

The background of the slide is a photograph of a mountain range. The mountains are layered, with the closest ones in the foreground and more distant ones fading into the background. The entire scene is covered with a light blue mist or fog, giving it a serene and atmospheric feel. The colors are various shades of blue, from a pale sky blue to a deeper blue in the shadows of the mountains.

# **Chapter I**

# **Introduction**

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10. Digital Communication

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# Embedded Systems

- ❑ Embedded systems
  - ❑ Field-programmable gate arrays (FPGA),
  - ❑ System on chip (SoC) structures
  - ❑ Embedded Linux based systems (such as Raspberry Pi)
  - ❑ Microcontrollers
- ❑ Advantages and disadvantages of embedded systems.
- ❑ The evolution of microprocessors and how do embedded systems fit into this time line.

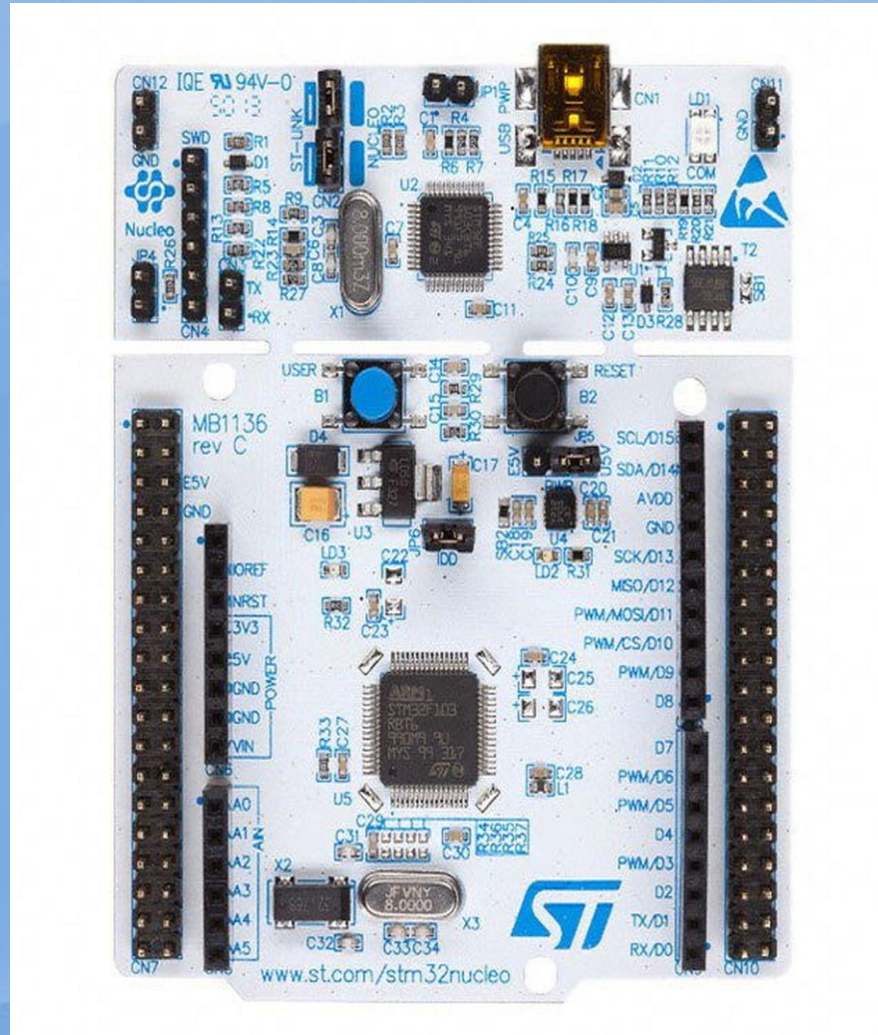
# Microcontrollers and Their Usage Areas

- ❑ Microcontrollers belong to a larger family of microprocessors.
  - ❑ A microprocessor does not contain a peripheral unit.
  - ❑ A microcontroller should contain its peripherals to interact with the outside world.
- ❑ The microcontroller usage had two major boosts in recent years.
  - ❑ The maker movement promoted microcontrollers to solve various real-life problems.
  - ❑ Internet of things (IoT) applications has started changing all aspects of our lives, for good. IoT need at least one microcontroller to begin with.
- ❑ Therefore, learning and applying microcontroller concepts are becoming a must for a fresh graduate.

# Overview of Arm Cortex M Architecture

- ❑ The Arm Cortex M architecture.
- ❑ Benefits of using an Arm Cortex M architecture based microcontroller.
- ❑ Generality of the ARM Cortex M architecture.

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# Web Sites

## ❑ ST Microelectronics

<https://www.st.com>

## ❑ arm

<https://www.arm.com/>

## ❑ Mbed

<https://simulator.mbed.com/>

<https://os.mbed.com/>

<https://os.mbed.com/studio/>

## ❑ Piazza

<https://piazza.com>

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