



**G H PATEL COLLEGE OF ENGINEERING &
TECHNOLOGY,
Vallabh Vidyanagar
(A Constituent College of CVM University)**



WEBINAR SERIES 2.0

CVM University, G H Patel College of Engineering & Technology, Electronics & Communication Engineering Department organised Webinars Series on Skill Development #2.0, INSTITUTE TO INDUSTRY LINKAGE, with support from SSIP Cell.

Session details with screenshots are as follows:

The banner features a central image of a man, Ravi Kiran Bolla, in a suit, set against a background of a glowing blue network diagram. The text on the banner includes:

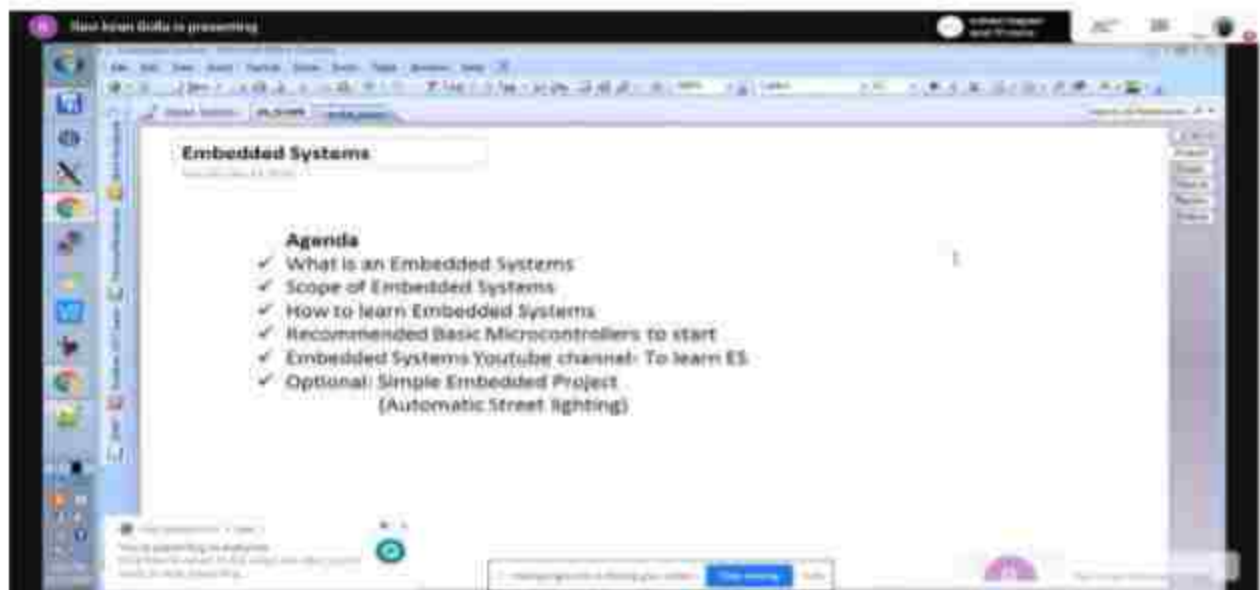
- GCET** (top left)
- CVM UNIVERSITY** (top right)
- WEBINAR SERIES ON SKILL DEVELOPMENT #2.0** (top center)
- INSTITUTE TO INDUSTRY LINKAGE** (top center)
- 23RD MAY 2020** (on a green screen)
- 6:00 PM** (on a green screen)
- TALK ON** (on a green screen)
- SCOPE OF EMBEDDED SYSTEM UNDER** (on a green screen)
- MAHINDRA & MAHINDRA** (bottom left)
- ORGANIZED BY** (bottom center)
- DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING** (bottom center)
- G H PATEL COLLEGE OF ENGINEERING AND TECHNOLOGY** (bottom center)



GCET **WEBINAR SERIES ON SKILL DEVELOPMENT #2.0 FROM INSTITUTE TO INDUSTRY** **CVM**

Dr. Ravi Kiran Bolla

- > M.Tech-Embedded Systems, Embedded Software Engineer,
- > Total 7+ years of experience in embedded software design and development
- > Currently working as a Deputy Manager(Embedded Software development) @ M&M
- > Previously Worked as a Senior Software Engineer at Robert Bosch.

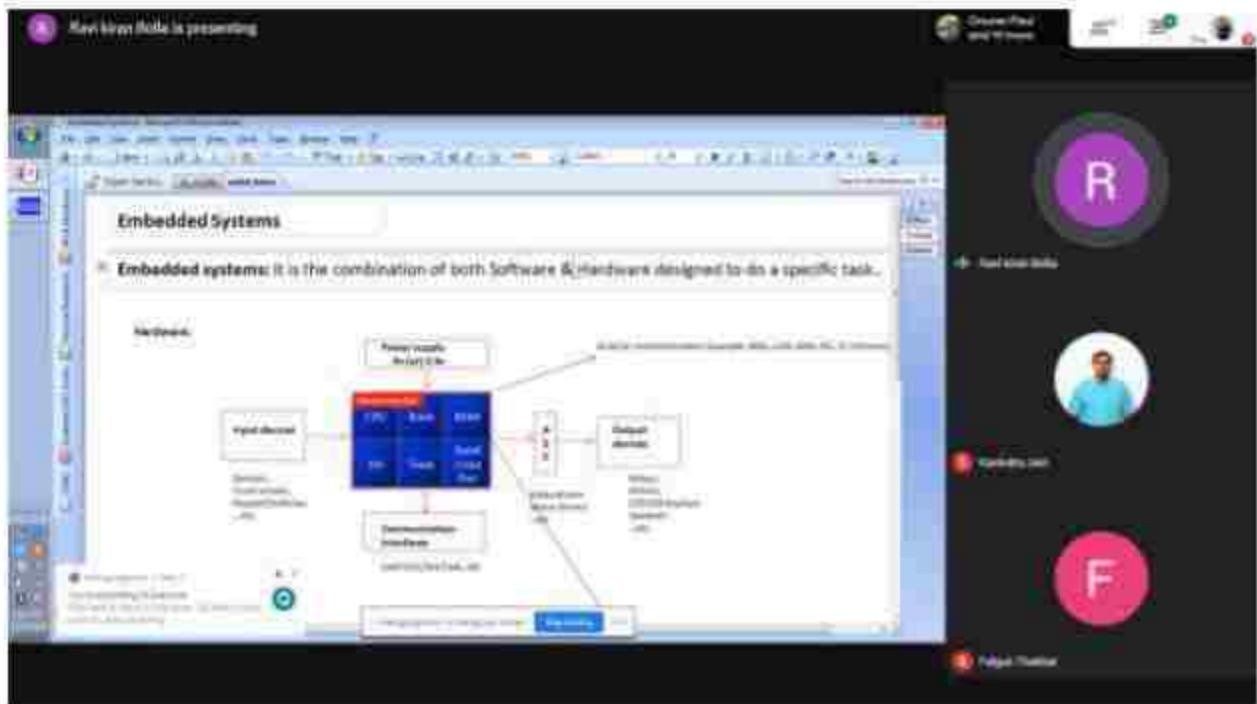


Dr. Ravi Kiran Bolla is presenting

Embedded Systems

Agenda

- ✓ What is an Embedded Systems
- ✓ Scope of Embedded Systems
- ✓ How to learn Embedded Systems
- ✓ Recommended Basic Microcontrollers to start
- ✓ Embedded Systems Youtube channel: To learn ES
- ✓ Optional: Simple Embedded Project (Automatic Street lighting)



Next Karan Datta is presenting

Embedded Systems

Embedded systems: It is the combination of both Software & hardware designed to do a specific task.

Hardware:

- Input/Output
- Memory (RAM, ROM)
- Processor (CPU, GPU)
- Storage (SSD, HDD)
- Power Supply (Battery, AC)
- Communication (Wi-Fi, Bluetooth)

Software:

- Operating System (OS)
- Application Software

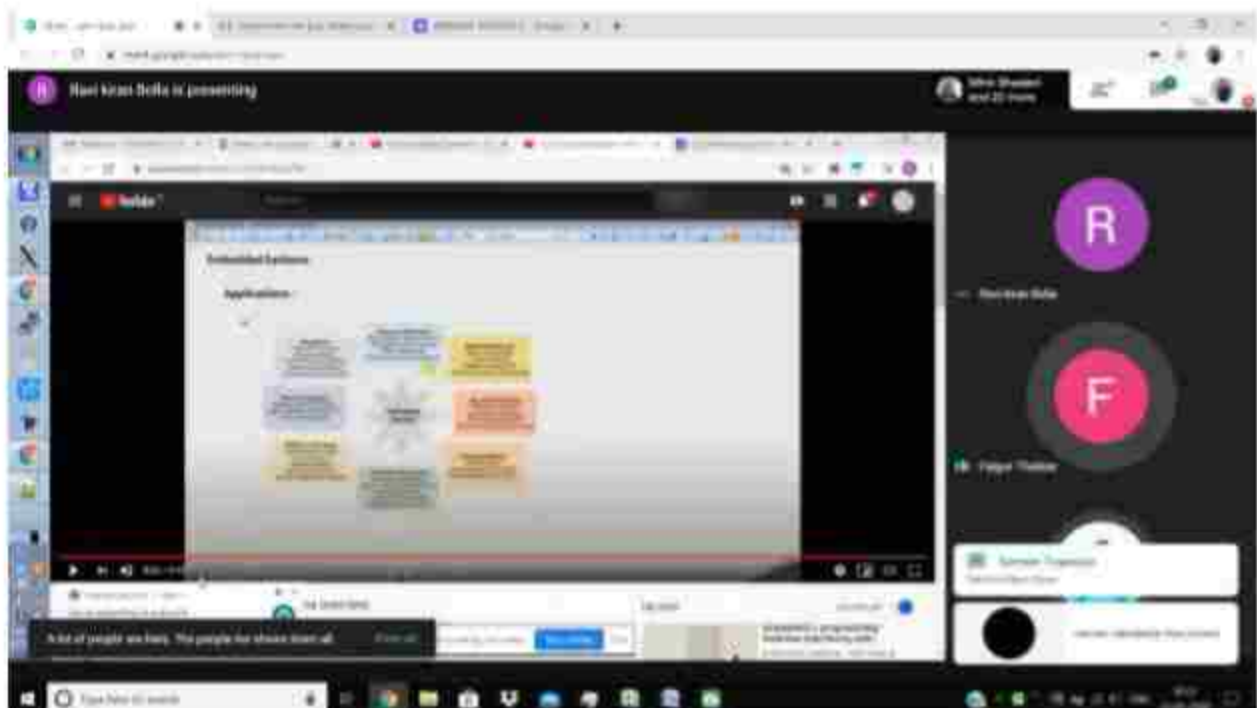
Integration:

- Integration of Hardware & Software

Applications:

- Industrial Automation
- Consumer Electronics
- Automotive Systems
- Medical Devices
- Aerospace Systems
- Defense Systems
- Smart Infrastructure

Participants: Karan Datta, Karan Datta, Fajar Thohir



Next Karan Datta is presenting

Embedded Systems

Applications:

- Industrial Automation
- Consumer Electronics
- Automotive Systems
- Medical Devices
- Aerospace Systems
- Defense Systems
- Smart Infrastructure

Participants: Karan Datta, Fajar Thohir

Navin Arora (Balla) is presenting

Share Your Screen

Scope of Embedded Systems

- ✓ Career in Embedded
- ✓ Job openings
- ✓ Learning ES easy?
- ✓ Future of ES
- ✓ Salaries/ Packages in ES
- ✓ Job security
- ✓ Advance topics in ES
- ✓ Career Paths in ES
- ✓ Different sectors

Career Paths in ES

H. EMBEDDED | EMBEDDED

Development & testing | Development & testing

Navigation icons: Home, Back, Forward, Stop, Refresh, Full Screen, Close

Participants: R, F

Current Presenter: Navin Arora (Balla)

Navin Arora (Balla) is presenting

Share Your Screen

Scope of Embedded Systems

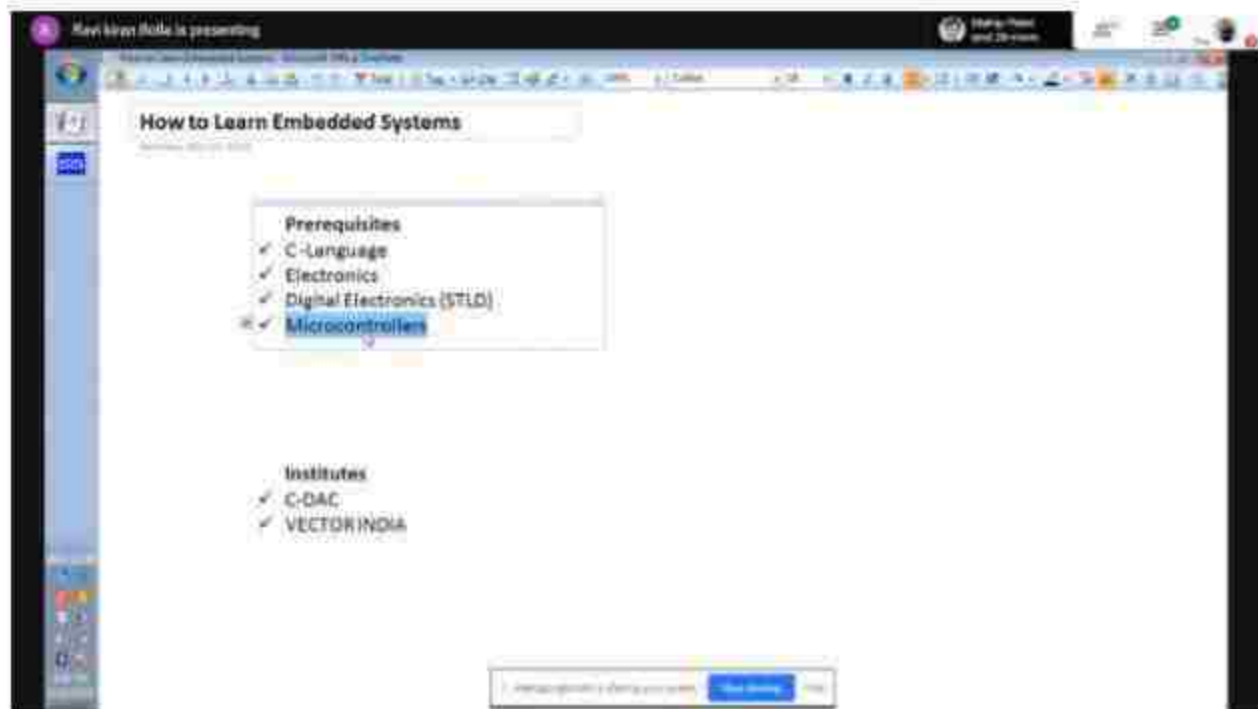
- ✓ Career in Embedded
- ✓ Job openings
- ✓ Learning ES easy?
- ✓ Future of ES
- ✓ Salaries/ Packages in ES
- ✓ Job security
- ✓ **Advance topics in ES**
- ✓ Career Paths in ES
- ✓ Different sectors

Career Paths in ES

Job title | Job title

Development & testing | Development & testing

Navigation icons: Home, Back, Forward, Stop, Refresh, Full Screen, Close



How to Learn Embedded Systems

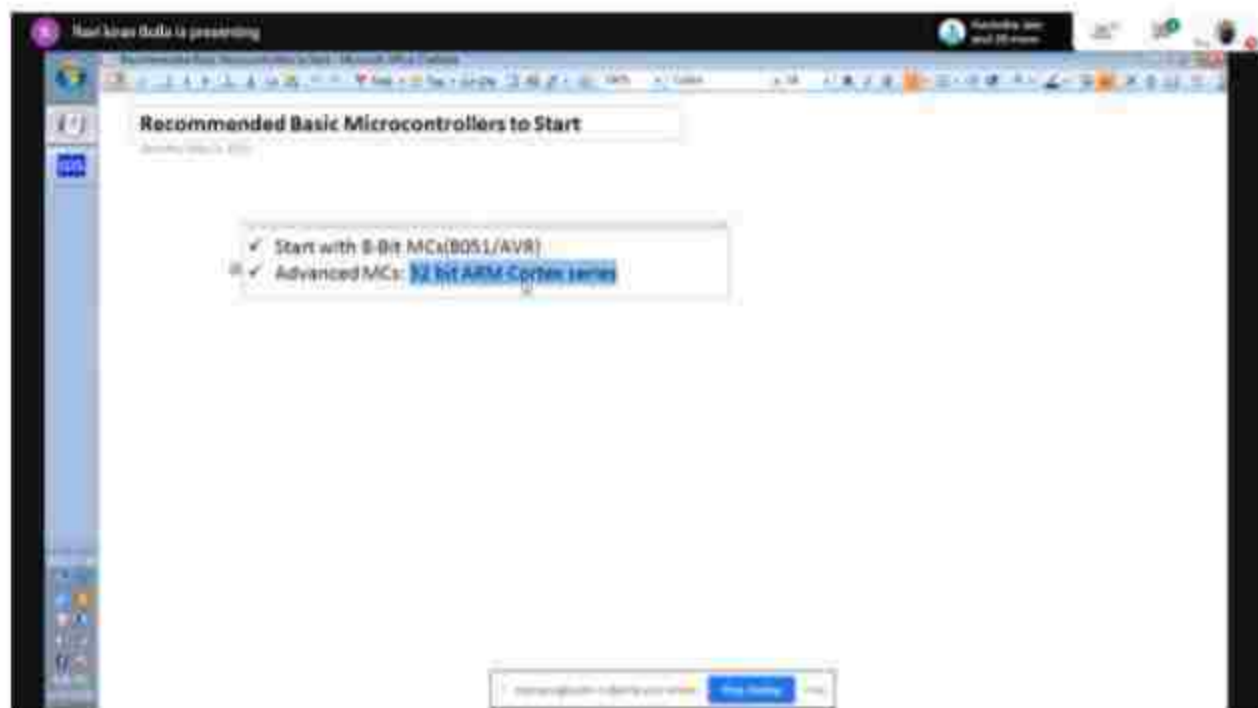
Prerequisites

- ✓ C-Language
- ✓ Electronics
- ✓ Digital Electronics (STLD)
- ✓ **Microcontrollers**

Institutes

- ✓ C-DAC
- ✓ VECTOR INDIA

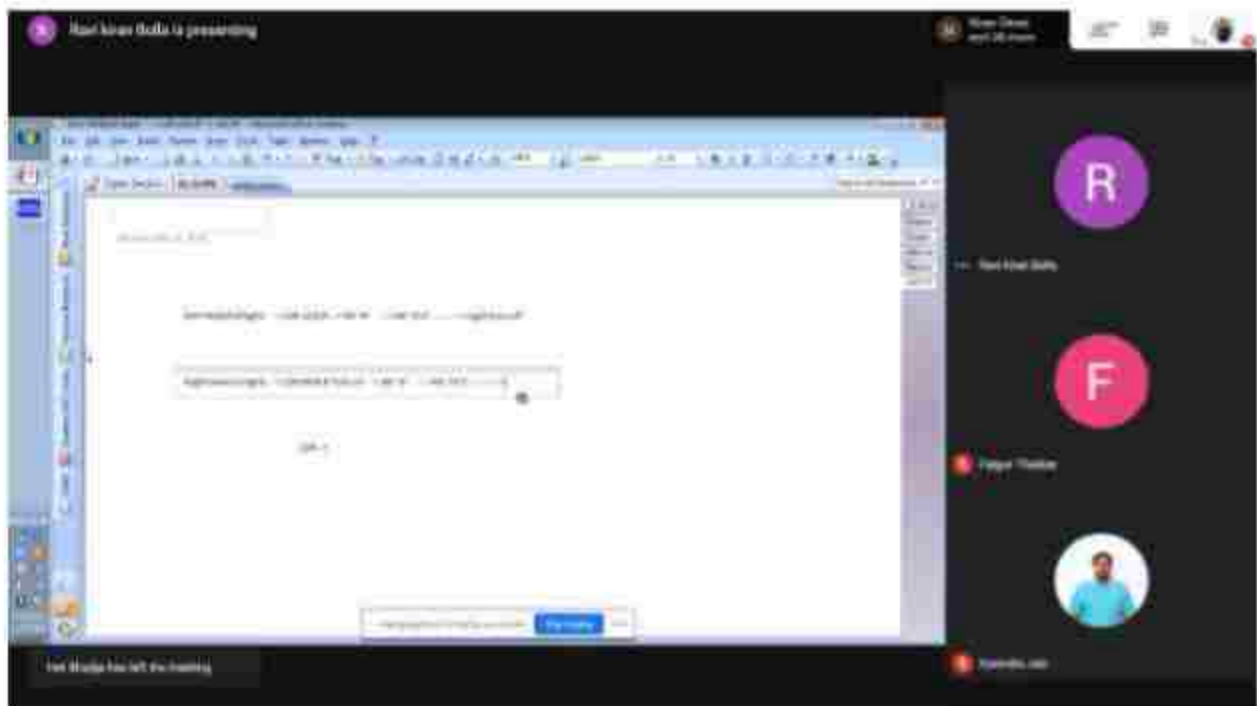
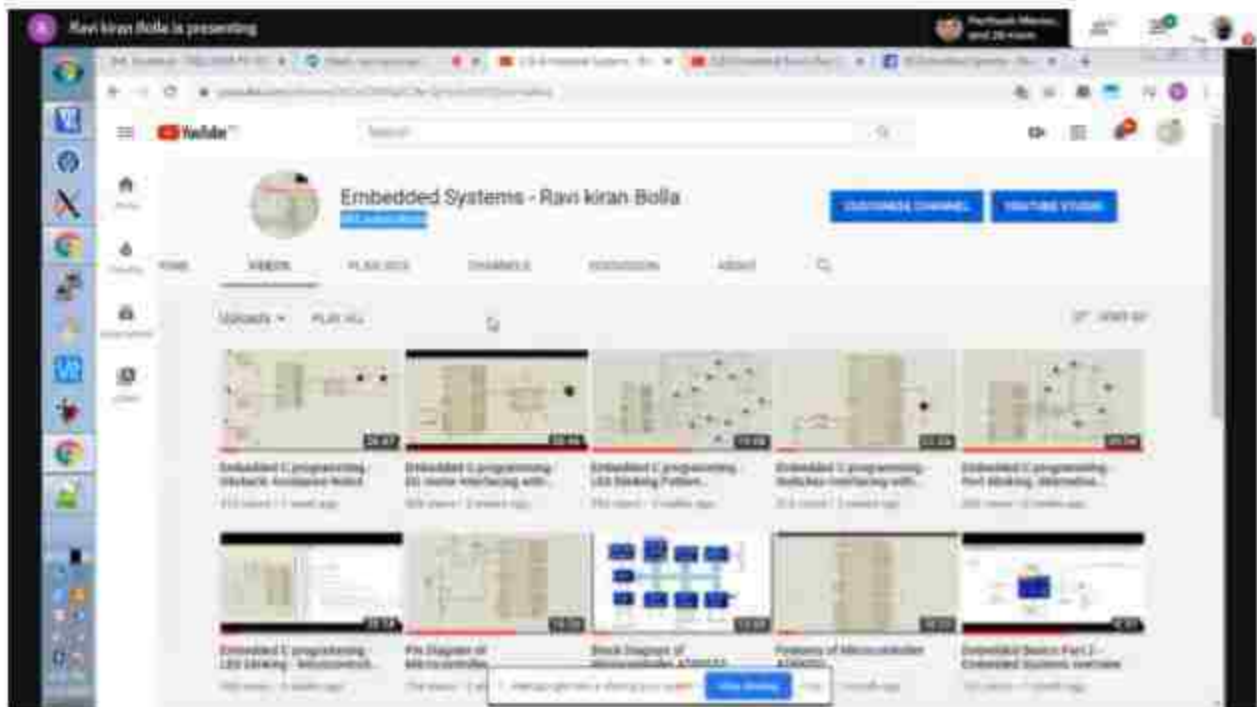
Navigation buttons: Home, Back, Forward, Stop, Refresh, Search, Print, Close

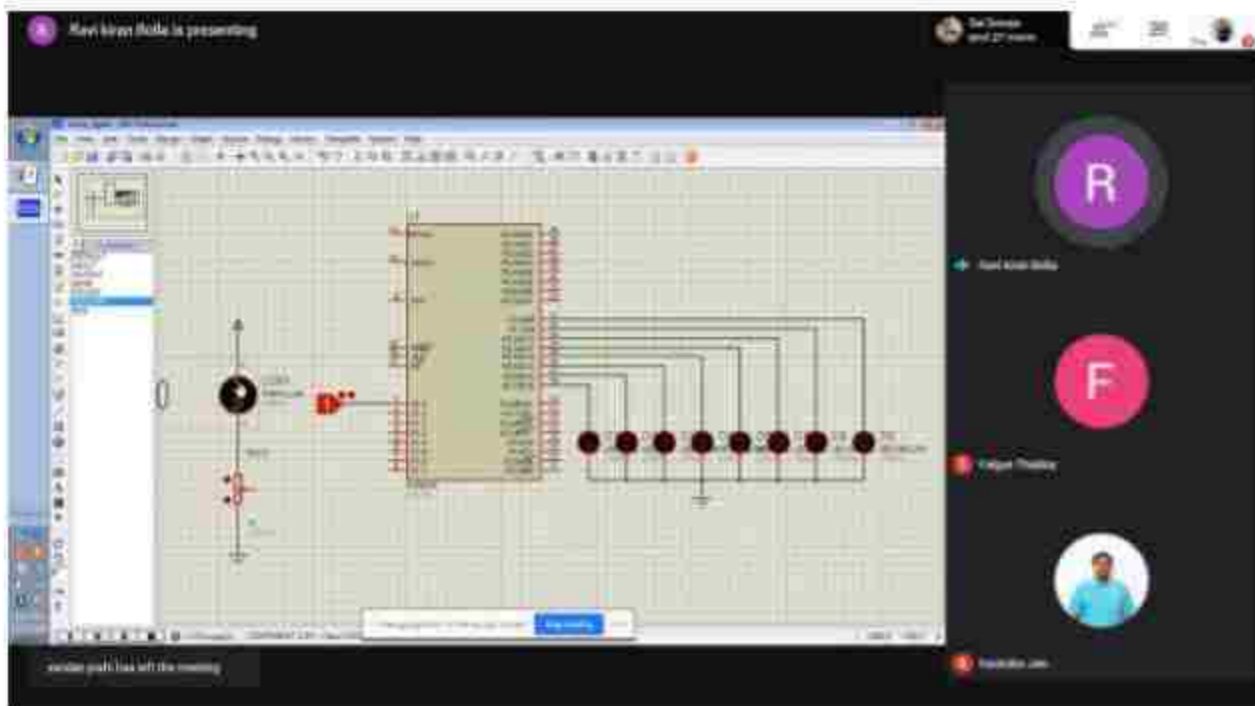


Recommended Basic Microcontrollers to Start

- ✓ Start with 8-Bit MCs (8051/AVR)
- ✓ Advanced MCs: **32 bit ARM-Cortex series**

Navigation buttons: Home, Back, Forward, Stop, Refresh, Search, Print, Close

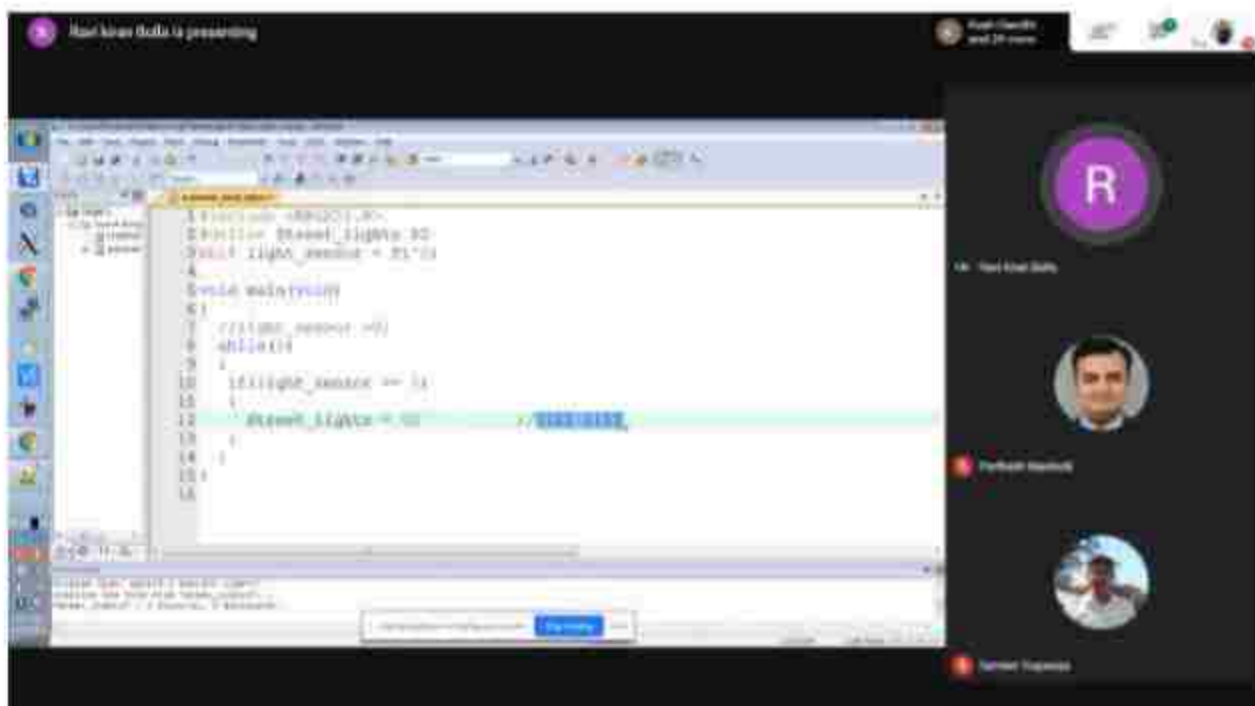




Next View Slide is presenting

The circuit diagram in Proteus shows a microcontroller (likely an 8051) connected to a sensor module. The sensor module includes a black circular sensor and several LEDs. The microcontroller's pins are connected to the sensor's pins and the LEDs. The software interface includes a toolbar on the left and a command window at the bottom.

Participants: R, F, and a profile picture.

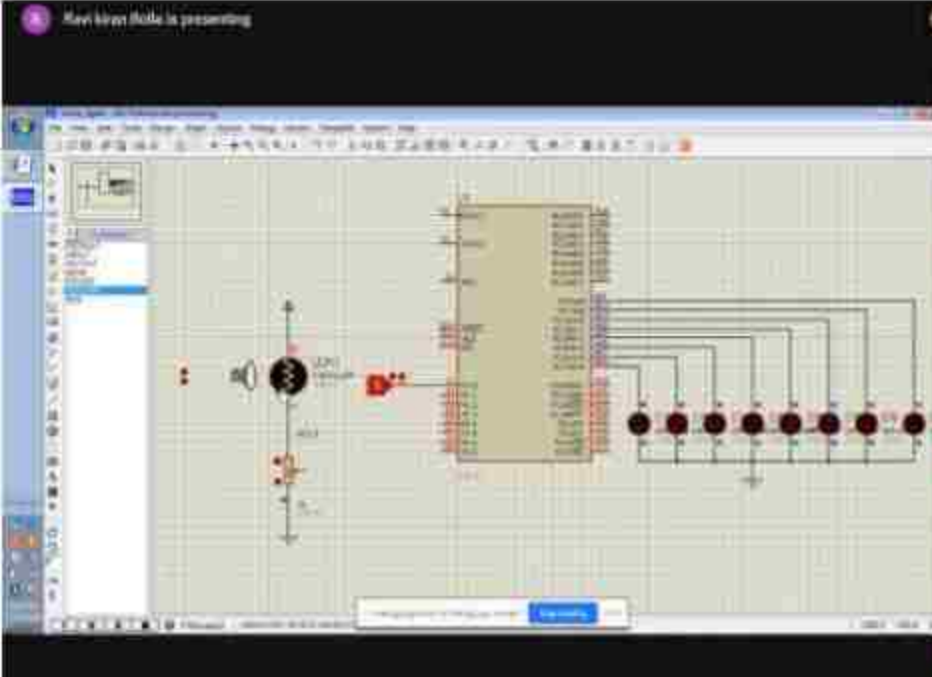


Next View Slide is presenting

```
1 #include <8051.h>  
2 #include <delay.h>  
3 #define LIGHT_SENSOR = 21  
4  
5 void main(void)  
6 {  
7     while(1)  
8     {  
9         if(LIGHT_SENSOR == 1)  
10            delay_ms(100);  
11            delay_ms(100);  
12            delay_ms(100);  
13        }  
14    }  
15  
16
```

Participants: R, a profile picture, and another profile picture.

Next View Slide is presenting



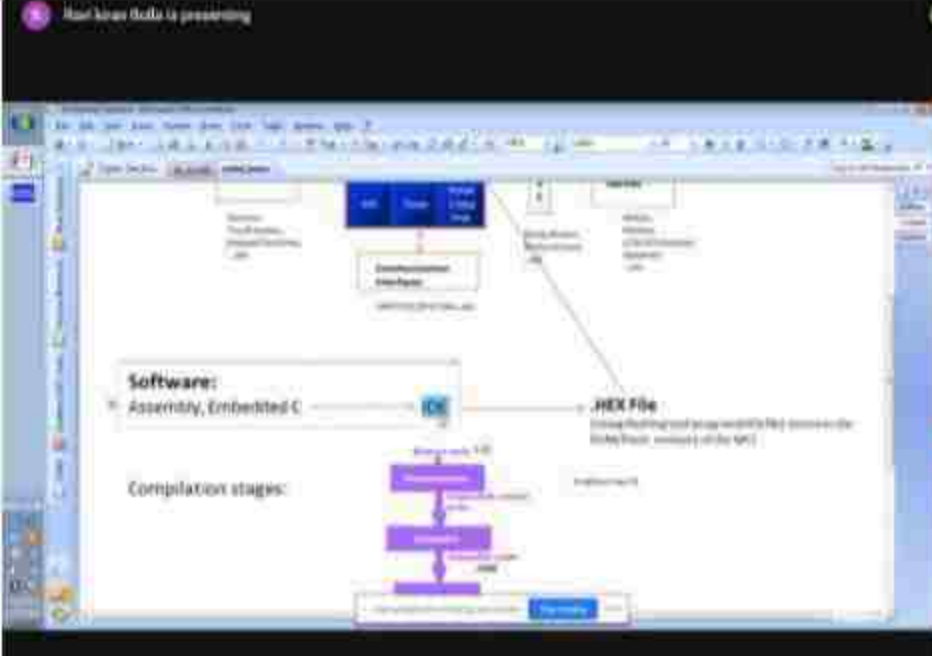
Next View Slide is presenting

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Next View Slide is presenting



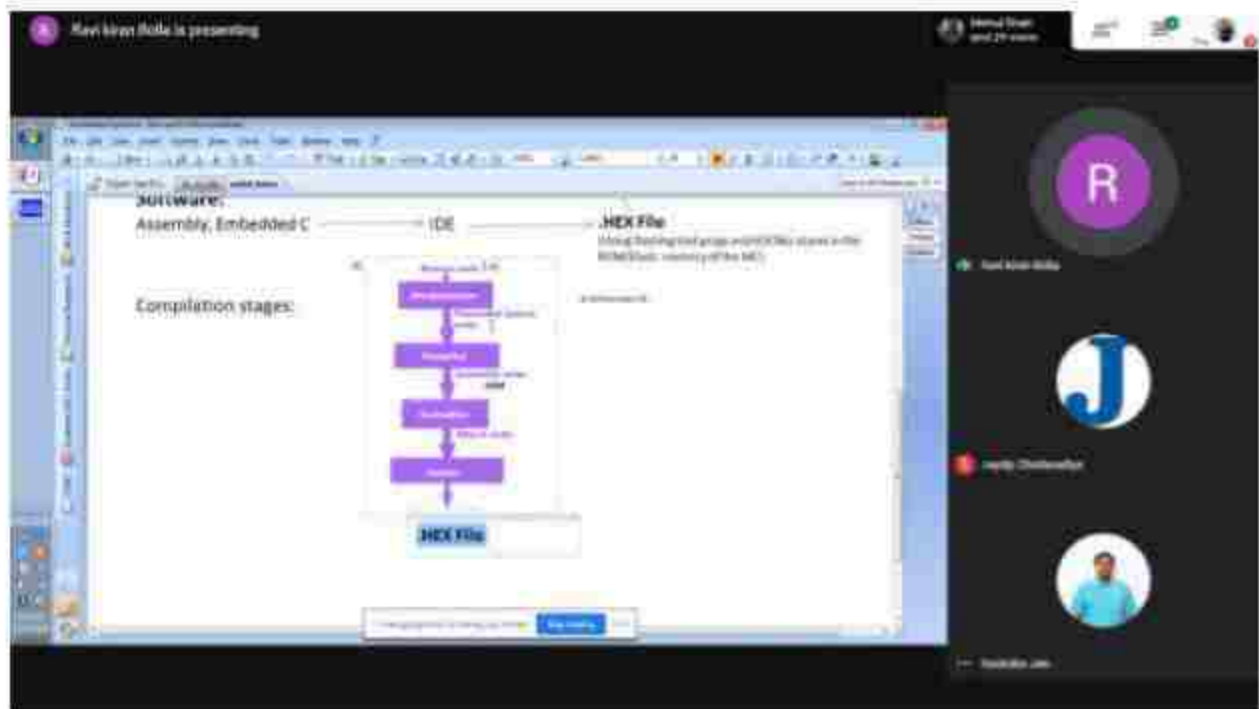
Next View Slide is presenting

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Next View Slide

Next View (You're presenting) Shared Screen and 29 more

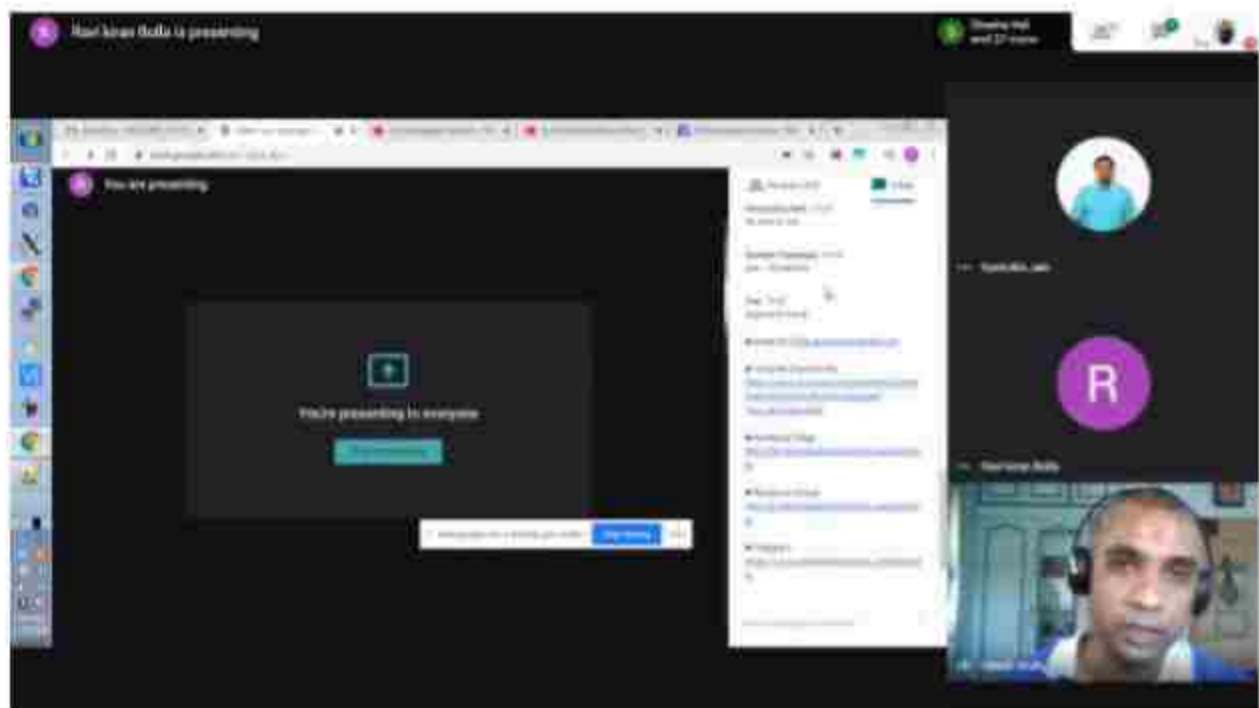


The slide content includes:

- SOFTWARE:** Assembly, Embedded C
- IDE**
- .HEX File:** (Most) Everything that goes into a HEX file starts in the IDE (IDEs: memory of the IDE)
- Compilation stages:**
 - Preprocessor
 - Compiler
 - Assembler
 - Linker
- HEX FILE**

The right sidebar shows a list of participants with profile pictures: 'R', 'J', 'Rishabh Choudhary', and 'Shashank Jain'.

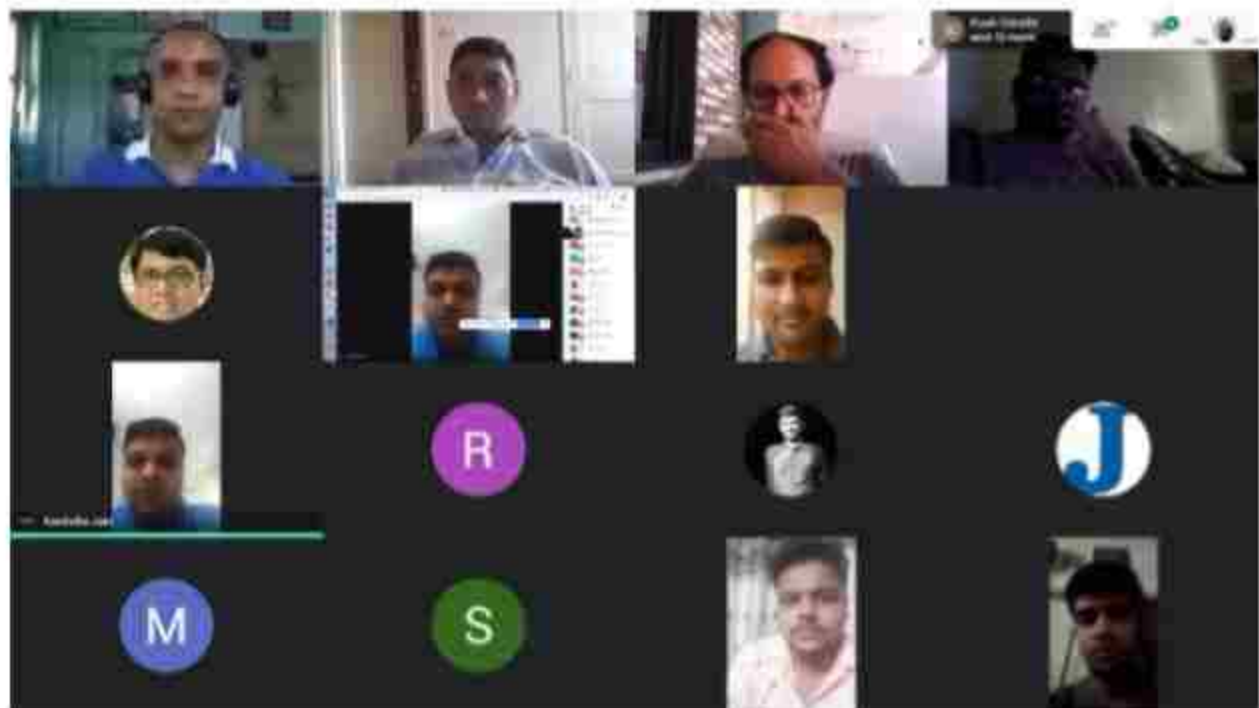
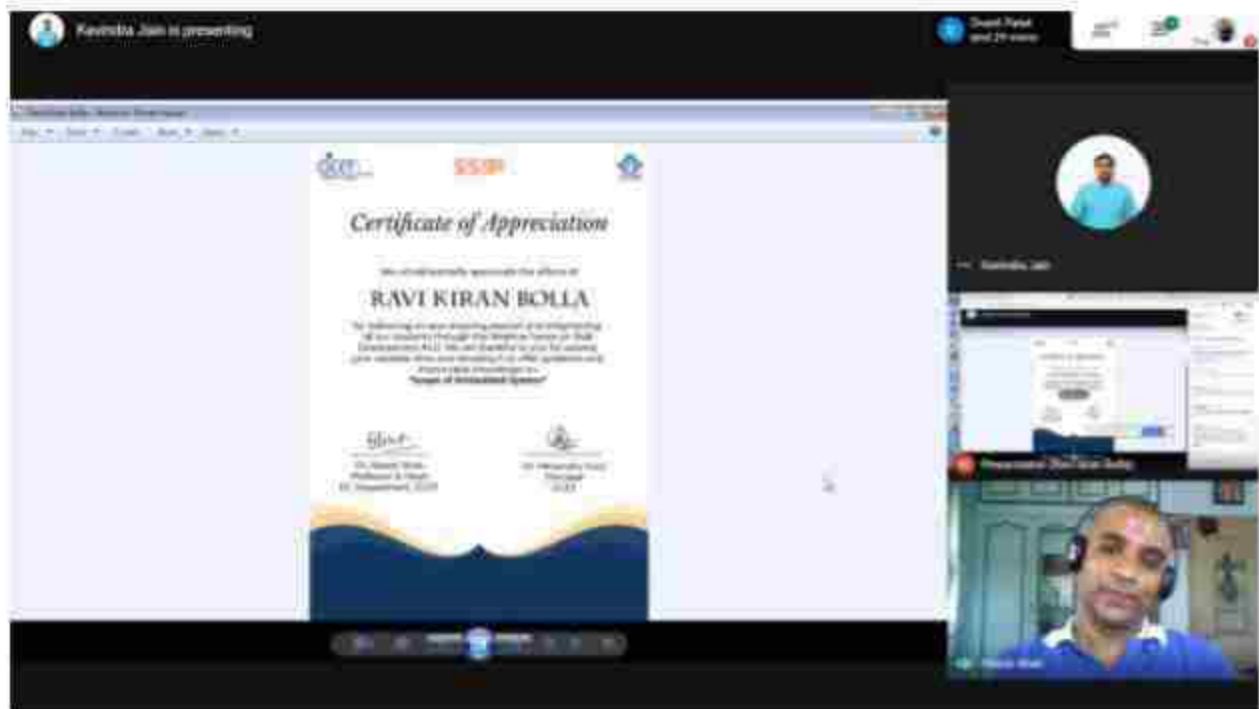
Next View (You're presenting) Sharing Myself and 27 more

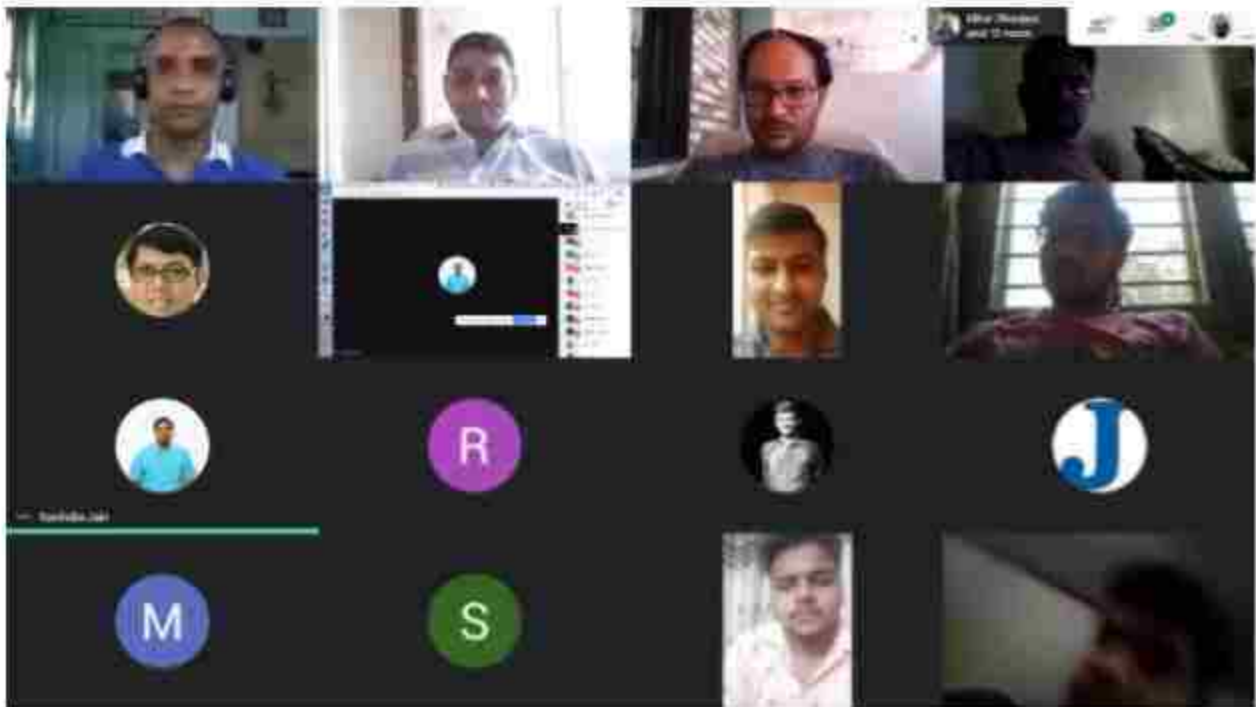


The slide content includes:

- You're presenting**
- You're presenting to everyone**
- Share Screen**

The right sidebar shows a list of participants: 'Shashank Jain', 'R', and 'Rishabh Choudhary'. A video feed of a man wearing a headset is visible at the bottom right of the sidebar.





Registered student details

SEMESTER	FIRST NAME	LAST NAME
SEM 4	FALDU	VASU
SEM 4	Akshay	Bhatt
SEM 4	PARTH	KALARIYA
SEM 4	Anupam	Kanungo
SEM 2	Bhruvu	Dave
SEM 4	Het	Bhadja
SEM 4	Mihir	Barpande
SEM 4	Kaushal	Cholera
SEM 4	Kalval	Prajapati
SEM 4	Tanvi	Bhankhar
SEM 4	Rajesh	Nakum
SEM 4	Piyush	Gupta
SEM 2	Himanshu	Patil
SEM 4	Mihir	Bhadani
SEM 4	Dweejal	Shah

SEM 4	Meet	Bhandari
SEM 4	Kapuriya	brijesh
SEM 4	Kishan	Timbadiya
SEM 4	Mit	Patel
SEM 4	Bhavin	Makwana
SEM 2	Gourav	Paul
SEM 4	Jay	Raniga
SEM 2	Vraj	Patel
SEM 4	Kalp	Sheth
SEM 4	Jay	Isamaliya
SEM 4	Rutvik	Bodar
SEM 4	Ajaysinh	Jadeja
SEM 2	Dharmik	Vanani
SEM 4	Rushabh	Mehta
SEM 4	Achyut	Sapariya
SEM 4	Siddhanth	Pai
SEM 4	Mit	Patel
SEM 2	Kush	Gandhi
SEM 4	Giriraj	Shah
SEM 4	Valbhav	Sanghavi
SEM 4	Riya	pandya
SEM 4	Nandani	Patel
SEM 4	Deep	Vekariya
SEM 4	Drasti	Domadiya
SEM 2	Tirth	Makadia
SEM 4	Smeat	Shah
	Satyamkumar	Lodhiya
	Jaydeep	Chodavadiya
	Shubham	Sharma



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**WEBINAR SERIES ON SKILL DEVELOPMENT #2.0
FROM
INSTITUTE TO INDUSTRY**

SSIP

10:00 AM
30TH MAY 2020
Programmable Logic Controllers & Applications

**BHARATKUMAR ARAMBHADYA
SCIENTIFIC OFFICER
EI DIVISION
INSTITUTE FOR PLASMA RESEARCH**

ORGANISED BY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
G. H. PATEL COLLEGE OF ENGINEERING & TECHNOLOGY



Zoom Meeting by presenting

Zoom Meeting
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G. H. PATEL COLLEGE OF ENGINEERING & TECHNOLOGY

**WEBINAR SERIES ON SKILL DEVELOPMENT #2.0
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G. H. PATEL COLLEGE OF ENGINEERING & TECHNOLOGY

Zoom Meeting

Dr. Arvind ARAMBI JADYVA is presenting

10:02

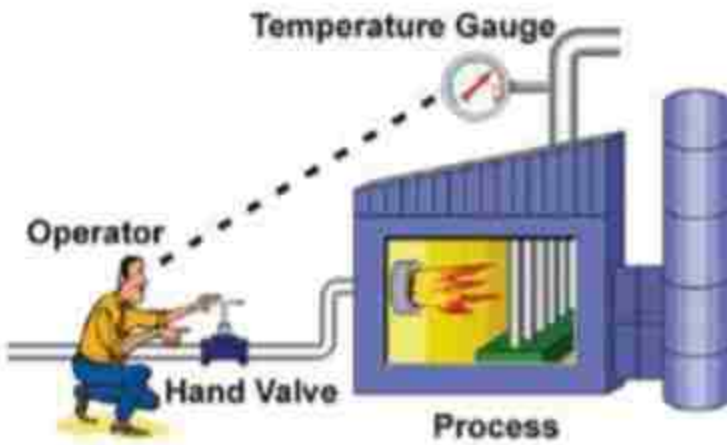
Programmable Logic Controller



Dr. Arvind ARAMBI JADYVA is presenting

10:02

Manual Control Example



Temperature Gauge

Operator

Hand Valve

Process

Fig: Operator performing manual control

Manual control of water temperature is a tedious process.

Problem

For example,

- To keep a constant temperature of water discharged from an industrial gas-fired heater.
- An operator has to watch a temperature gauge
- And adjust a fuel gas valve accordingly
- If the water temp. too high.
- The operator has to close the gas valve just enough to bring the temperature back to the desired value
- If the water gets too cold, he has to open the gas valve.
- Any change the operator makes to the gas valve affects the temperature, which is fed back to the operator, thereby controlling temperature

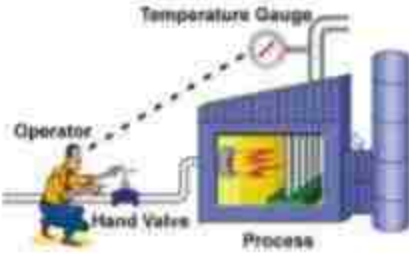


Fig: Operator performing manual control

AUTOMATION

- Automation is basically a delegation of human control function to control technical equipment.
- Automation is the use of control systems and information technologies reducing the need for human intervention.

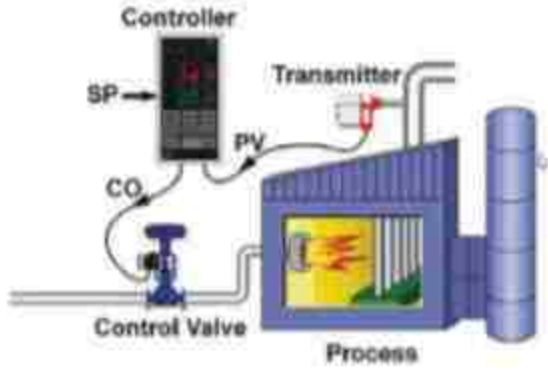
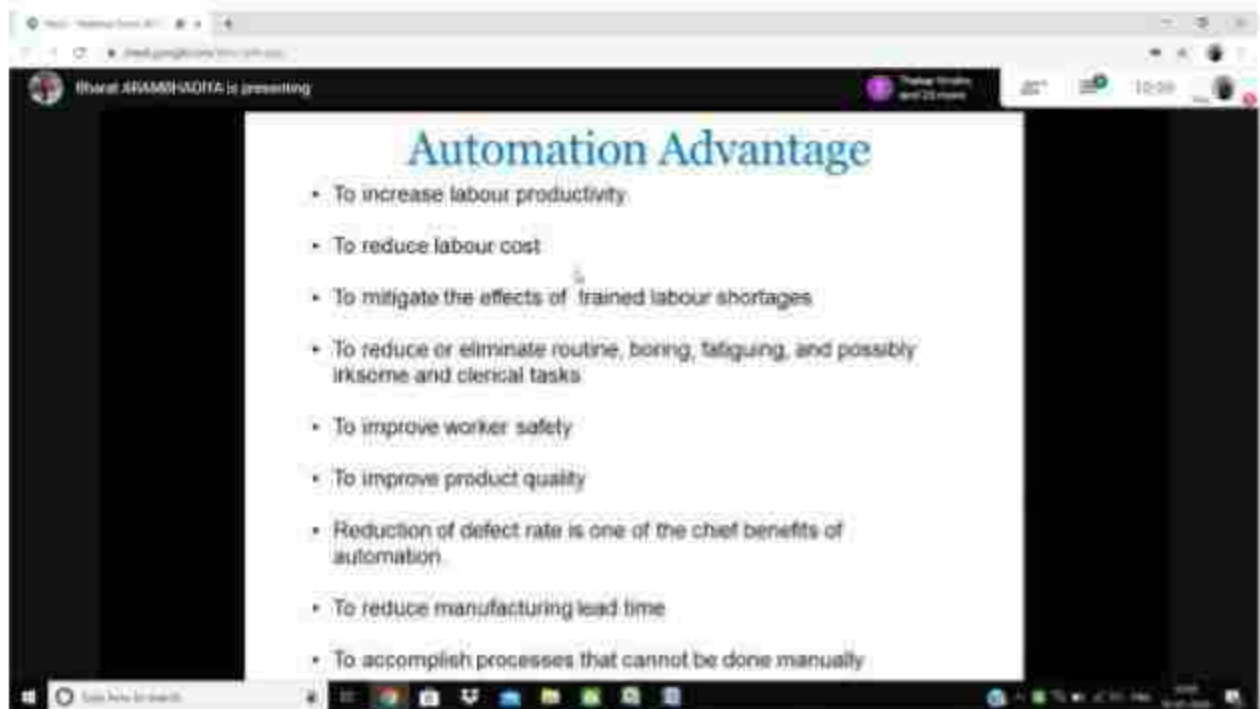


Fig: PID controller performing automatic control



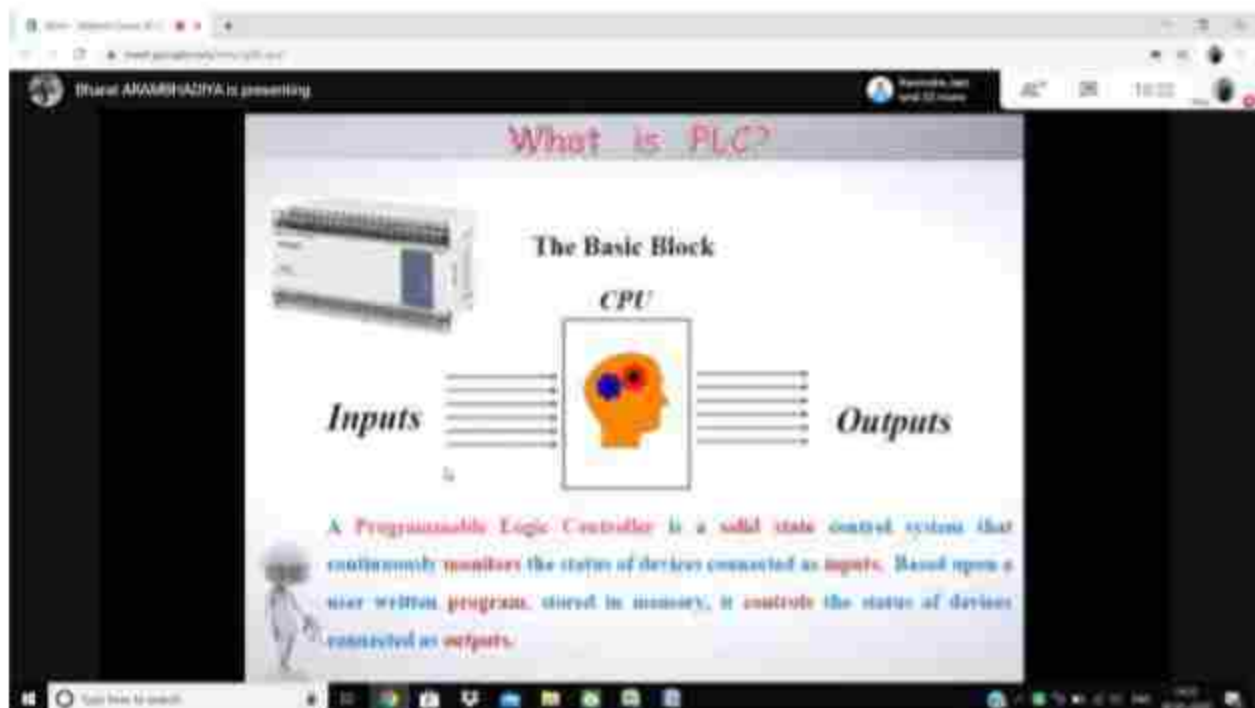
Automation Advantage

- To increase labour productivity
- To reduce labour cost
- To mitigate the effects of trained labour shortages
- To reduce or eliminate routine, boring, fatiguing, and possibly irksome and clerical tasks
- To improve worker safety
- To improve product quality
- Reduction of defect rate is one of the chief benefits of automation
- To reduce manufacturing lead time
- To accomplish processes that cannot be done manually



where Automation?

-  Cement & Fertilizer
-  Automobile
-  Food processing
-  Petrochemical
-  Oil & Gas
-  Water Treatment
-  Power Generation



What is PLC?

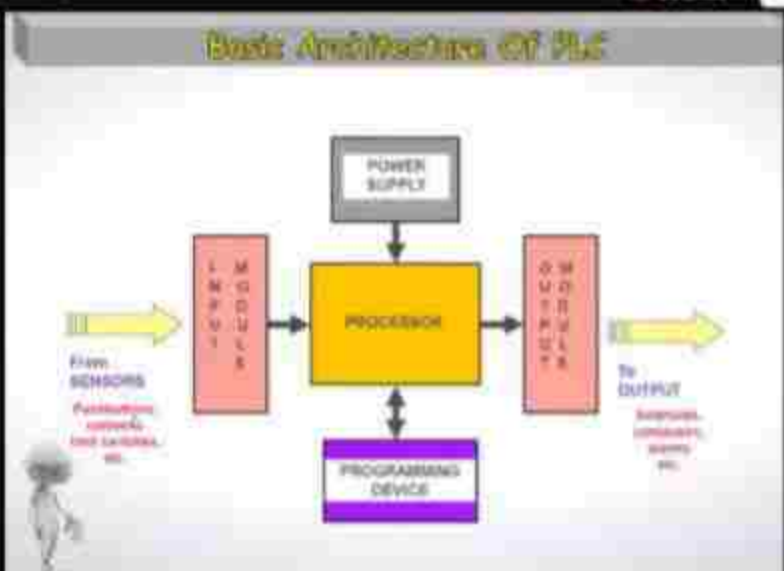


The diagram illustrates a closed loop control system. It consists of three main components: Sensors, Controller, and Actuator. The Sensors are shown on the left, the Controller is in the center, and the Actuator is on the right. Arrows indicate the flow of information from the Sensors to the Controller, and from the Controller to the Actuator. A feedback loop arrow returns from the Actuator to the Sensors, completing the closed loop. Below the diagram, the text reads "A closed Loop Control System".

Sensors Controller Actuator

A closed Loop Control System

Basic Architecture of PLC



The diagram shows the basic architecture of a PLC. It features a central yellow box labeled "PROCESSOR". Above the processor is a grey box labeled "POWER SUPPLY" with an arrow pointing down to the processor. Below the processor is a purple box labeled "PROGRAMMING DEVICE" with a double-headed arrow connecting it to the processor. To the left of the processor is a red box labeled "I M P U L S E" with an arrow pointing right to the processor. Below this box, text reads "From SENSORS Position, velocity, force, current, etc.". To the right of the processor is a red box labeled "O U T P U L S E" with an arrow pointing right away from the processor. Below this box, text reads "To Output Relays, solenoids, lamps, etc.". The entire diagram is enclosed in a white frame with a grey header.

POWER SUPPLY

I M P U L S E

PROCESSOR

O U T P U L S E

PROGRAMMING DEVICE

From SENSORS
Position, velocity,
force, current,
etc.

To Output
Relays, solenoids,
lamps,
etc.

Power Supply:

- Provides the voltage needed to run the primary PLC components

I/O Modules:

- Provides signal conversion and isolation between the internal logic-level signals inside the PLC and the field's high level signal.

Processor :

- Provides intelligence to command and govern the activities of the entire PLC systems.

Programming Device :

- Used to enter the desired program that will determine the sequence of operation and control of process equipment or

I/O Module

- The I/O interface section of a PLC connects it to external field devices.
- The main purpose of the I/O interface is to condition the various signals received from or sent to the external input and output devices.
- Input modules converts signals from discrete or analog input devices to logic levels acceptable to PLC's processor.
- Output modules converts signal from the processor to levels capable of driving the connected discrete or analog output devices.

Share ARAMBIADITYA is presenting

Programmable Logic Controllers

- Digitally operating electronic device.
- Uses a programmable memory for the internal storage of instructions for implementing specific functions such as logic, sequencing, timing, counting and arithmetic.
- Can control through digital or analog input or output modules, various types of machines or processes.



Share ARAMBIADITYA is presenting

PLC Advantages

- Handles much more complicated systems.
- Less and simple wiring.
- Easy programming.
- Increased Reliability.
- More Flexibility.
- Lower Cost.
- Faster Response.
- Easier to troubleshoot.
- Remote control capability.

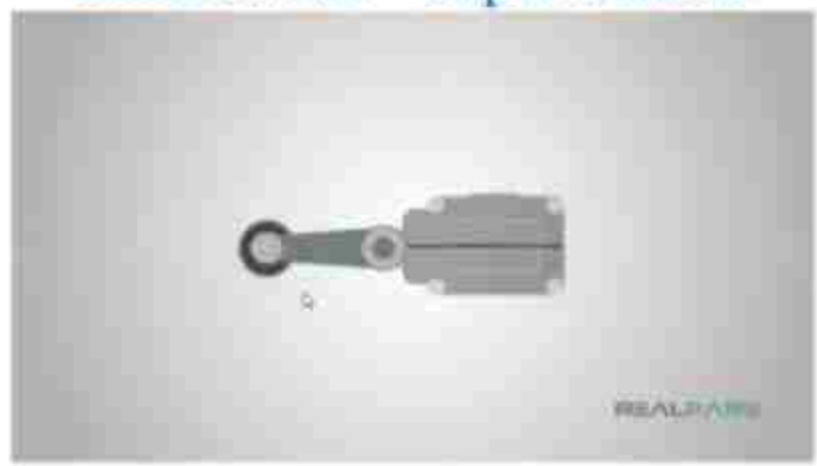


What are Inputs?

- Switches and Proximity
- Sensing Devices
 - Limit Switches
 - Photoelectric Sensors
 - Proximity Sensors
- Condition Sensors :
 - Pressure Switches
 - Level Switches
 - Temperature Switches
 - Vacuum Switches
 - Float Switches



Limit Switch -- Input Sensors



- A switch that flips when something got to a position and referred as "limit switch".
- It has two states – On and Off, True and False

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Proximity Sensor -- Input Sensors

Proximity Sensor



REALPAPER

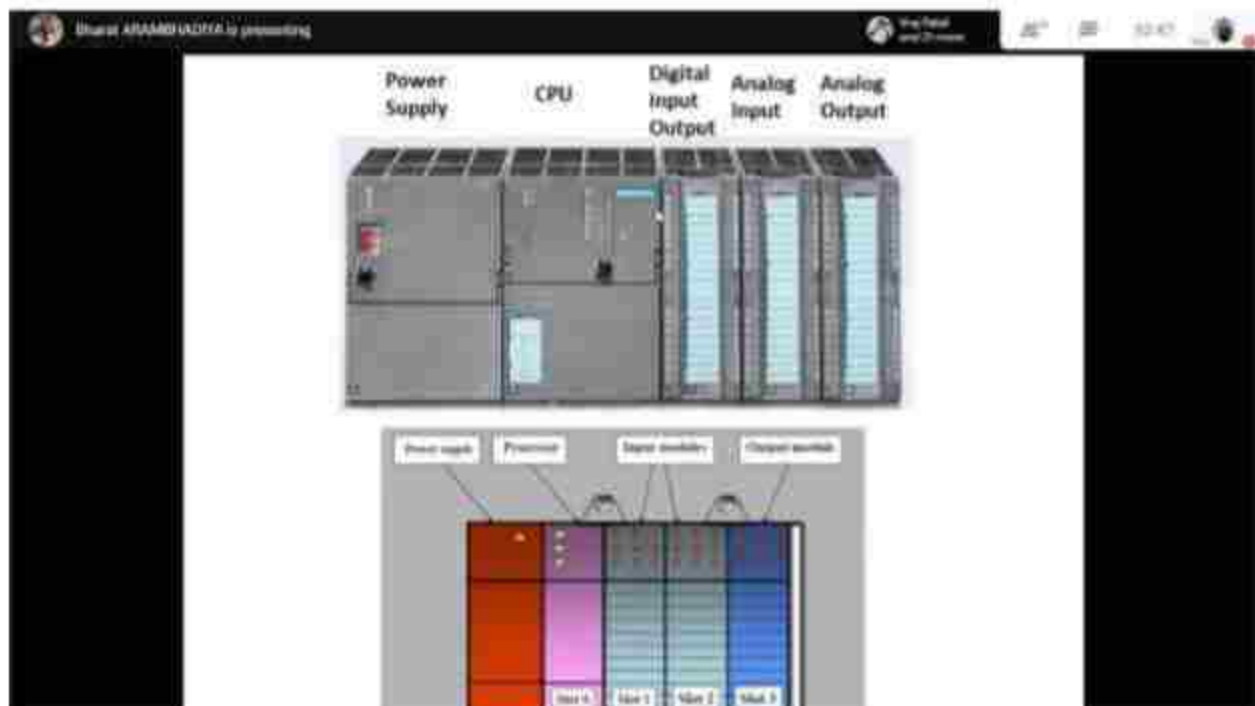
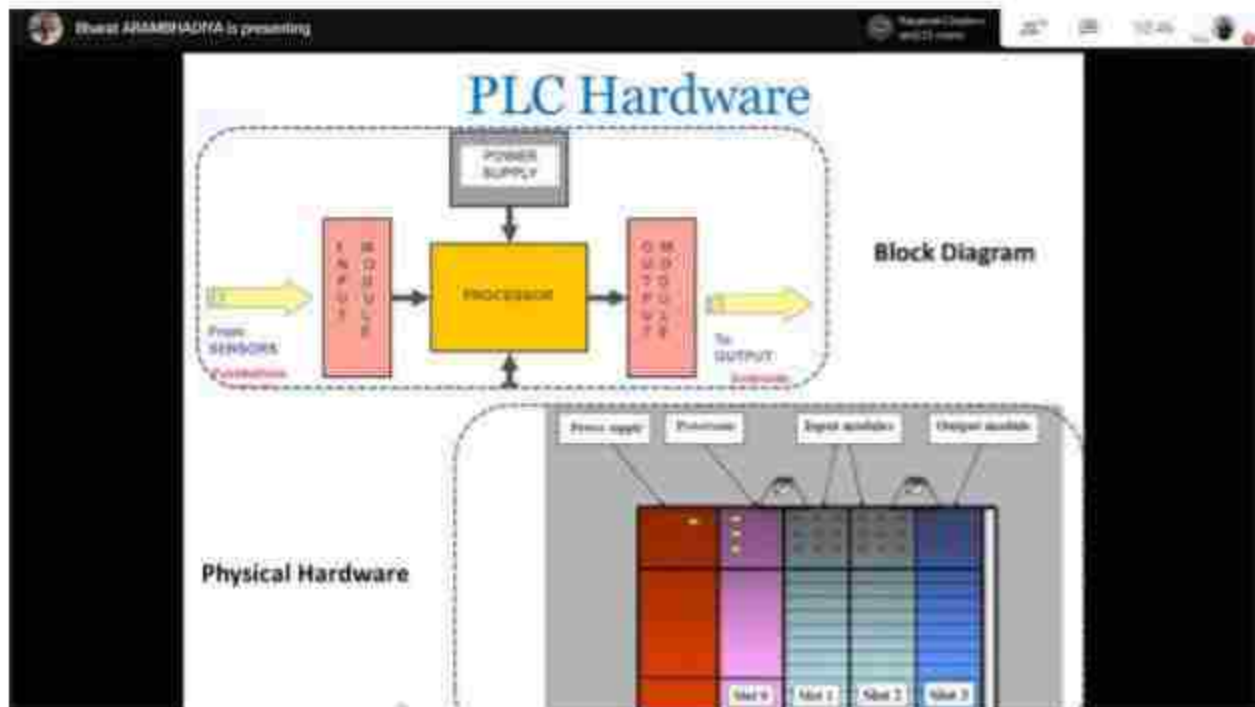
- Proximity sensors, very often called "proxes", are used for detecting close metal objects using magnetic fields.
- In many environments, these have replaced limit switches in position.

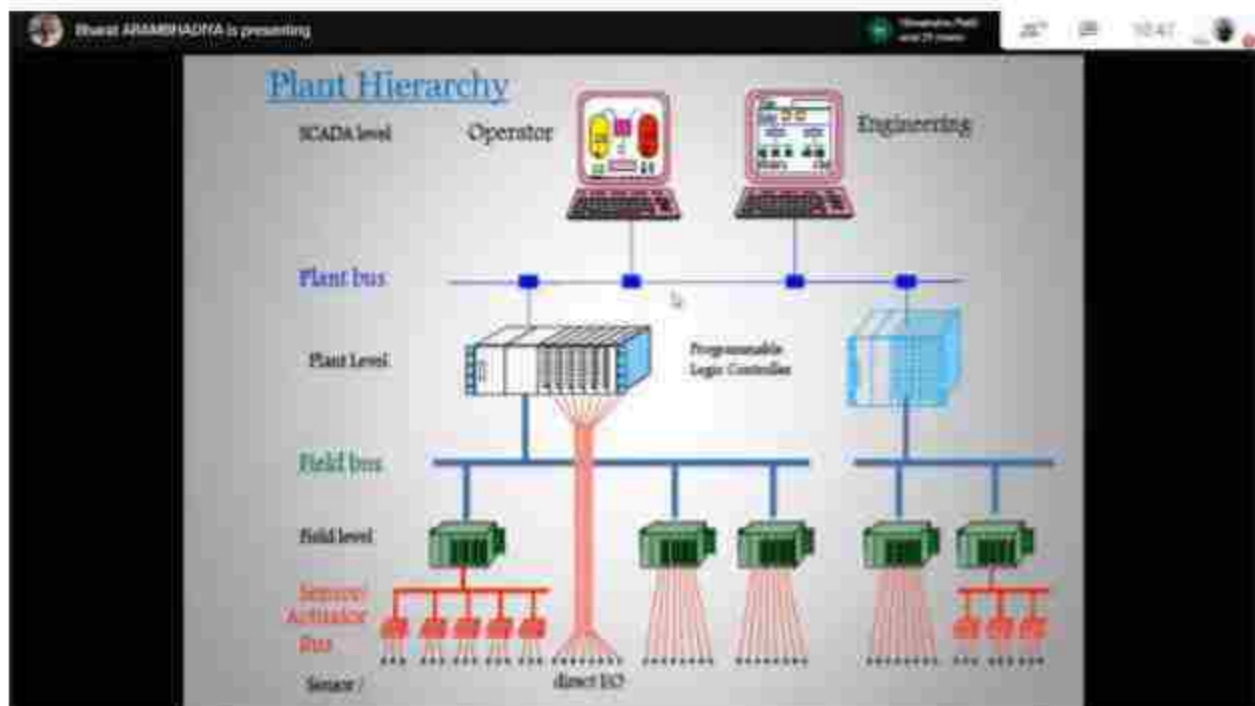
Share ARAMBIADITYA is presenting

What are Outputs?

- Valves
- Motor Starters
- Solenoids
- Actuators
- Control Relays
- Horns & Alarms
- Stack Lights
- Fans
- Counter
- Pumps







SCADA

Supervisory Control And Data Acquisition

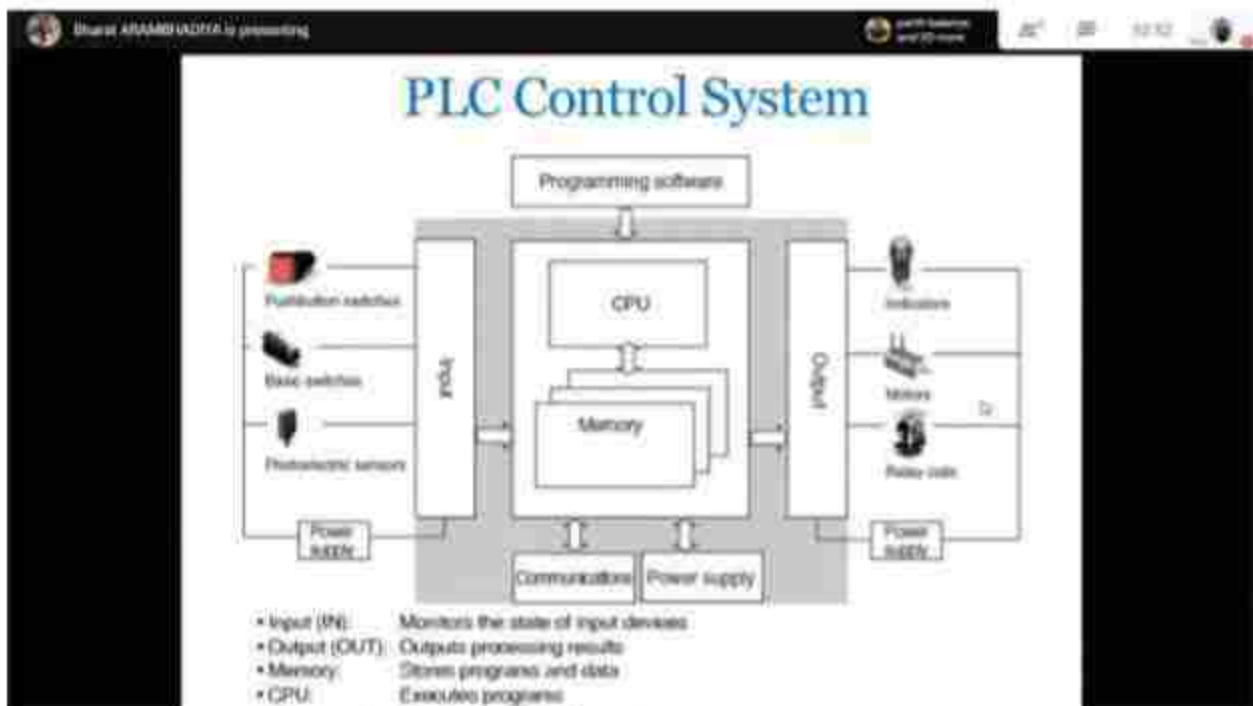
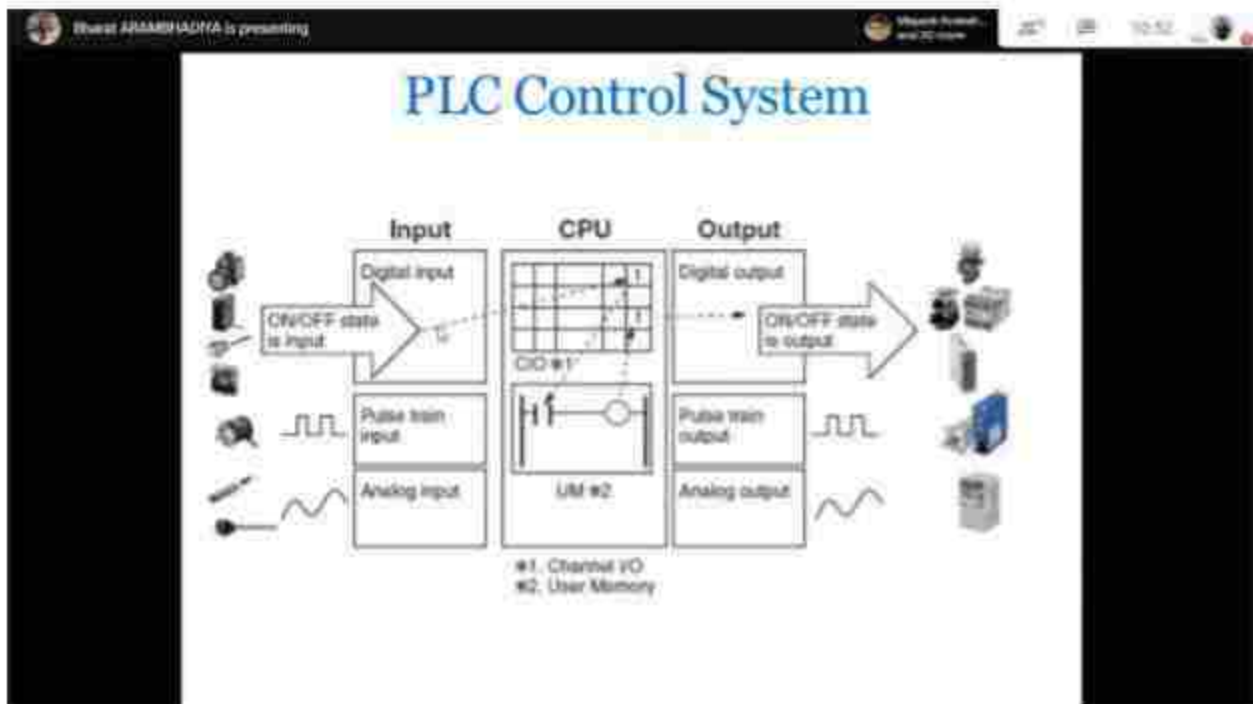
What is SCADA?

SCADA is "Supervisory Control And Data Acquisition". Real-time industrial process control systems used to centrally monitor and control remote or local industrial equipment such as motors, valves, pumps, relays, sensors, etc. SCADA is Combination of telemetry and Data Acquisition.

SCADA is not just a hardware, neither a software. It's a concept, it's a system as a combination of special hardware, software and protocols.

SCADA is used to control chemical plant processes, oil and gas pipelines, electrical generation and transmission equipment, manufacturing facilities, water purification and distribution infrastructure, etc.

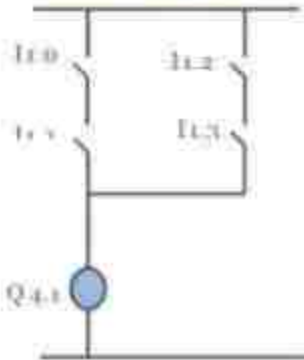




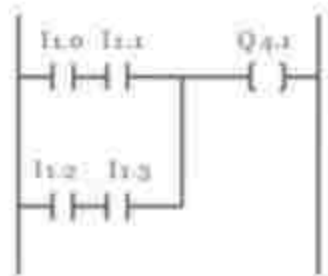
PLC Programming Language

- Ladder Diagram (LAD)
 - Use relay logic symbols to formulate the control task

- Circuit Diagram

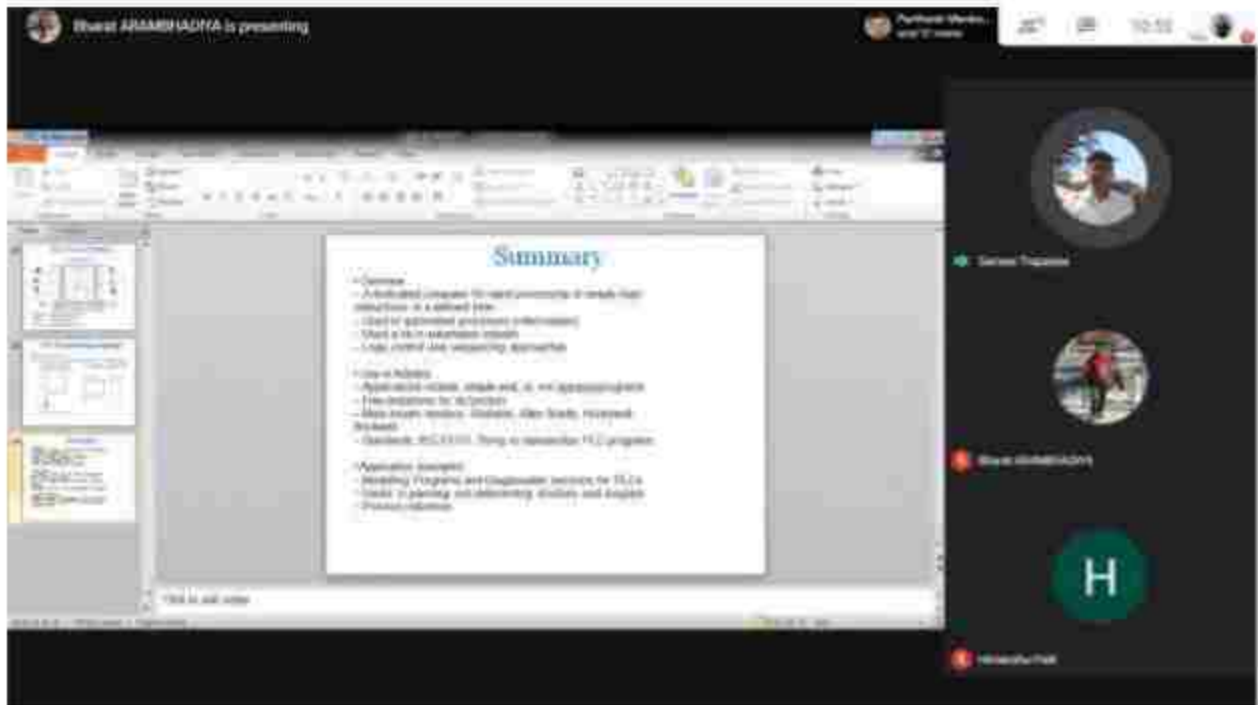


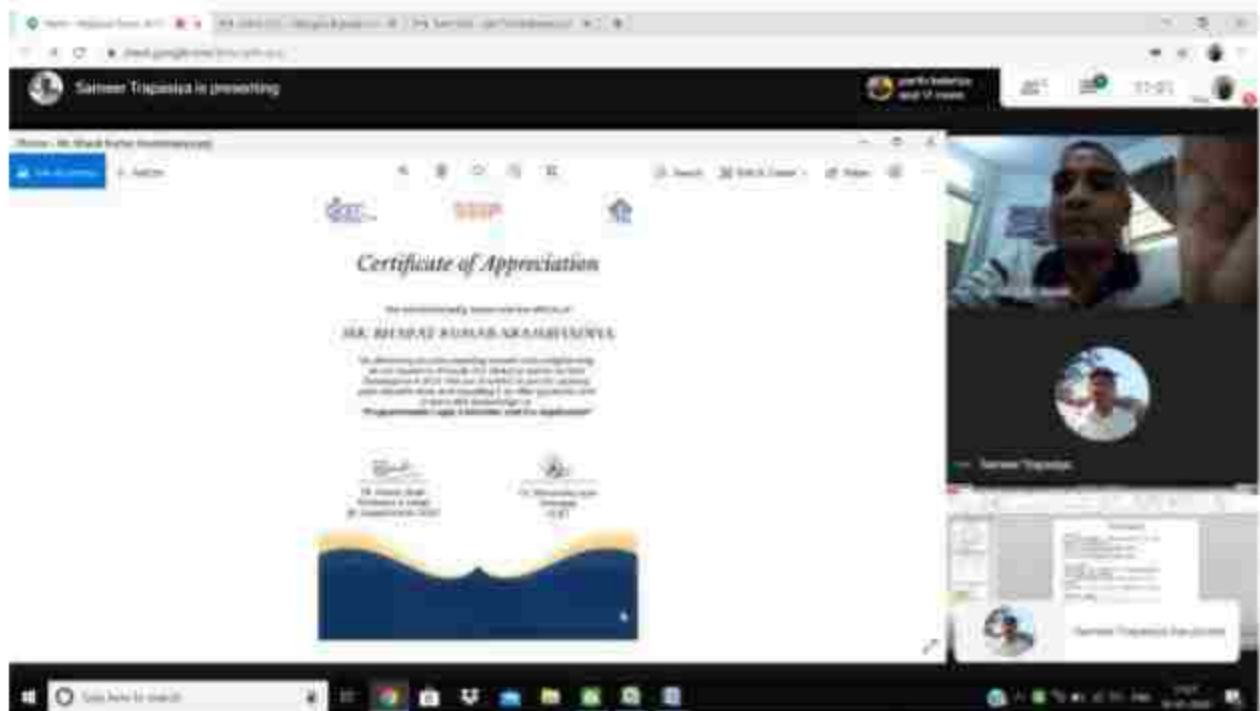
- Ladder Diagram (LAD)



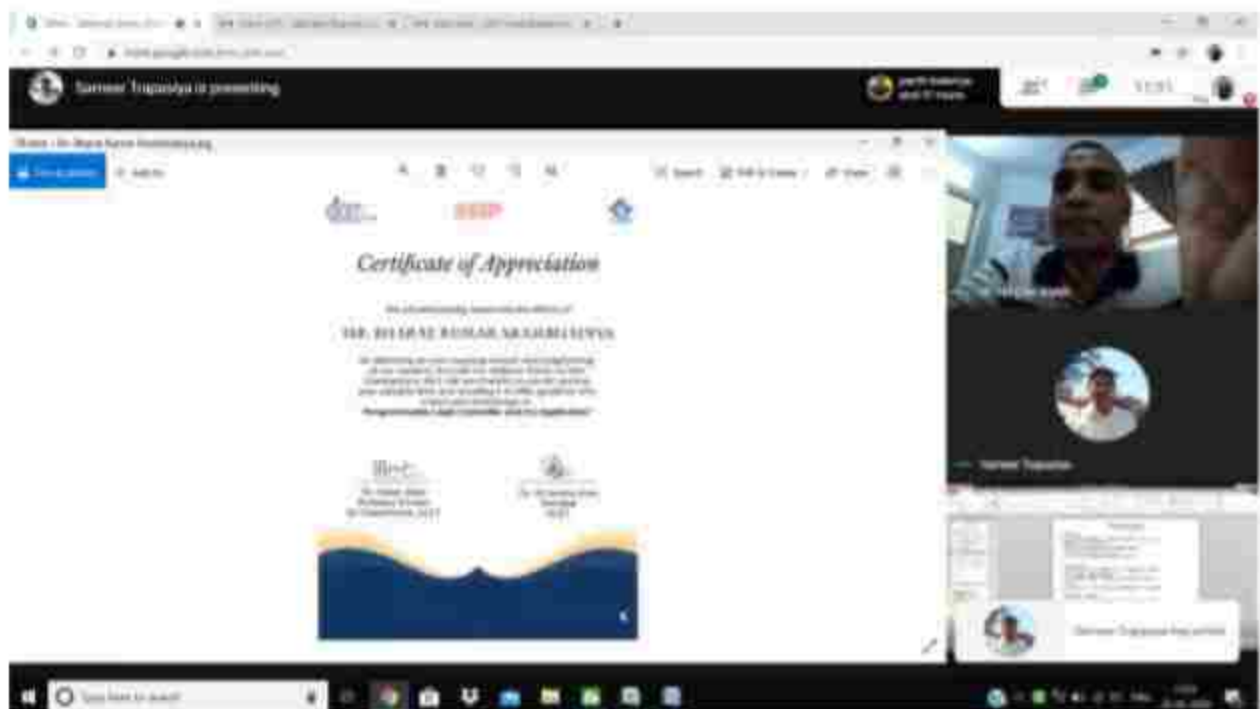
Summary

- Overview
 - A dedicated computer for rapid processing of simple logic instructions in a defined time
 - Used in automated processes (rollercoaster)
 - Used a lot in automated industry
 - Logic control and sequencing approaches
- Use in Industry
 - Applications include simple and, or, not lagrams/programs
 - Few limitations for its function
 - Main known vendors: Siemens, Allen Brady, Honeywell, Rockwell
 - Standards: IEC 61131. Trying to standardize PLC programs
- Application examples
 - Modelling Programs and Diagnosable functions for PLCs
 - Useful in planning and determining structure and diagram
 - Process industries

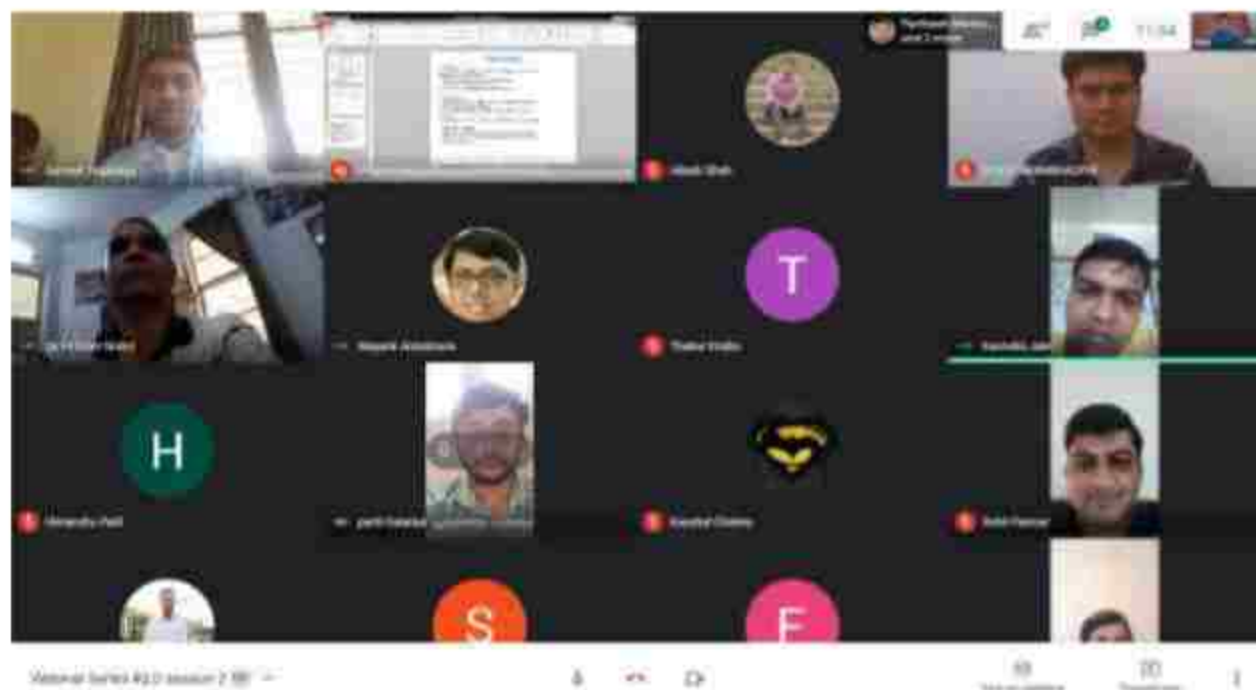
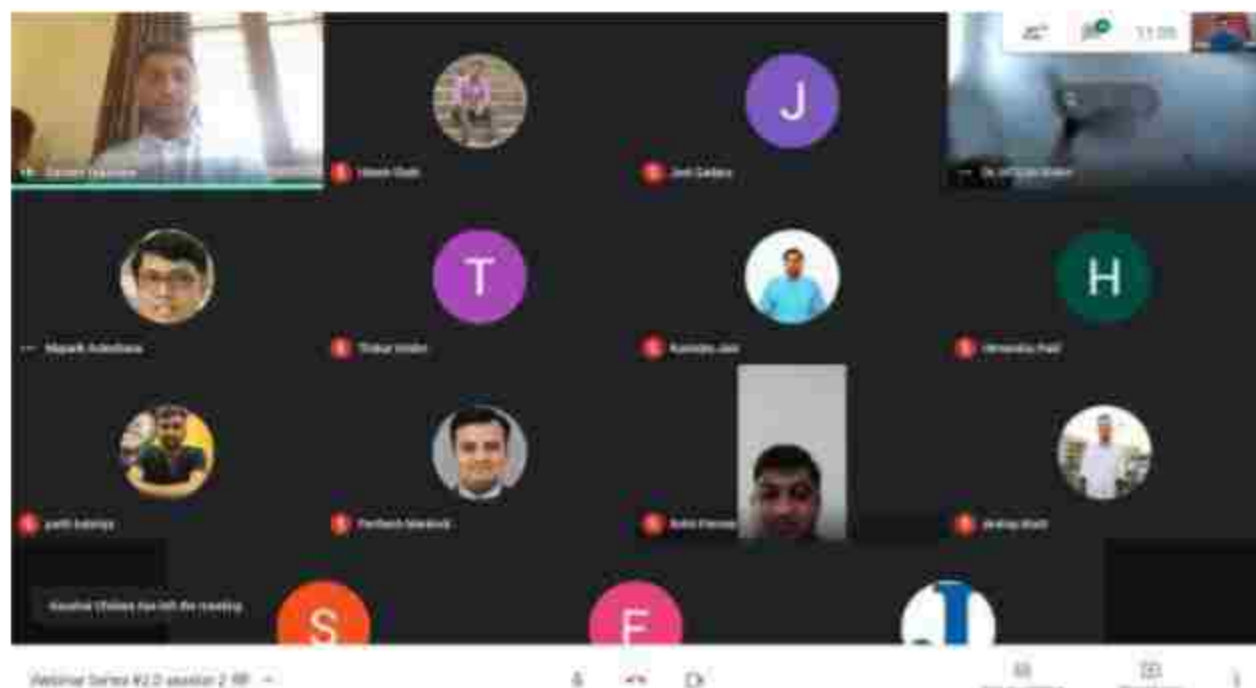




This screenshot shows a Zoom meeting interface. The main window displays a 'Certificate of Appreciation' from GCET. The certificate is addressed to **DR. BHANUPRIYA KUMAR SAKSHAMI DEVI** for her contribution to the 'SPP' program. The certificate is signed by the Director of GCET, Vallabh Vidyanagar, and dated 27/07/2023. The Zoom meeting controls at the bottom show the meeting is titled 'Sattam' and is currently in progress.



This is a duplicate of the screenshot above, showing the same Zoom meeting interface with the 'Certificate of Appreciation' for Dr. Bhanupriya Kumar Sakshami Devi. The certificate details and the Zoom meeting controls are identical to the first image.



Registered student details

SEMESTER	FIRST NAME	LAST NAME
SEM 4	FALDU	VASU
SEM 4	Akshay	Bhatt
SEM 4	PARTH	KALARIYA
SEM 4	Anupam	Kanungo
SEM 2	Bhruqu	Dave
SEM 4	Het	Bhadja
SEM 4	Mihir	Barpande
SEM 4	Kaushal	Cholera
SEM 4	Kaival	Prajapati
SEM 4	Tarvi	Bhankhar
SEM 4	Rajesh	Nakum
SEM 4	Piyush	Gupta
SEM 2	Himanshu	Patil
SEM 4	Mihir	Bhadani
SEM 4	Dweejal	Shah
SEM 4	Meet	Bhanderi
SEM 4	Kapuriya	brljeish
SEM 4	Kishan	Timbadiya
SEM 4	Mit	Patel
SEM 4	Bhavin	Makwana
SEM 2	Gourav	Paul
SEM 4	Jay	Raniga
SEM 2	Vraj	Patel
SEM 4	Kalp	Sheth
SEM 4	Jay	Isamaliya
SEM 4	Rutvik	Bodar
SEM 4	Ajaysinh	Jadeja
SEM 2	Dharmik	Vanani
SEM 4	Rushabh	Mehta
SEM 4	Achyut	Sapariya
SEM 4	Siddhanth	Pai



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SEM 4	Mit	Patel
SEM 2	Kush	Gandhi
SEM 4	Giriraj	Shah
SEM 4	Vaibhav	Sanghavi
SEM 4	Riya	pandya
SEM 4	Nandani	Patel
SEM 4	Deep	Vekariya
SEM 4	Drasti	Domadiya
SEM 2	Tirth	Makadia
SEM 4	Smeet	Shah
	Satyamkumar	Lodhiya
	Jaydeep	Chodavadiya
	Shubham	Sharma