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REPORT ON

Hands on Training on Introduction to Embedded Systems

IEEE
BANGALORE SECTION

Organized by IEEE Student Branch & SS Technologies

Topic: Hands on Training on Introduction to Embedded Systems

Date of event: 8-7-2023 to 9-7-2023

Venue: Aryabhatta Seminar Hall, Dept of ECE, KSSEM

Number of participants: 62

Targeted Audience: 2nd year ECE students

Event Coordinator: Mrs Jayashree G R & Mrs Bhargavi V S, Assistant Professor, Dept of ECE, KSSEM

The IEEE Student branch in association with the ECE department, of KSSEM, had organized a Hands on training on "**Introduction to Embedded Systems**" from 8-7-2023 to 9-7-2023 at 9:00am IST.

The Hands on Training was conducted at K.S School of Engineering & Management, Bangalore. The training was given by Mr Rahul Kumar A and Mr Bharath Gowda P S, Founder and Engineer, Inversa Technosoft. Dr.K Senthil Babu, HoD of ECE, graced the event with their presence. The Hands on training was attended by both faculty members and students.

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Topics Covered:

The training covered various aspects of interfacing. Some of the topics discussed were:

- Blinking of LED
- RGB LED
- IR Sensors
- LDR Sensor
- Raindrop Sensor
- Motor Driver
- Line Follower Robot

Blinking of LED

A light-emitting diode (LED) is a semiconductor device that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of the semiconductor. White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device.

RGB LED

The working of RGB LED is it has four terminals, in which three colors red, green, blue, and one more terminal represent anode or cathode depending on its type. The emission of various colors using this LED can be achieved by changing or setting the intensity levels of internal LED's (red LED, the green LED, blue LED) and combining these colored outputs to display different colored outputs.

IR Sensors

IR sensor is an electronic device, that emits the light in order to sense some object of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation.

LDR Sensor

An LDR or light dependent resistor is also known as photo resistor, photocell, and photoconductor. It is a one type of resistor whose resistance varies depending on the amount of light falling on its surface. When the light falls on the resistor, then the resistance changes. These resistors are often used in many circuits where it is required to sense the presence of light. These resistors have a

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Variety of functions and resistance. For instance, when the LDR is in darkness, then it can be used to turn ON a light or to turn OFF a light when it is in the light. A typical light dependent resistor has a resistance in the darkness of 1MOhm, and in the brightness a resistance of a couple of K Ohm

Raindrop Sensor

Raindrop Sensor is a tool used for sensing rain. It consists of two modules, a rain board that detects the rain and a control module, which compares the analog value, and converts it to a digital value. The raindrop sensors can be used in the automobile sector to control the windshield wipers automatically, in the agriculture sector to sense rain and it is also used in home automation systems.

Motor Driver

A motor driver IC is an integrated circuit chip that controls motors in autonomous robots and embedded circuits. L293D and ULN2003 are the most commonly used motor Driver IC that is used in simple robots and RC cars.

Line Follower Robot

Line Follower Robot (LFR) is a simple autonomously guided robot that follows a line drawn on the ground to either detect a dark line on a white surface or a white line on a dark.

Infrared sensors consist of two elements, a transmitter and a receiver. The transmitter is basically an IR LED, which produces the signal and the IR receiver is a photodiode, which senses the signal produced by the transmitter. The IR sensors emits the infrared light on an object, the light hitting the black part gets absorbed thus giving a low output but the light hitting the white part reflects back to the transmitter which is then detected by the infrared receiver, thereby giving an analog output. Using the stated principle, we control the movement of the robot by driving the wheels attached to the motors, the motors are controlled by a microcontroller.

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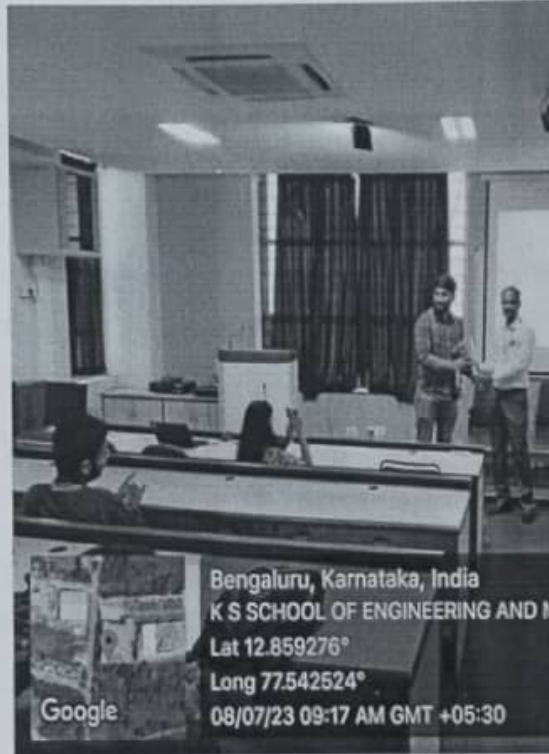**KSSEM** DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Fig 1. Inauguration of Hands on training on Introduction to Embedded Systems

Fig 2. Students Interfacing Line Follower Robot and Blinking LED

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Fig 3. Guest Speaker, Faculties and Students present in the Event

Coordinator

Mrs Jayashree G R

Mrs Bhargavi Vijendra Sangam

Signature of HoD, ECE
Professor & Head
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