ADVI-Internship

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BOARDS

STM32 Board (Key features & Specifications):-

Core & Speed :

- ARM Cortex-M (M0 to M7)

- clock speeds ranges from 32 MHz to 550 MHz.

Memory :

-2MB Flash

- 1MB RAM and it also have external memory capability.

Connectivity :

-It supports UART, SPI, I2C, USB, Ethernet, Wi-Fi, Bluetooth .

Peripherals :

-168 GPIOs, 12-16 bit ADC, DAC, PWM, timers, camera & display interfaces.

Power Efficiency :

-Ultra-low-power modes, STM32L series takes as little as 100nA.

Programming :

-Utilizes STM32CubeIDE, Keil, Arduino IDE, with HAL & LL drivers.

Applications:

-Used in IoT(smart watches), industrial automation, robots(cameras), medical applications(Oximeter), automotive, and consumer appliances.

ESP32 Board (Key features & Specifications):-

Core & Speed:

-Dual core Xtensa LX6 CPU.

- maximum clock speed up to 240 MHz.

Memory:

-Up to 520 KB SRAM.

-external PSRAM support up to 16MB.

Connectivity:

-Integrated Wi-Fi & Bluetooth.

GPS Support:

-No integrated GPS, but externally supports GPS modules through UART or SPI.

Communication Interfaces:

- SPI, I2C, I2S, UART,Ethernet.

Peripherals & Ports:

- 34 GPIOs, 12-bit ADCs (18 channels), DACs (2 channels), touch sensors.

Security:

- AES encryption, secure boot, flash encryption.

Power Efficiency:

-Ultra-low-power modes, ideal for battery-powered uses.

Programming:

-Coded via Arduino IDE, MicroPython.

Applications:

- Applied in IoT, smart home automation, robotics(Cameras,Drones), industrial control, and wearables(Smart watches)

Beagle Bone Board (Key features & Specifications):-

Core & Speed:

- ARM Cortex-A8 (1GHz) processor.

Memory:

- 512MB RAM, microSD card support.

Connectivity:

-No built-in Wi-Fi or Bluetooth.

GPS Support:

- No built-in GPS, but supports external GPS modules through UART, I2C, or SPI.

Communication Interfaces:

-SPI, I2C, I2S, UART, CAN, USB, Ethernet, HDMI, GPIOs.

Peripherals & Ports:

-2x PRU (Programmable Real-Time Units), 92 GPIOs, 12-bit ADC, PWM.

Security:

-Hardware acceleration of cryptography for secure programs.

Power Efficiency:

-Runs on 5V DC with low power.

Programming:

-Programmed using Linux, Ubuntu, Python, C/C++, Node.js.

Applications:

-Applied in IoT, AI, automation, and education.

NVIDIA Jetson Nano (Key features & Specifications):-

Core & Speed:  
-Quad-core ARM Cortex-A57 CPU with 1.43 GHz clock speed.  
  
Memory:  
-4GB LPDDR4 RAM.  
-MicroSD card (expandable up to 128GB).

Connectivity:  
-No Wi-Fi or Bluetooth integrated (supports through USB Wi-Fi).  
-Gigabit Ethernet for network.

GPS Support:  
-No inbuilt GPS ,but supports external GPS modules through USB, UART, or I2C.

Communication Interfaces:  
-SPI, I2C, UART, GPIO,and USB 3.0.  
-HDMI for display output.

Peripherals & Ports:  
-40 GPIO pins.  
-4 USB 3.0 ports, 1x HDMI 2.0.  
  
Power Efficiency:  
-Low power usage: 5V/4A input for low-power energy consumption in embedded applications.

Programming:  
Programmed through Python, C/C++, and TensorFlow.  
Compliant with Deep Learning, Computer Vision.

Applications:  
-AI & Machine Learning (Image Recognition, Object Detection).  
-Autonomous Robots, Drones, and Smart Cameras.  
-Edge Computing for real-time processing and IoT applications.

Intel Edison Board (Key features & Specifications):-

Core & Speed:  
-Dual-core Intel Atom CPU (500 MHz) + 32-bit Quark MCU (100 MHz).

Memory:  
- 4GB eMMC storage, and microSD card support.

Connectivity:  
-Integrated Wi-Fi and Bluetooth 4.0.  
-Supports USB OTG, UART, and Ethernet through adapter.

GPS Support:  
-No onboard GPS, but supports external GPS modules through UART, I2C, or SPI.

Communication Interfaces:  
-SPI, I2C, I2S, UART, USB 2.0 OTG, GPIOs, PWM.

Peripherals & Ports:  
-40 GPIO pins, 4 PWM outputs, 12-bit ADC.

Power Efficiency:  
-Low power consumption, runs on 3.3V–4.5V DC with power-saving modes.

Programming:  
-Programmed through Arduino IDE, Python.

Applications:  
-IoT & Wearable Devices (smart home, automation).  
-Robotics & Drones (edge computing & real-time control).  
-Medical & Industrial Automation (sensor-based monitoring).  
-AI & Smart Cameras (machine learning & vision processing).