Shetty Institute of Technology
Kalaburagi

Department of
Computer Science & Engineering

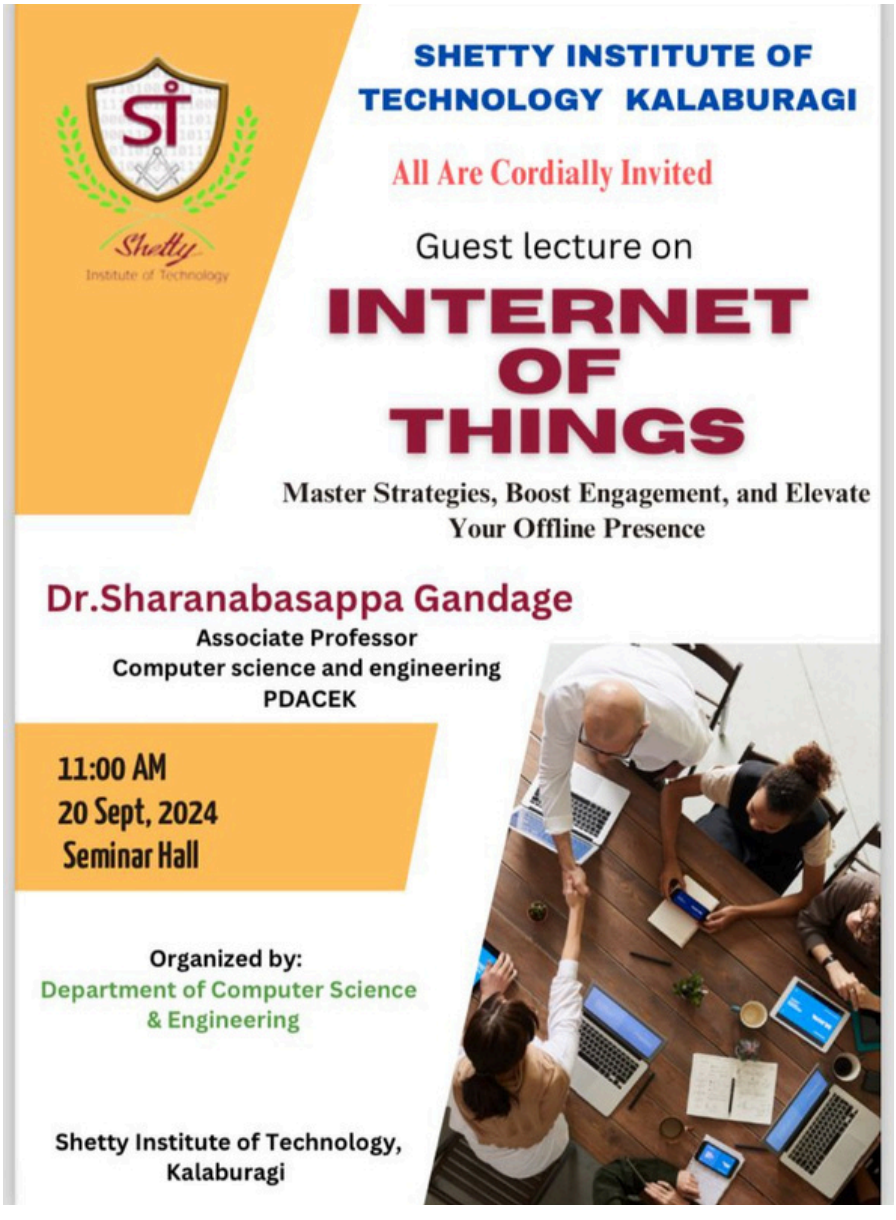
VISSION :

To lead in advancing computer science education, preparing students with cutting-edge knowledge and skills that meet global standards and address future challenges.

MISSION :

1. Support overall student growth through hands on and innovative learing approaches.
2. Create a dynamic environment that encourages creativity and analytical thinking.
3. Promote social responsibility and ethical leadership qualities among our students.

GUEST LECTURE ON IOT



OBJECTIVE:

1. Understand about the fundamentals of Internet of Things and its building blocks along with their characteristics.

2. Understand the recent application domains of IoT in everyday life.

3. Understand the protocols and standards designed for IoT and the current research on it

4. Improve their knowledge about the various cutting-edge technologies in the field IoT and machine learning applications

5. Gain insights about the current trends of machine learning and AI techniques used in IoT to orient towards the present industrial scenario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The Evolution of IoT

The Internet of Things (IoT) is a rapidly evolving landscape where physical devices, vehicles, buildings, and other objects are equipped with sensors, actuators, and software to collect and exchange data. It represents a fusion of the physical and digital worlds, enabling seamless communication and interaction between humans and machines.

IoT and the Digital Transformation Landscape

1 Transformative Power

The IoT revolution is transforming industries, businesses, and society as a whole, driving significant efficiency gains, enhanced customer experiences, and new business models.

2 Data-Driven Insights

IoT devices generate vast amounts of data, offering unprecedented insights into operations, consumer behavior, and environmental conditions, enabling data-driven decision making.

3 Smart Automation

The interconnected nature of IoT devices allows for intelligent automation of processes, improving efficiency, reducing costs, and minimizing human error.

4 Connectivity and Communication

IoT networks enable seamless communication between devices, enabling real-time monitoring, control, and coordination of various physical systems.


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Data and Analytics for IoT

This course introduces you to the world of data analytics in the context of the Internet of Things (IoT), exploring how data is collected, processed, and analyzed to gain insights and drive innovation.

Network Analytics and Securing IoT Devices

Learn about network analytics techniques used to monitor and analyze IoT network traffic, identifying security threats and vulnerabilities, and implementing measures to protect sensitive data and devices.

Network Monitoring	Real-time tracking and analysis of network traffic to detect anomalies and potential threats.
Security Threat Detection	Identifying and responding to malicious activities, including unauthorized access, data breaches, and denial-of-service attacks.
Vulnerability Assessment	Identifying and mitigating weaknesses in IoT devices, networks, and software to prevent exploitation by attackers.


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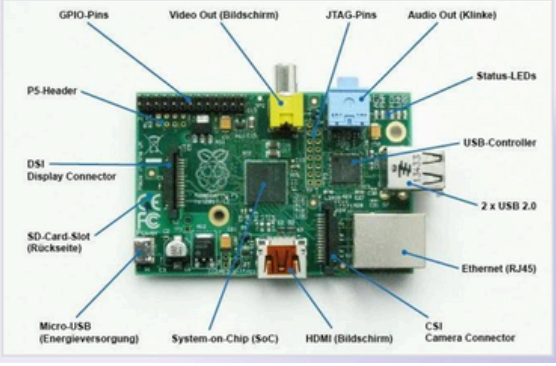
Raspberry Pi: A Beginner's Guide

This guide introduces the exciting world of Raspberry Pi, a credit-card sized computer with endless possibilities. Learn about the hardware, software, and programming capabilities of this versatile device.



Processor

A quad-core processor with speeds up to 1.5GHz, providing ample power for various tasks.

Memory

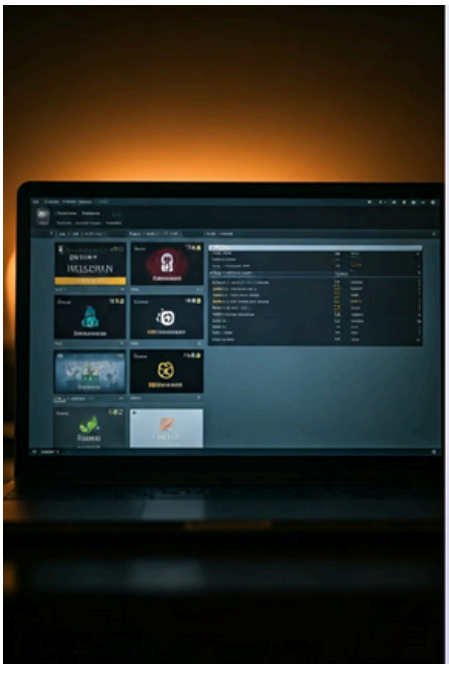
Available in various RAM configurations, from 1GB to 8GB, to handle different workloads.

Connectivity

Featuring Ethernet, Wi-Fi, and Bluetooth for seamless network connectivity.

GPIO Pins

General Purpose Input/Output pins allow for interaction with external hardware and sensors.



Operating Systems on Raspberry Pi

The Raspberry Pi supports various operating systems, each with its own features and strengths. Users can choose the most suitable OS for their projects.

1 **Raspbian**

The official OS for Raspberry Pi, optimized for performance and resource management.

2 **Ubuntu**

A popular Linux distribution known for its wide software support and community.

3 **Fedora**

A cutting-edge Linux distribution focused on innovation and new technologies.

Programming Raspberry Pi with Python

Python is a popular programming language for Raspberry Pi due to its simplicity, readability, and extensive libraries.

1 **Installation**

Python is pre-installed on most Raspberry Pi operating systems.

2 **Basic Programs**

Start with simple programs to understand the basics of Python syntax and commands.

3 **Advanced Projects**

Explore more complex projects involving sensors, actuators, and other hardware components.

Storing Data into a Remote Data Server

The collected temperature data can be stored on a remote data server, enabling data analysis, visualization, and long-term monitoring.

Data Storage

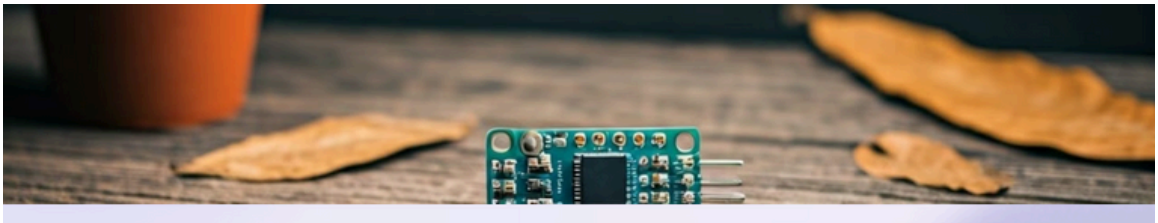
The data server provides a secure and reliable platform for storing large amounts of data.

Cloud Connectivity

The Raspberry Pi can connect to the data server through a cloud-based service.

Data Analysis

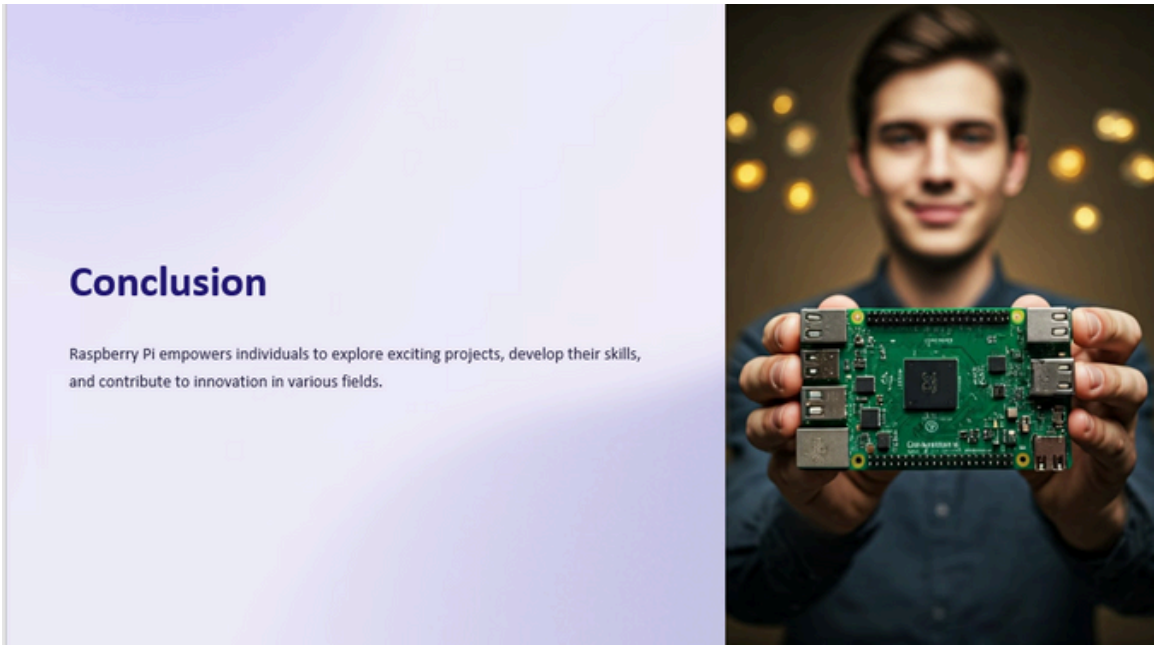
Stored data can be analyzed to identify trends, patterns, and insights.



DS18B20 Temperature Sensor

The DS18B20 is a highly versatile temperature sensor that offers precise readings and compatibility with Raspberry Pi.

Feature	Description
Measurement Range	-55°C to +125°C
Accuracy	±0.5°C
Resolution	0.0625°C
Communication Protocol	1-Wire



Outcome

1. Understand the evolution of IoT, IoT networking components, and addressing strategies in IoT.

2. Analyze various sensing devices and actuator types.

3. Demonstrate the processing in IoT.

4. Apply different connectivity technologies

5. Understand the communication technologies , protocols and interoperability in IoT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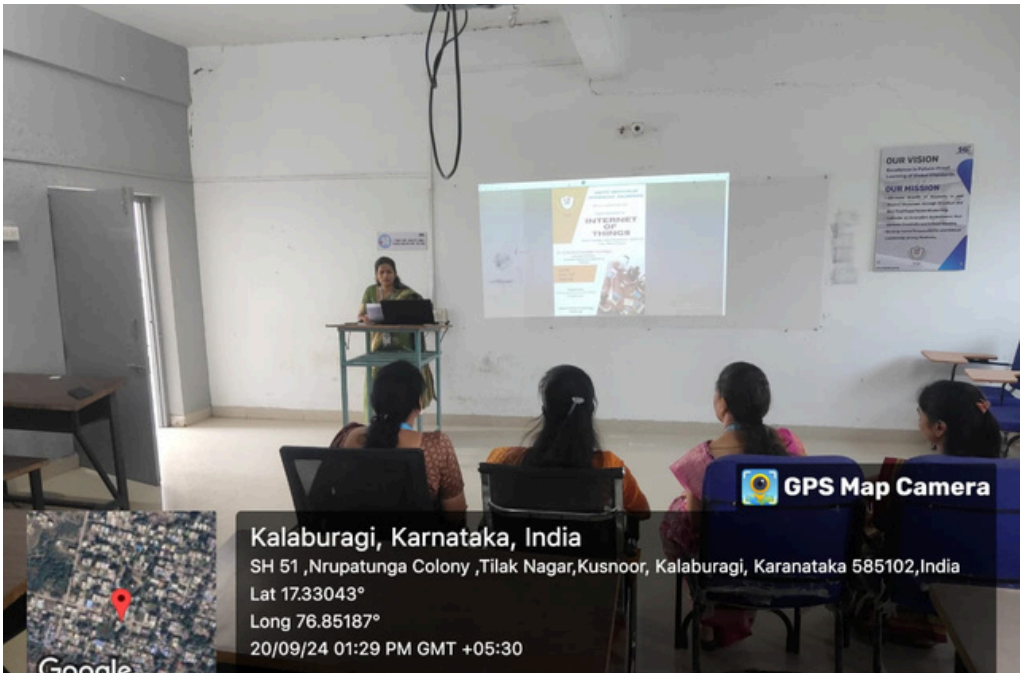
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