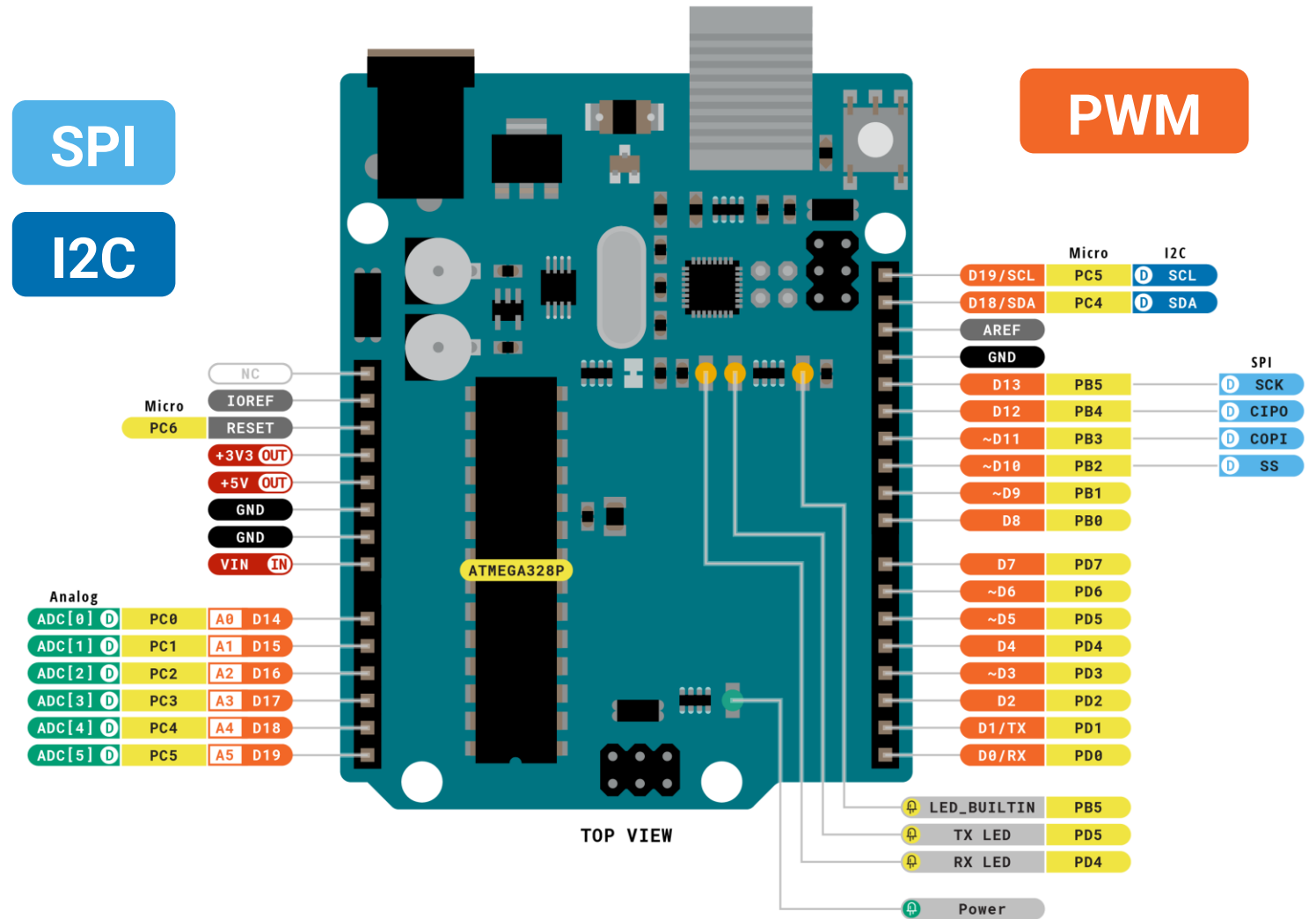


TESLA

Arduino

01

Dev
Boards



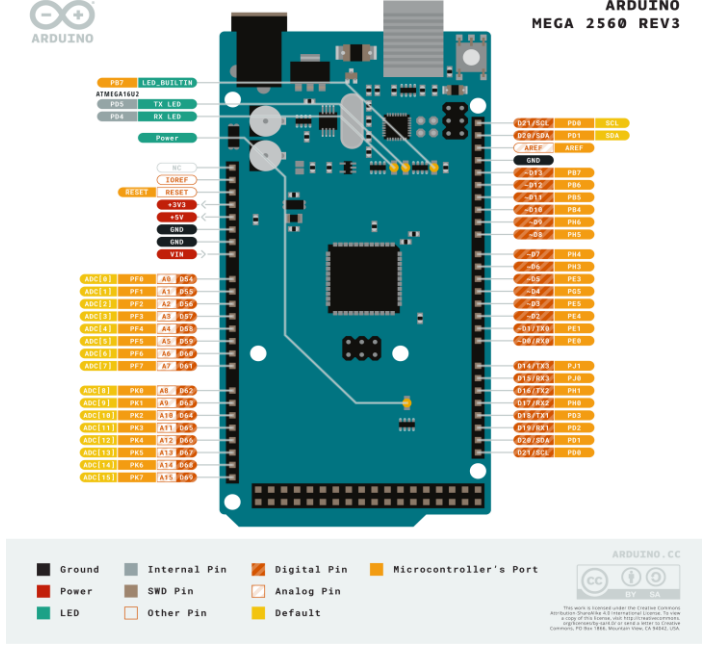
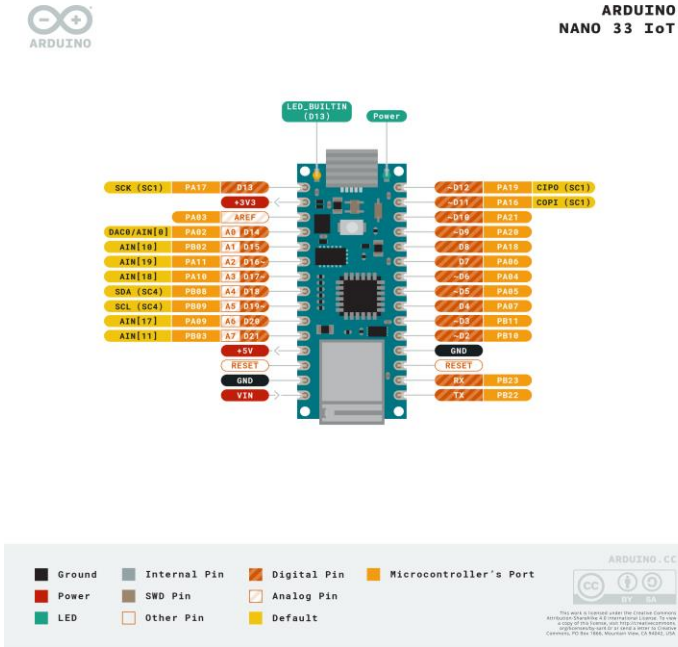
Legend:	Digital	I2C
Power	Analog	SPI
Ground	Main Part	Analog



ARDUINO UNO REV3
SKU code: A000066
Pinout
Last update: 6 Oct, 2022

02

Dev Boards

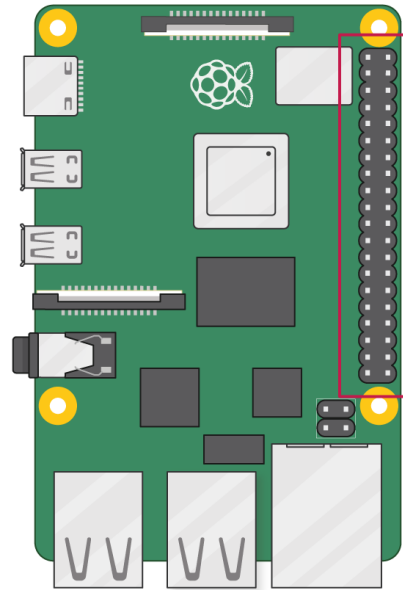


Raspberry Pi

03

Dev
Boards

Raspberry Pi



Mini Computer

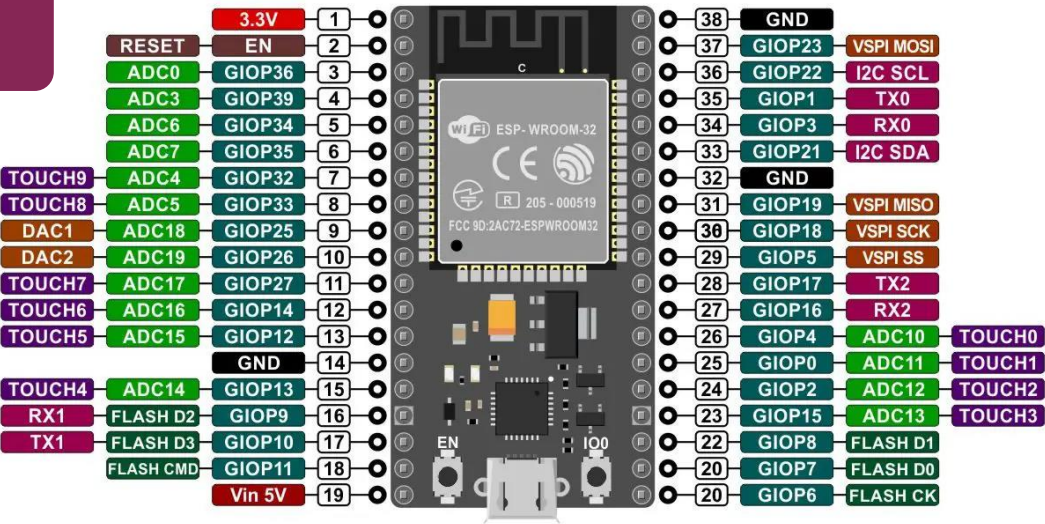
3V3 power	1	2	5V power
GPIO 2 (SDA)	3	4	5V power
GPIO 3 (SCL)	5	6	Ground
GPIO 4 (GPCLK0)	7	8	GPIO 14 (TXD)
Ground	9	10	GPIO 15 (RXD)
GPIO 17	11	12	GPIO 18 (PCM_CLK)
GPIO 27	13	14	Ground
GPIO 22	15	16	GPIO 23
3V3 power	17	18	GPIO 24
GPIO 10 (MOSI)	19	20	Ground
GPIO 9 (MISO)	21	22	GPIO 25
GPIO 11 (SCLK)	23	24	GPIO 8 (CE0)
Ground	25	26	GPIO 7 (CE1)
GPIO 0 (ID_SD)	27	28	GPIO 1 (ID_SC)
GPIO 5	29	30	Ground
GPIO 6	31	32	GPIO 12 (PWM0)
GPIO 13 (PWM1)	33	34	Ground
GPIO 19 (PCM_FS)	35	36	GPIO 16
GPIO 26	37	38	GPIO 20 (PCM_DIN)
Ground	39	40	GPIO 21 (PCM_DOUT)

ESP32

04

Dev
Boards

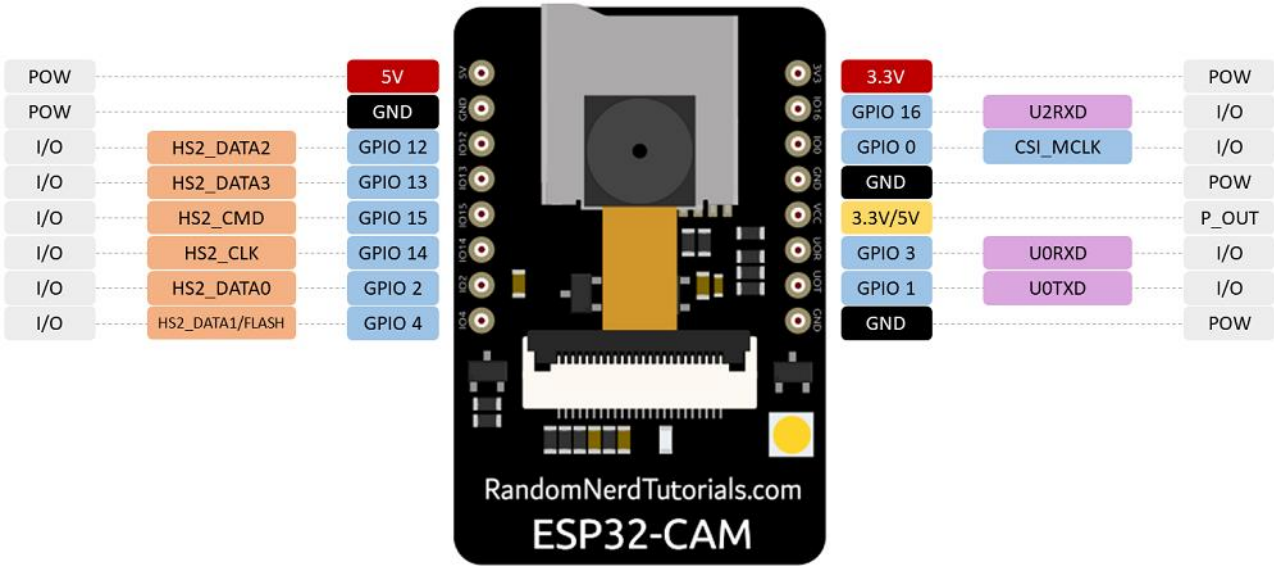
Wi-Fi



ESP32

BLE

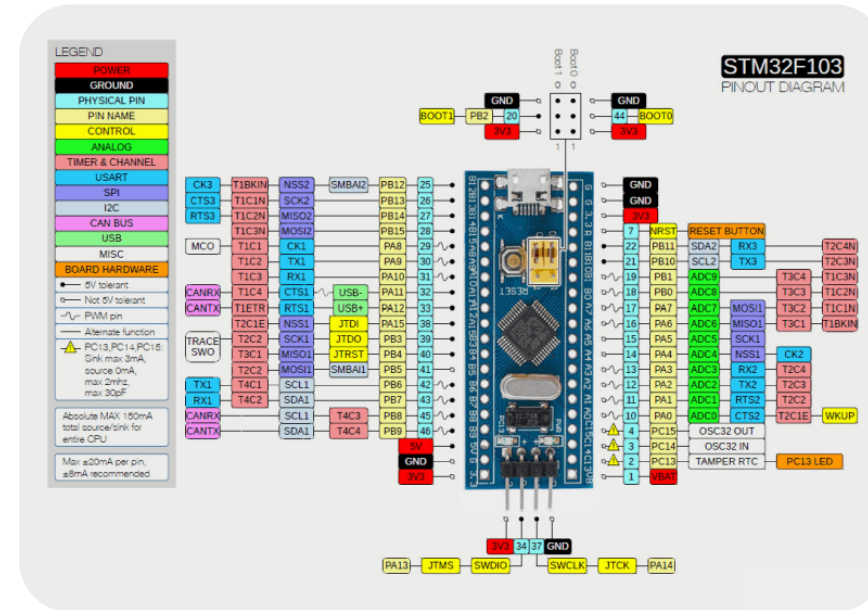
ESP32-CAM



05

Dev Boards

72 MHz



STM32 Black Pill Pinout

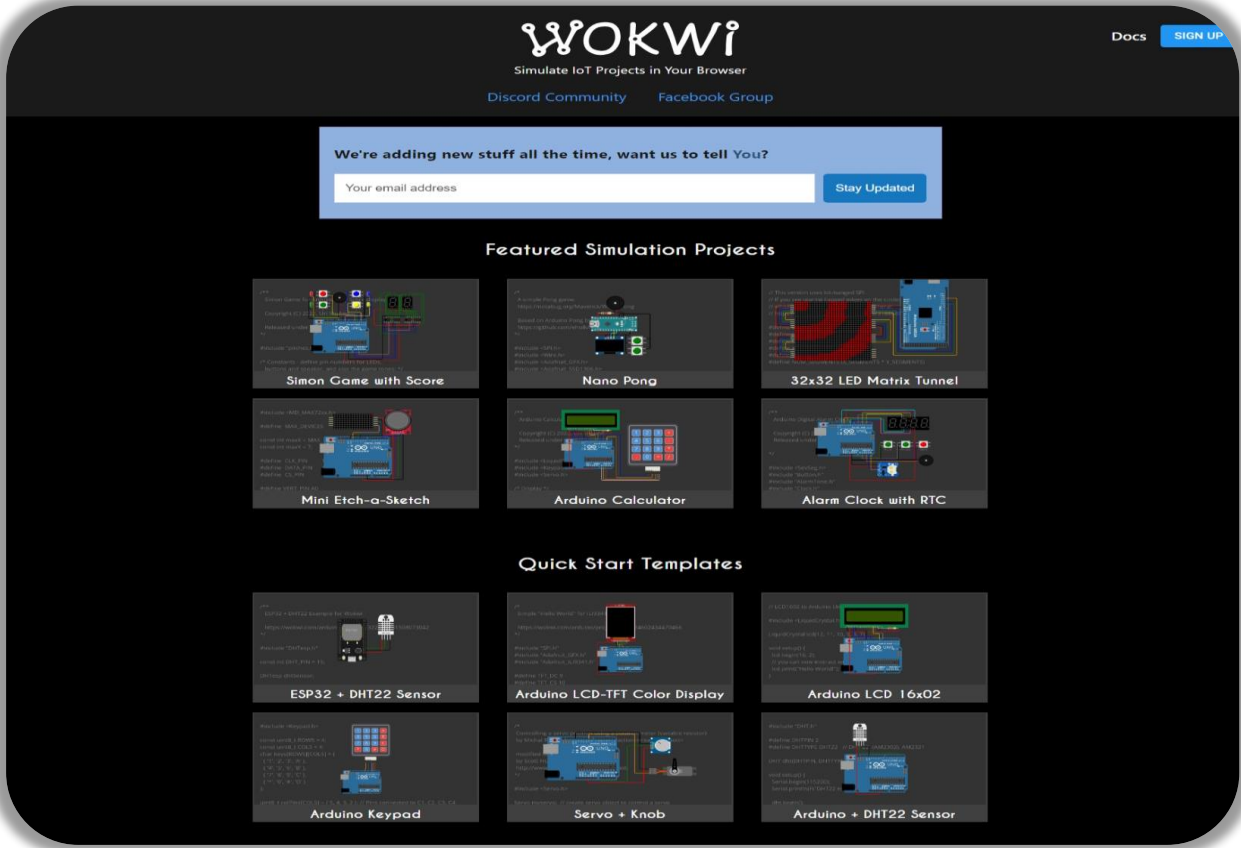
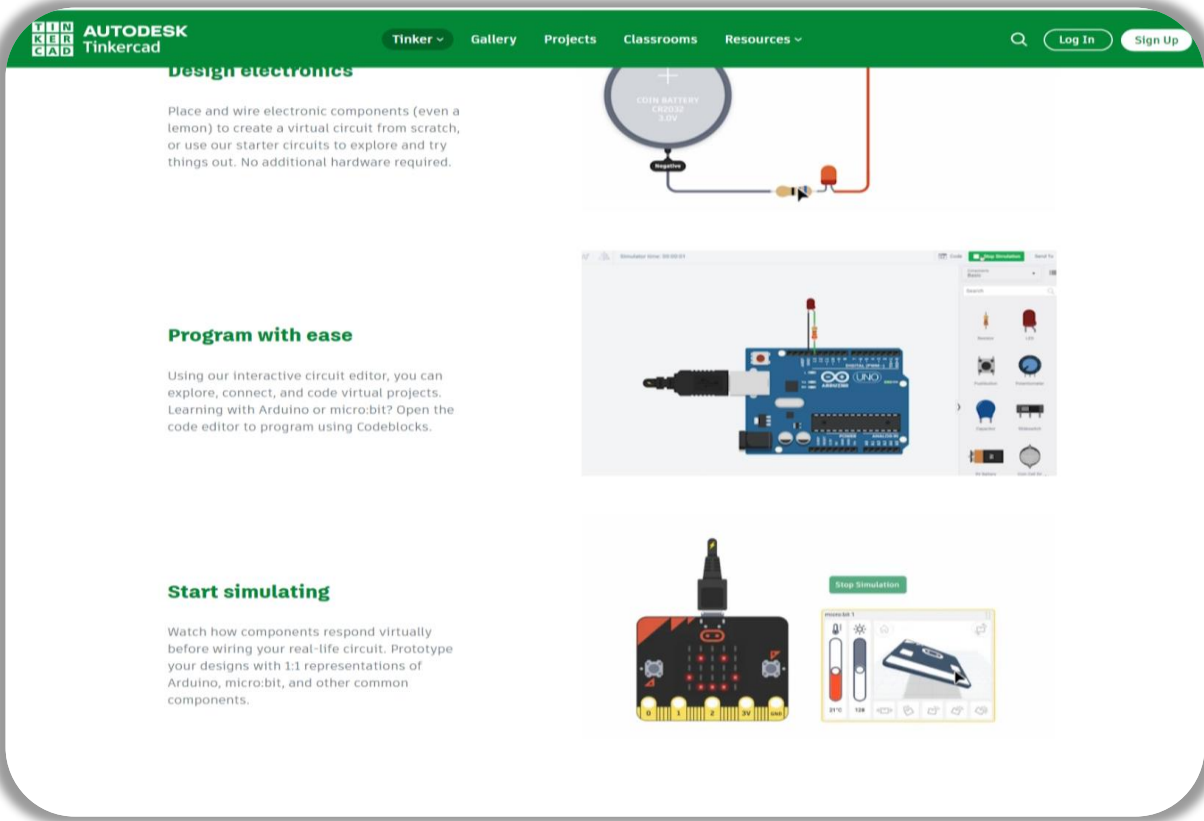
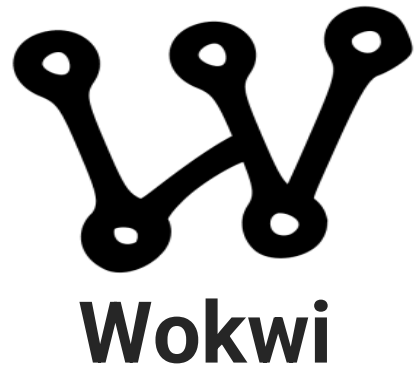
Pin	Function
●	5V Tolerant
○	3.3V Max
~~~~~	PWM Pin
■	Analog Pin
■	Serial Pin
■	JTAG Pin

SWCLK	SWIO	3.3V	GND
PA14	PA13	PA13	PA14

Normal Main Flash      Serial Programming      SRAM

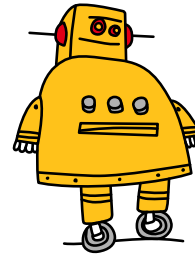


# Simulations



# AUTODESK Tinkercad

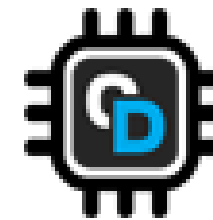
Idea



**AUTODESK**  
Instructables



**PROJECT HUB**



**CIRCUIT**  
DIGEST



**IOT PROJECT**  
OF THE YEAR

# Resources

01

## Sensors

- Temperature Sensor
- Humidity Sensor



- Pressure Sensor



0 - 50°C / $\pm 2^\circ\text{C}$	Temperature Range	-40 - 125°C / $\pm 0.5^\circ\text{C}$
20 - 80% / $\pm 5\%$	Humidity Range	0 - 100% / $\pm 2-5\%$
1Hz (one reading every second)	Sampling Rate	0.5 Hz (one reading every two seconds)
15.5mm x 12mm x 5.5mm	Body Size	15.1mm x 25mm x 7.7mm
3 - 5V	Operating Voltage	3 - 5V
2.5mA	Max Current During Measuring	2.5mA

- Light Sensor

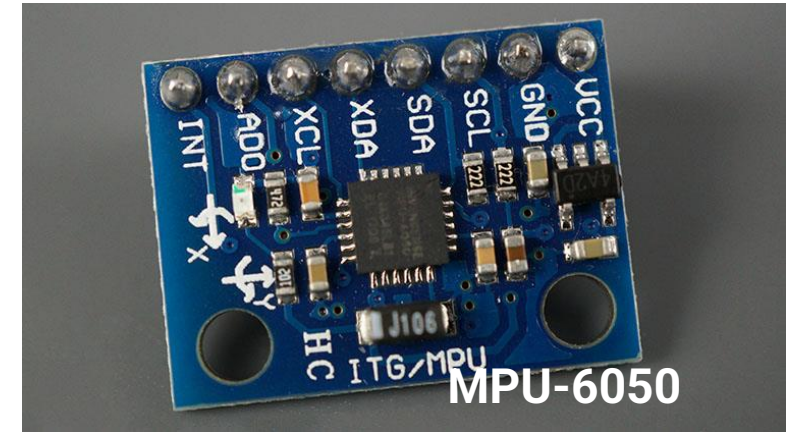


# Resources

02

## Sensors

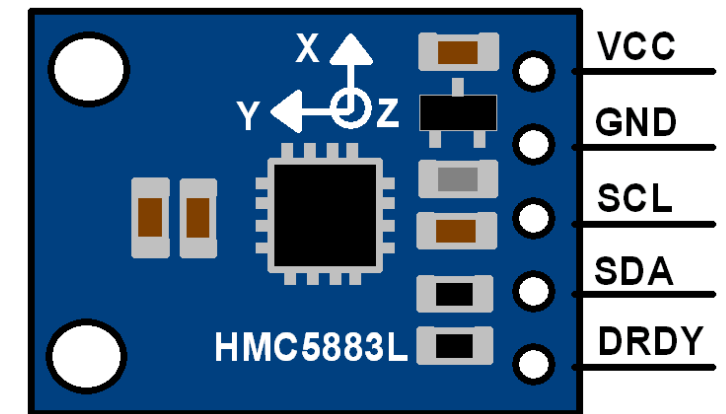
- Gyroscope  
Accelerometer Sensor



- Ultrasonic Sensor



- Magnetometer Module



HMC5883L



# Resources

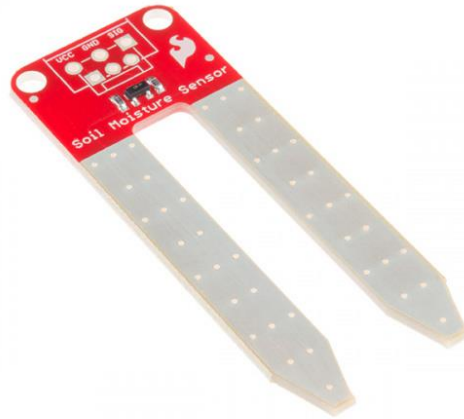
03

## Sensors

- PIR Motion Sensor



- Soil Moisture Sensor



- Flammable Gas & Smoke Sensor



MQ-2

# Resources

04

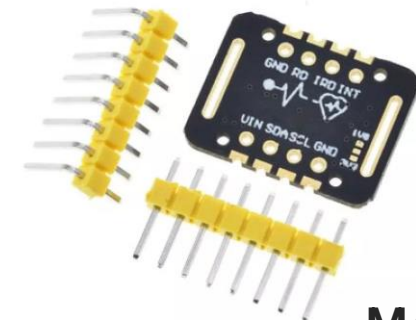
## Sensors

- Gas Sensor



**MQ-135**

- Heart Rate Sensor



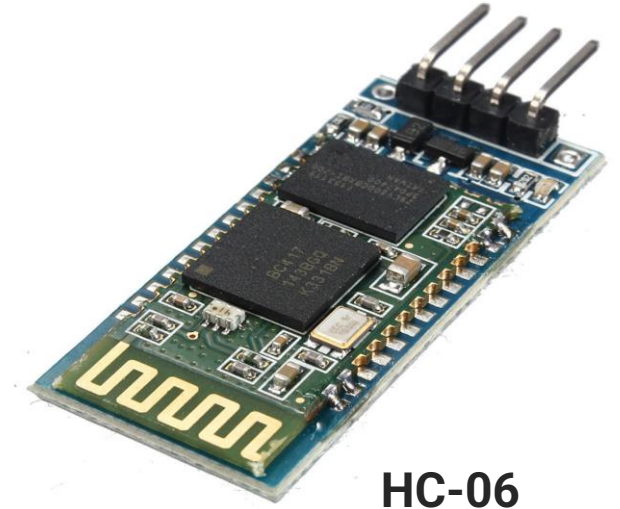
**MAX30102**

# Resources

04

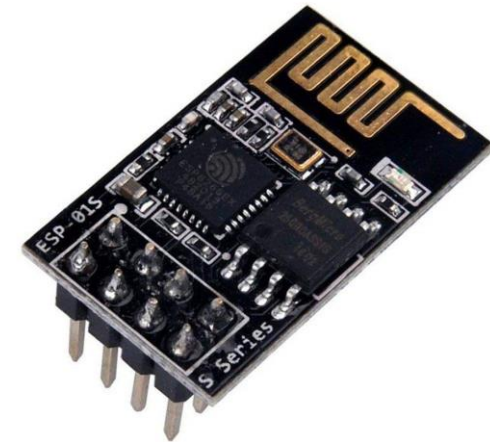
## Connectivity

- Bluetooth Module



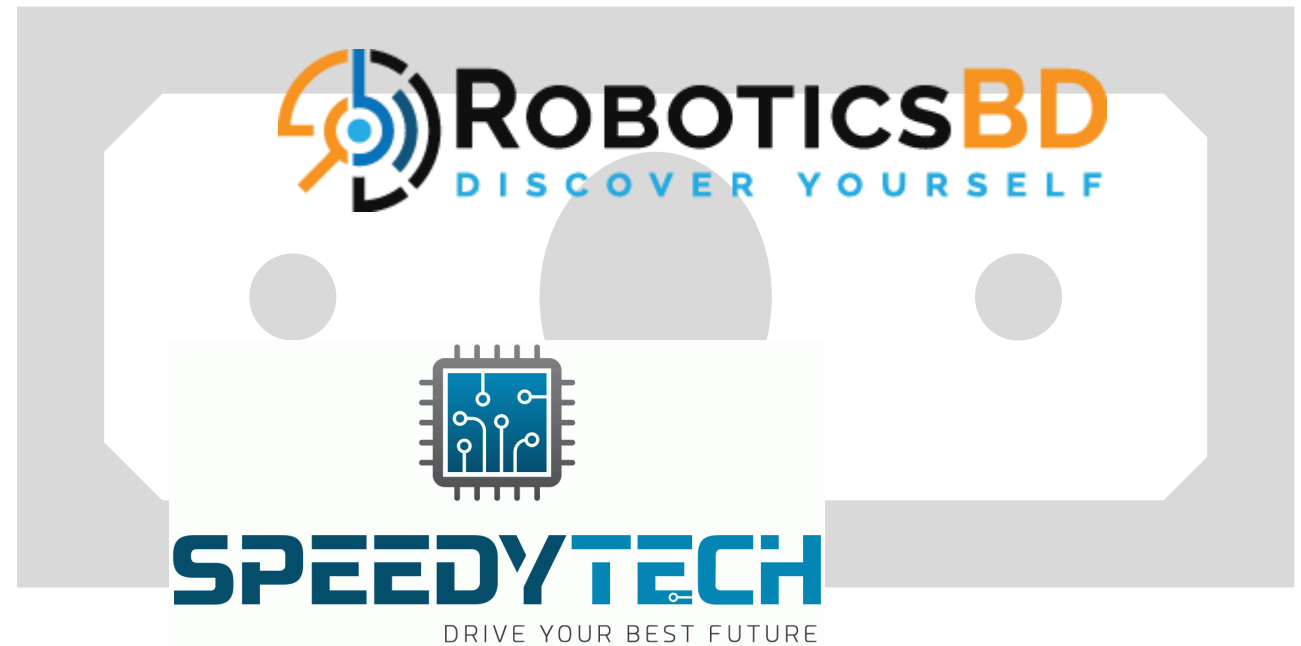
HC-06

- Wifi Module



ESP8266 ESP-01S

# Where To Get?



Expenses ?

# Real-life Demo



# Real-life Demo



Braille Translator



# Conclusion



IoT is not just about connecting things; it's about connecting possibilities and creating a smarter, more connected world.