Workshop Curriculum - Internet of Things

1-Day Workshop

Arduino / Node MCU

- Introduction to embedded system
- Introduction of Arduino and C Programming language
- Why Arduino?
- Scope and benefit of Arduino
- Overview of basic electronics and digital electronics.
- Microcontroller vs. Microprocessor
- Comparison between the two Different types of microcontrollers
- Introduction to Arduino
- Pin configuration and architecture
- Device and platform features
- Concept of digital and analog ports
- Pins Configured as INPUT
- Pins Configured as OUTPUT
- pinMode() Function
- digitalWrite() Function
- analogRead() function
- Arduino Interrupts
- Blinking of LEDs
- Fading of LED
- Circling of LEDs (FOR loop)
- Blinking of EVEN and ODD states of LEDs
- Introduction to Blynk Server
- Configuring Blynk server

Project : Lighting automation system

Workshop Curriculum - Artificial Intelligence

3-Day Workshop

Arduino Controller

DAY - 1

- What is AI?
- Purpose of AI?
- History of AI?
- Current status of AI?
- Future of AI?
- Applications of AI?
- Advantages & Disadvantages of AI
- Major AI Techniques
- Rules and logic-based approach
- Machine learning based approach
- What is Embedded system?
- Microprocessor
- Microcontroller
- Microprocessor vs Microcontroller
- Current status of Embedded system
- AI & Embedded system
- Arduino
- Basics of programming in Arduino
- IOT
- AI in IOT
- Conclusion

Project: IOT based real time environment monitoring system.

Workshop Curriculum - Artificial Intelligence

10-Day Workshop

Arduino Controller

DAY - 1

- What is AI?
- Purpose of AI?
- History of AI?
- Current status of AI?
- Future of AI?
- Applications of AI?
- Advantages & Disadvantages of AI
- Major AI Techniques
- Rules and logic-based approach
- Machine learning based approach
- What is Embedded system?
- Microprocessor
- Microcontroller
- Microprocessor vs Microcontroller
- Current status of Embedded system
- AI & Embedded system
- Arduino
- Basics of programming in Arduino
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- AI in IOT
- Conclusion

Project: IOT based real time environment monitoring system.

Sensors

DAY - 2

- Working with different sensors such as IR, PIR, LDR and Ultrasonic sensor.
- Serial programming
- Buzzer Interfacing

Project: Autonomous Rover
Voice Control Material handling robot
Smart Irrigation system

Raspberry pi & Python

DAY - 3

- What is Raspberry pi
- Arduino vs Raspberry pi
- Raspbian OS
- Configuration of memory card
- Overview of desktop and different software in pi
- Basic of programming in Python

Project: AI bases solar vehicle

Raspberry pi protocols

DAY - 4

- SSH Protocol
- Creating virtual screen on laptop or mobile of raspberry pi
- WIFI Module (ESP8266)

Project: Wall follower bot with artificial eyes

Camera

DAY - 5

- Camera interfacing in Raspberry pi
- Basics commands to access camera
- Image processing
- Types of images
- Conversion of images into different format

Project: Real Time Face detection
Material Dimensioning robot
Pick and place robot

IoT

DAY - 6

- Concept of IOT
- Interfacing Raspberry pi with web server
- Relay board

Project: Web controlled home automation using IOT.

Completion of projects

DAY - 7-8

Assessment & Certification- Day 9 & 10

Raspberry Pi

DAY - 2

- Description of Raspberry Pi
- Installation of Operating System
- Python Programming
- LED Blinking
- Integrating Sensors with Pi
- Concept of IOT
- Interfacing Raspberry pi with web server
- Relay board

Project: Web controlled home automation using IOT.

Camera

DAY - 3

- Camera interfacing in Raspberry pi
- Basics commands to access camera
- Image processing
- Types of images
- Conversion of images into different format

Project: Real Time Face detection