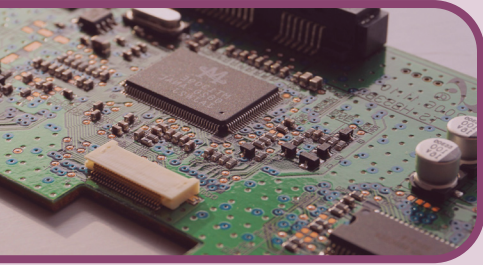


## TOOLS OF THE TRADE

# ARDUINO-ESP32



**CONCEPT** Microcontrollers provide the logic between sensors and actuators. With advances in communication protocols like LTE and LoRaWAN, these microcomputers operate embedded systems all around the world.

## EXAMPLES

Here are just a few MCU examples and how they might be able to take your projects from concept to reality!

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards can read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board.

Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. The Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments.

There are many other microcontrollers and microcontroller platforms available for physical computing. Arduino simplifies the process of working with microcontrollers, but it offers some advantage for teachers, students, and interested amateurs over other systems:

- Inexpensive
- Cross-platform
- Simple, clear programming environment
- Open source and extensible software and hardware

ESP32 is a MCU (microcontroller unit) with integrated Wi-Fi and Bluetooth connectivity for a wide-range of applications. It is highly used for mobile devices, wearable electronics and IoT applications. ESP32 can perform as a complete standalone system or as a slave device to a host MCU, reducing communication stack overhead on the main application processor. ESP32 can interface with other systems to provide Wi-Fi and Bluetooth functionality through its SPI / SDIO or I2C / UART interfaces. Manufactured by Espressif, many different ESP32 variations now exist depending on your specific needs.

