

Introduction to Single Board Computer (SBC)

AN OVERVIEW OF RASPBERRY PI ZERO 2W

Overview

- Introduction to SBC
- Overview of Raspberry Pi Zero 2 W and its benefits
- Getting started with RPi Zero 2 W
- Programming and development with RPi Zero 2W

What is a Single Board Computer (SBC)?

- A complete computer built on a single circuit board.
- Processor, memory, storage, and input/output options, all in one compact package.
- Affordable compared to traditional PCs
- Can be used for a variety of projects, from education to industrial applications
- Low power consumption

Popular SBCs

- Raspberry Pi
- Orange Pi
- BeagleBone



Fig: Raspberry Pi



Fig: Orange Pi



Fig: BeagleBone Black

Raspberry Pi Zero 2W: An Introduction

- A small, low-cost, and powerful version of the Raspberry Pi
- Ideal for embedded AI projects
- Quad-core ARM Cortex-A53 (1 GHz), 512 MB LPDDR2, Wi-Fi (802.11 b/g/n), Bluetooth 4.2
- Mini HDMI for display and microSD card for OS and data
- 40 GPIO pins
- Requires 5V power supply via Micro-USB
- Smaller than a credit card (65mm x 30mm)

Why Raspberry Pi Zero 2W?

- Very affordable (~\$15) and low power consumption
- Small enough for portable or embedded applications
- Good online community support for troubleshooting, tutorials, and projects
- Ideal for learning programming, electronics and prototyping

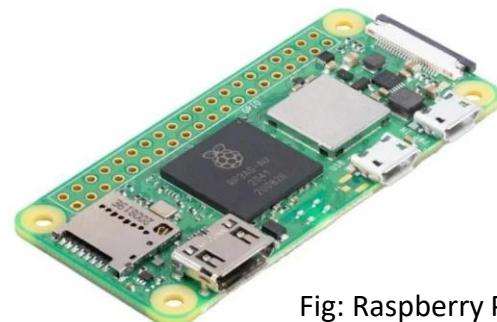


Fig: Raspberry Pi Zero 2 W

Getting Started with RPi Zero 2W

- Download Raspberry Pi OS from the official website
- Flash the OS onto the microSD card using tools like Etcher
- Insert the microSD card into the Raspberry Pi Zero 2W
- Power up and follow on-screen instructions to complete the setup

Programming and Development on RPi Zero

- Python is most common for embedded ML projects
- C/C++ can be used for more complex projects with hardware control
- A Linux-based OS (Raspberry Pi OS) designed specifically for the Raspberry Pi
- Can be run in GUI or headless mode (without a monitor)
- GPIO libraries for interfacing with external sensors, LEDs, motors
- PiCamera for camera-based projects

Thank You

Any Questions?