School of Computer Information and Mathematical Sciences

Department of Computer Science and Engineering

One week Short Term Training Programme (STTP) - Online

On

Internet of Things – Everything Future

Sponsored by

AICTE

Slot -2: 07th September 2020 to 12th September 2020

Session – Report

Programme Co-ordinator
Dr.S.Revathi,Professor,CSE
Dr.N.Sabiyath Fatima, Asso. Prof. CSE
Dr.Muthu Priya, Asst. Prof (Sl.Gr),CA

Conveners
Dr. Venkatesan Selvam, Dean, SCIMS
Dr. E. Syed Mohamed, Prof.&Head, CSE

PREAMBLE

The department of Computer Science and Engineering, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai organized a Short Term Training Programme on Internet of Things – Everything Future in association with AICTE from 07th September 2020 to 12th September 2020. This programme was successfully conducted and coordinated through the online portal with dedicated sessions. The STTP program received an overwhelming response with 228 participants from various institutions/colleges approved by AICTE and affiliated to various Universities across India. This STTP is conducted for one week which comprised of technical session and hands on training session on different spectrum of IoT. Everyday three sessions were conducted to ensure the participants received the effective knowledge through this programme. Those people who develop the ability to continuously acquire new and better forms of knowledge that they can apply to their work and to their lives will be the movers and shakers in our society for the indefinite future.

Day-1 (07.09.2020)

Inauguration Session and Session 1 :

STTP was inaugurated at 9.30 am on 07th September 2020 with the inaugural address by Dr.Venkatesan Selvam, Dean, SCIMS, BSACIST, Chennai. Dr.S.Revathi, Professor & Co-ordinator of the STTP has briefed the objective of the Short Term Training Program and the overall schedule of the STTP. Dr.V.Muthu Priya, Asst. Professor(Sl. Gr.), Computer Applications Department, BSACIST has introduced the chief guest Mr. Durai Kalaiselvan, Founder, Cumilisys LLC, USA. He is the founder of Cumilisys LLC, USA- a technology focused service organization. The chief guest Mr. Durai Kalaiselvan gave an inaugural talk on the topic of Industrial IoT, which is going to be the future of smart industries. He discussed on evolution of Internet and IoT categories. He detailed on comparison between Statistical and Predictive Analytics. Also, he discussed how the predictive analytics in industry helps for the growth of high business value. Later he gave case study on "Wind Turbine using IoT", in which he explained IOT implementation in wind turbine, predictive maintenance techniques to predict failures and how the predicted inspection cost could be lowered during the time of failures. Vote of Thanks was delivered by Dr.N.Sabiyath Fatima, Associate Professor, CSE Department, BSACIST, in which she paid her gratitude towards all the dignitaries.
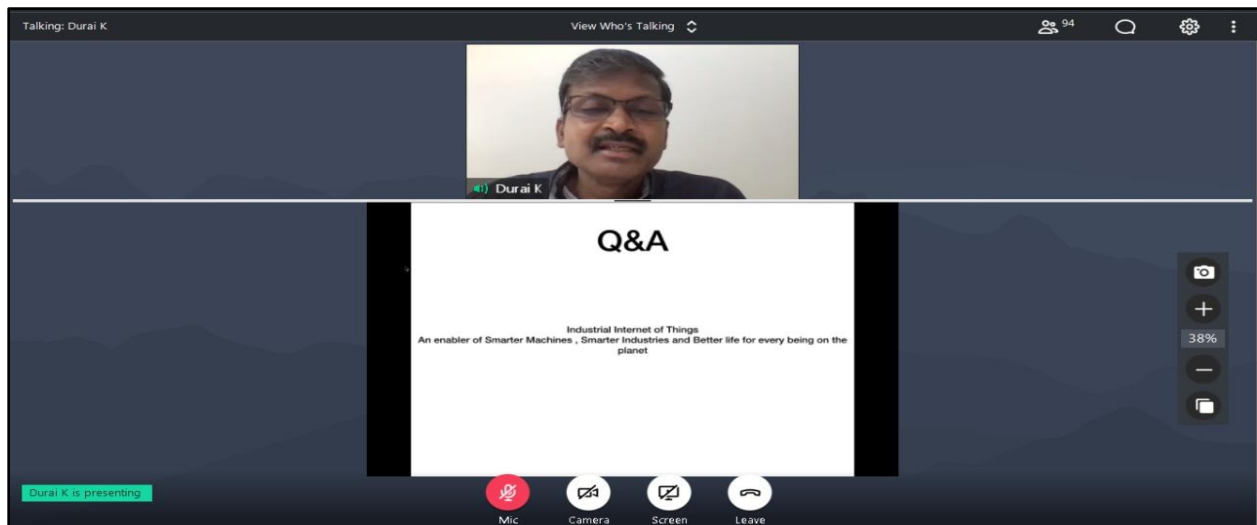
STTP on Internet of Things – Everything Future: Mr. Durai Kalaiselvan, Founder, Cumilisys LLC, USA on his inaugural talk on the topic of Industrial IoT.
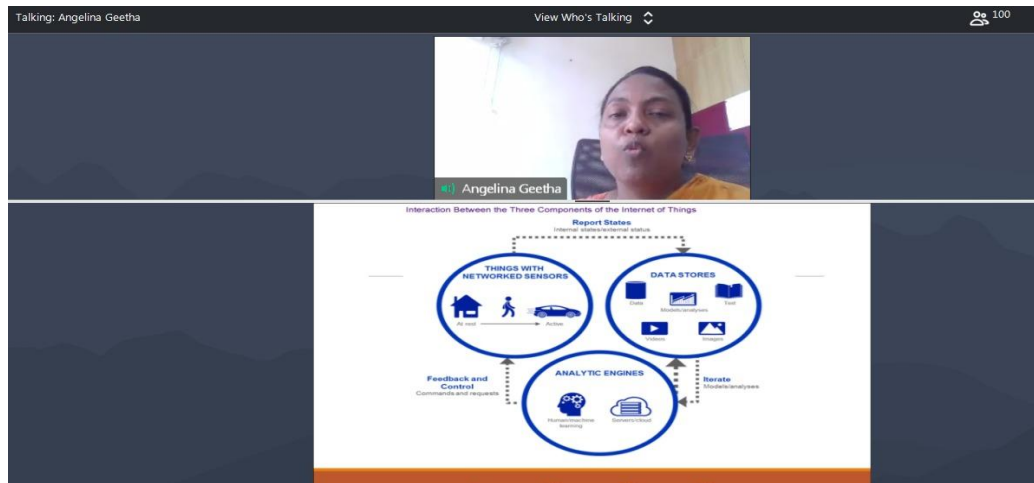
On Session 2:

Topic : Introduction to Internet of Things and Architecture

Resource Person : Dr.Angelina Geetha,
Professor & Head(SCS), Hindustan Institute of Technology and Science, Padur, Chennai.

Dr. Revathi, Professor, BSACIST, Chennai has commenced the session by welcoming the resource person. After that, the resource person of this session, Dr.Angelina Geetha, equipped

the participants with the objective, importance and various sources of literature collection relating to IoT. She discussed in detail the different layers of IoT Architecture. Also gave an overview on IoT application. Further, she provided some insights on research directions in IoT. She discussed the basic concepts used in the technology relating with best suitable real life examples which are essential for the understanding of technology.

STTP on Internet of Things – Everything Future: Dr.Angelina Geetha, Professor & Head(SCS), Hindustan Institute of Technology and Science, Chennai deliver the presentation on Introduction to Internet of Things and Architecture.

On Session 3:

Topic : Sensors, actuators & Interfacing

Resource Person : Dr.Malleswaran,
Professor & Head incharge, ECE Department, Anna University, Kancheepuram.

The Speaker of the Session Dr.M.Malleswaran shared his knowledge on internal operations of sensors and need for it in IoT. Also, he presented more on different types of sensors and actuators for IoT application. He explained the architecture diagram of computer process control system. He further added to it, the importance of interfacing in IoT process where it involves the communication between the device and computer networks. He detailed the process of Analog to Digital convertor and Digital to Analog convertor in the interfacing process.

STTP on Internet of Things – Everything Future : Dr.Malleswaran, Professor & Head incharge, ECE Department, Anna University delivers how to choose sensor for different applications
Day-2 (08.09.2020)

On Session 1:

Topic : IoT Data Link Layer protocols & IoT Network Layer Protocols

Resource Person: Dr.Pushpalatha,
Professor, SRM Institute of Science and Technology, Chennai.

The Speaker of the Session Dr.Pushpalatha presented topics related to "IoT Data Link Layer protocols & IoT Network Layer Protocols". She projected a clear understanding of the importance of LoRaWAN and future problems in the real world. She emphasized on Applications of Zigbee Technology through a hands-on project. She projected on comprehending the theoretical concepts and relating to the practical aspects of Industrial Automation, Home Automation, Smart Metering and Smart Grid monitoring. She insisted on Bluetooth Low Energy (BLE) which is a low power wireless technology used for connecting devices with each other.She also added on concepts relating to Network Layer- Encapsulation Protocols-LoWPAN.

STTP on Internet of Things – Everything Future: Dr.Pushpalatha, Professor, SRM Institute of Science and Technology, Chennai delivers the presentation on IoT Data Link Layer protocols & IoT Network Layer Protocols.
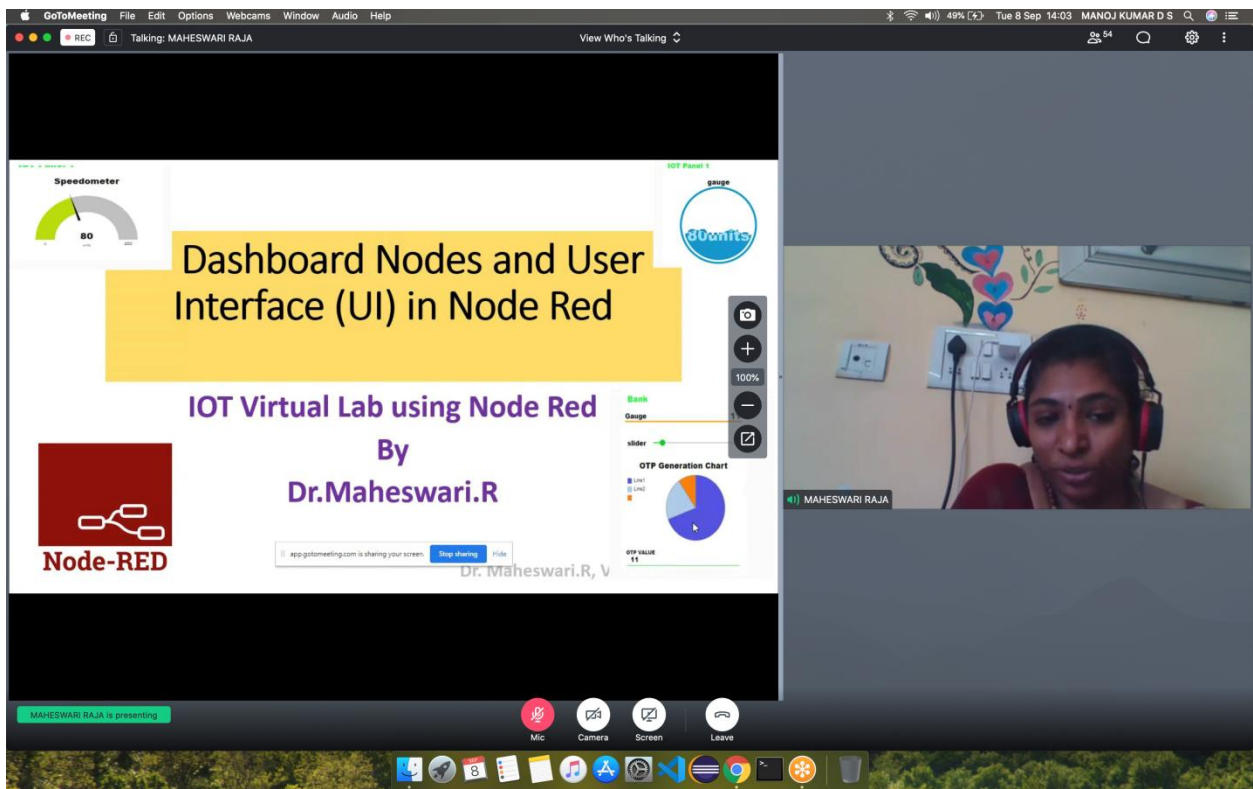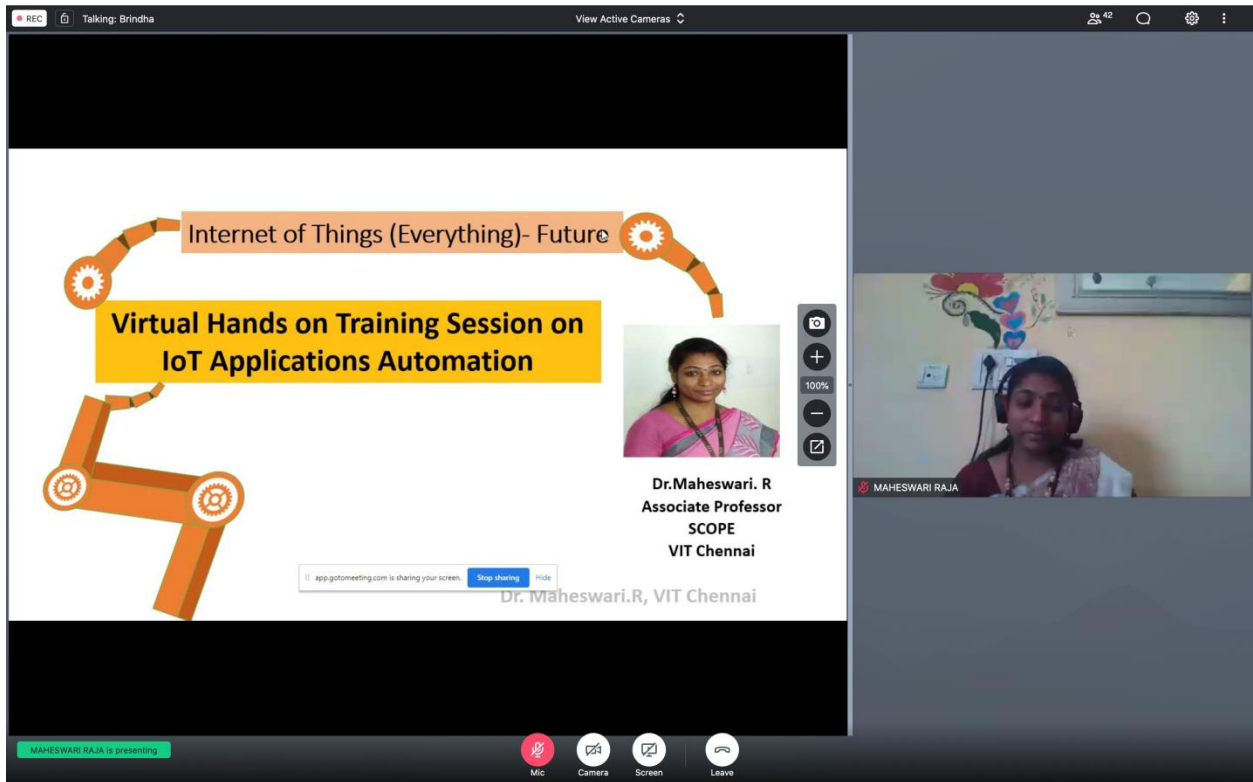
On Session 2 & 3:

Topics :

- IoT devices, protocols, dashboard automation using Node Red Simulation
- IoT automation using Node Red simulation through nodes, MQTT broker, UI Display

Resource Person: Dr.Maheswari R,
Associate Professor, School of Computer Science and Engineering, VIT, Chennai.

The Speaker of the Session Dr.Maheswari R presented topics related to Virtual Hands on Training Session on IoT Applications Automation. She gave a brief introduction about the IoT Protocol Contained application protocol (CoAP), Message Queuing Telemetry Transport MQTT, Extensible Messaging and Presence Protocol (XMPP), Advanced Message Queuing Protocol (AMQP). Step by step installation guidance on Node Red was given by Dr. Maheswari to all the participants, during which lot of queries asked by the participants were addressed by her then and there.

On session 3, she explained the key features and benefits of Node Red. Followed by which she explained how to access the editor in a web browser, how to drag one node on to the workspace from the palette, how to add debug node, function node deployment. She also showed how to connect the wire from the output port of one to input port of another.

STTP on Internet of Things – Everything Future: Dr.Maheswari R, Associate Professor, School of Computer Science and Engineering, VIT, gives Virtual Hands on Training session of IoT Applications Automation.

Day-3 (09.09.2020)
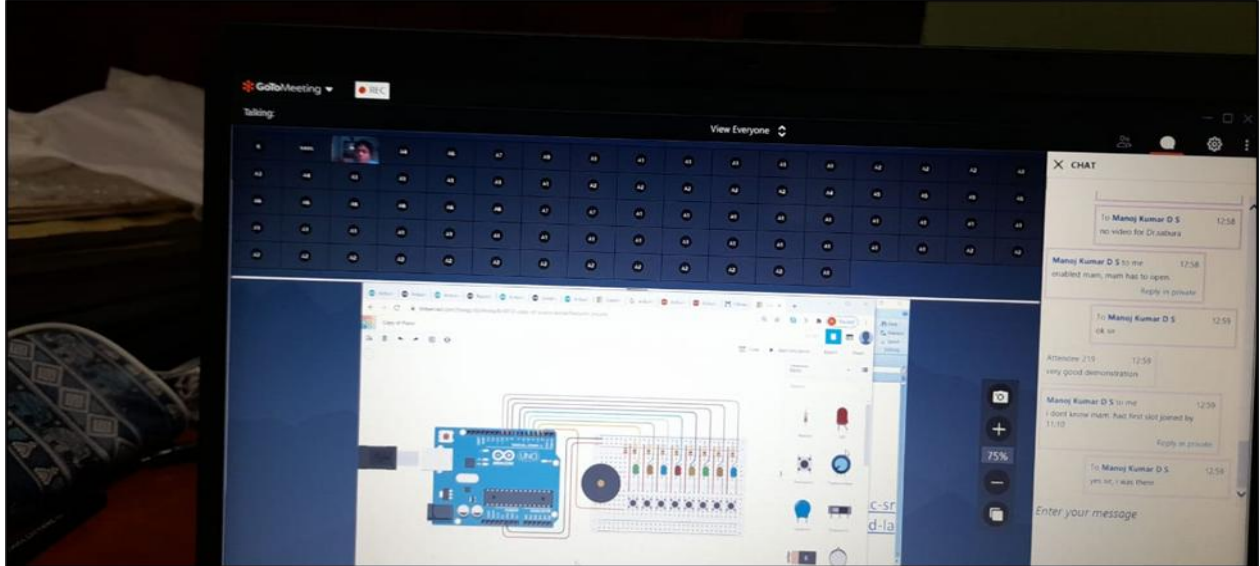
On Session 1,2 &3:

Topics Covered :

- Arduino board and its functions
- Hands on Training using Tinker card- Arduino Programming and Sensors interfacing
- Mobile App Inventor

Resource Person : :   Dr.Sabura Banu,
Founder & CEO, Intellectz Tech For All, Chennai.

The speaker of the session Dr. Sabura Banu started with brief introduction of IoT. How IoT works and the structure of the IoT. She forecasted the Global IoT Market. She clearly discussed the massive potential of IoT. And then listed out the application of IoT. The ultimate goal of IoT is to automate human Life has explained briefly. She gave many interesting applications of IoT like smart Garbage Cans and smart mirror. She focused with Technological challenges of IoT, Criticisms and controversies of IoT.

On Session 2 and 3, Dr. Sabura Banu started Hands on Training using Tinker card- Arduino Programming and Sensors interfacing. Few latest addition of Arduino projects were demonstrated and described about ARDUINO and discussed about its features in detail. She gave hands on session on Tinker card and Mobile App Inventor and showed how to use the features and tools in it. It was a very interactive session and all the faculties and the research scholars were involved with real interest in the hands on session.
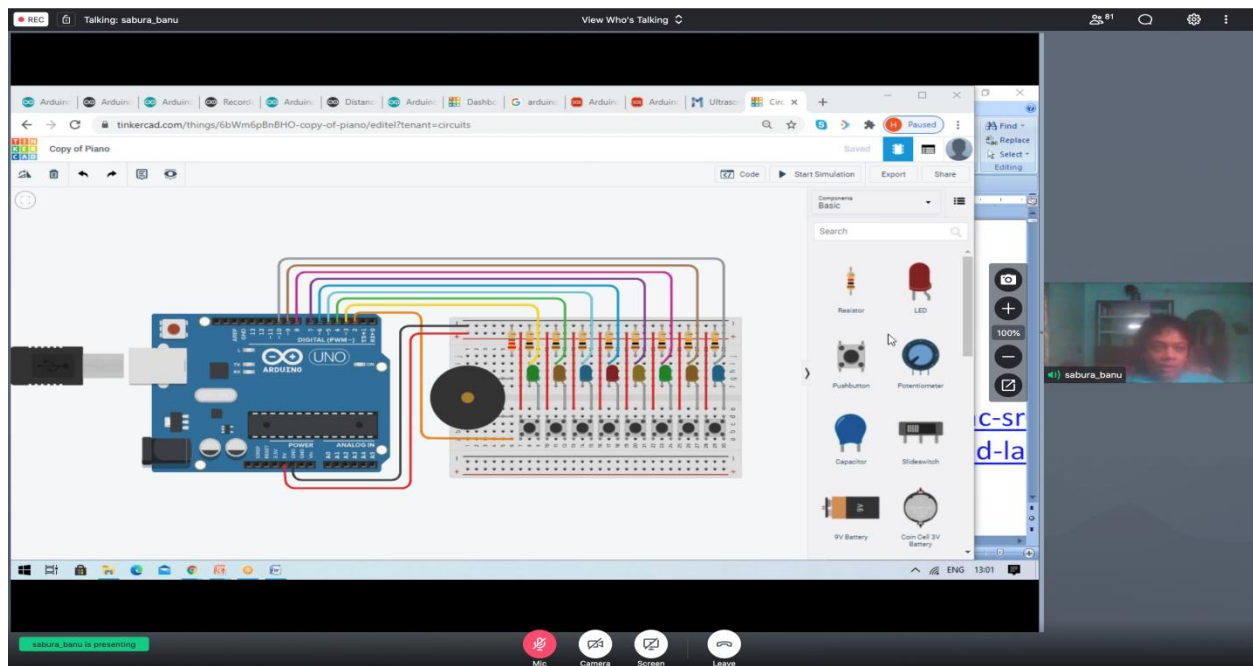
STTP on Internet of Things – Everything Future: Dr. Sabura Banu, Founder & CEO, Intellectz Tech For All, Chennai delivers the hands on training on Tinker card- Arduino Programming and Sensors interfacing.
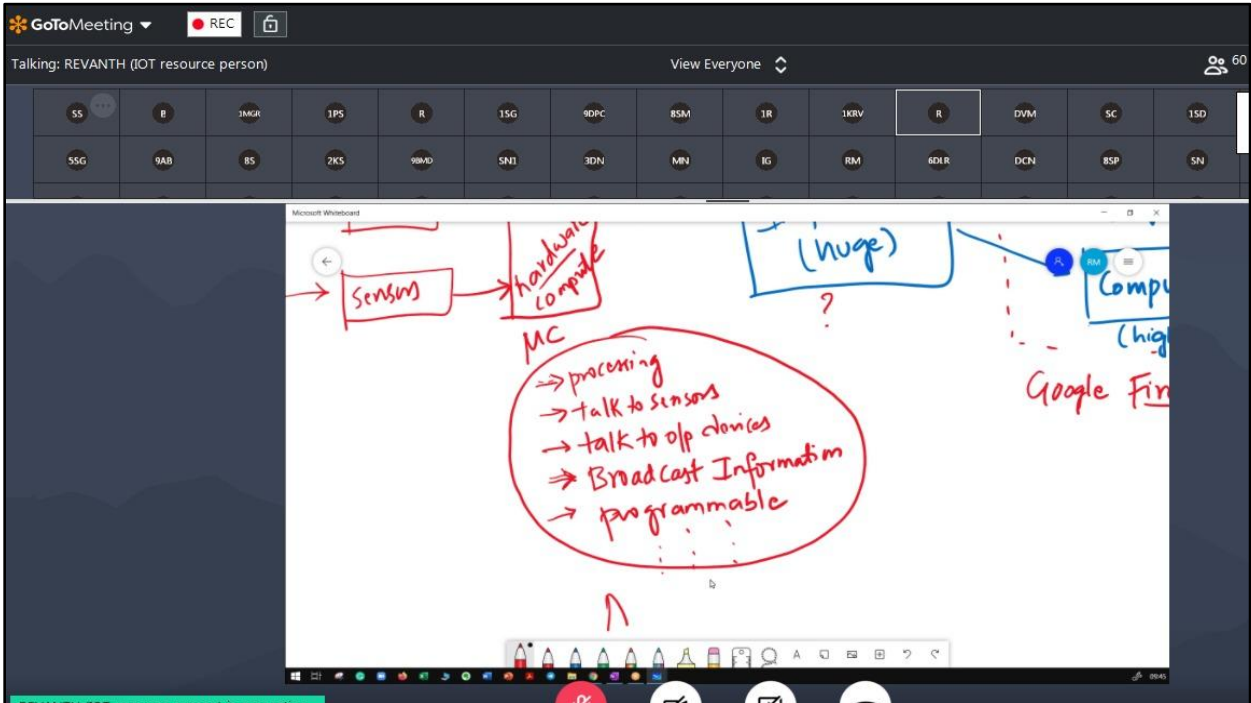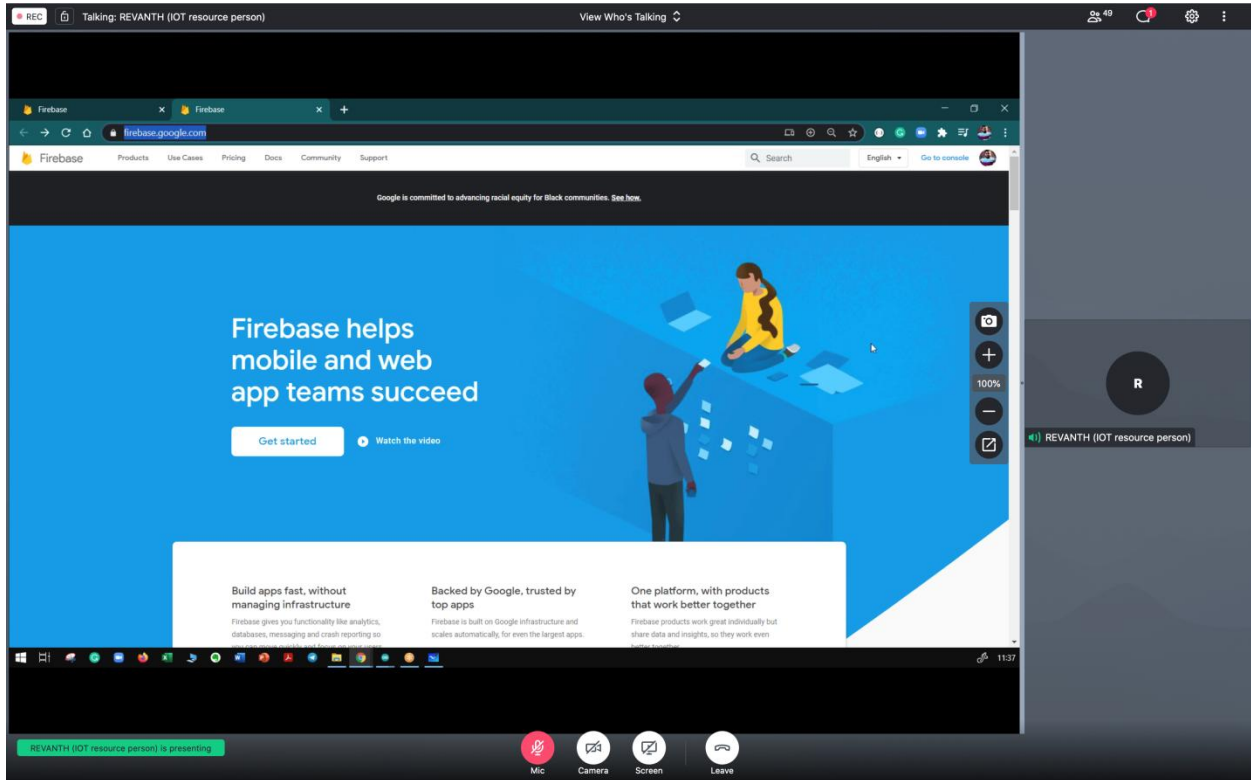
Day-4 (10.09.2020)

On Session 1 & 2:

Topic : Internet of Things – Cloud Integration

Resource Person: Mr.Revanth Kumar,
CEO, Unturtle Technologies,Hyderabad.

The Speaker of the Session Mr.Revanth Kumar presented topics related to "IoT Cloud Integration". He projected a clear understanding of the Greater usage of the IoT in cloud that has acted as a catalyst for the development and deployment of scalable Internet of Things applications and business models. He clearly explained that the cloud computing and IoT have become two very closely affiliated future internet technologies with one providing the other a platform for success. He explained IoT in cloud offers public cloud services which can easily help the IoT area, by providing third party access to the infrastructure. He explained IoT devices need a lot of storage to share information for valuable purposes.

He described that IoT in cloud, like the StoneFly, Cloud Connect to Microsoft Azure can provide customers with greater space which can increase as per the users demand, helping to resolve the storage needs of customers. He described that IoT in cloud provides the connectivity which is necessary to share information between the devices and make meaning from it at a fast pace. He insisted that Internet Cloud Computing infrastructures help IoT to give meaning to the

greater amount of data generated.

STTP on Internet of Things – Everything Future: Mr.Revanth Kumar, CEO, Unturtle Technologies, Hyderabad delivers the presentation on Internet of Things – Cloud Integration.
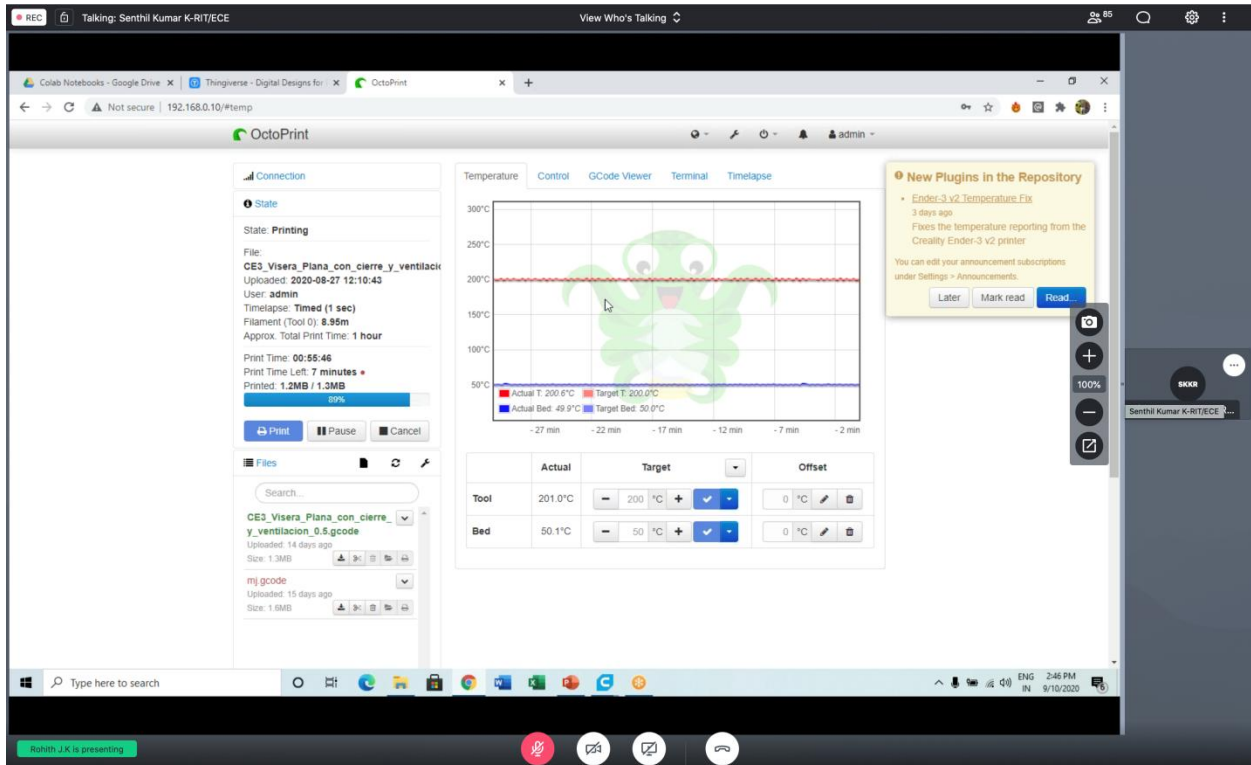
On Session 3:

Topic : Industrial 4.0 with additive manufacturing

Resource Person : Mr.J.K.Rohith,
Director, Madras Scientific Research Foundation, Chennai.

The Speaker of the Session Mr.J.K.Rohith presented topics related to "Industry 4.0 Additive Manufacturing". He explained how the Fourth Industrial Revolution (or **Industry 4.0**) is changing the traditional manufacturing and industrial practices, using modern smart technology. He discussed the concept of additive manufacturing relating with best suitable real life examples with the 3D printing which are essential for the understanding of technology. He projected a live demo on manufacturing of face shield for COVID -19 protection through additive manufacturing technology.
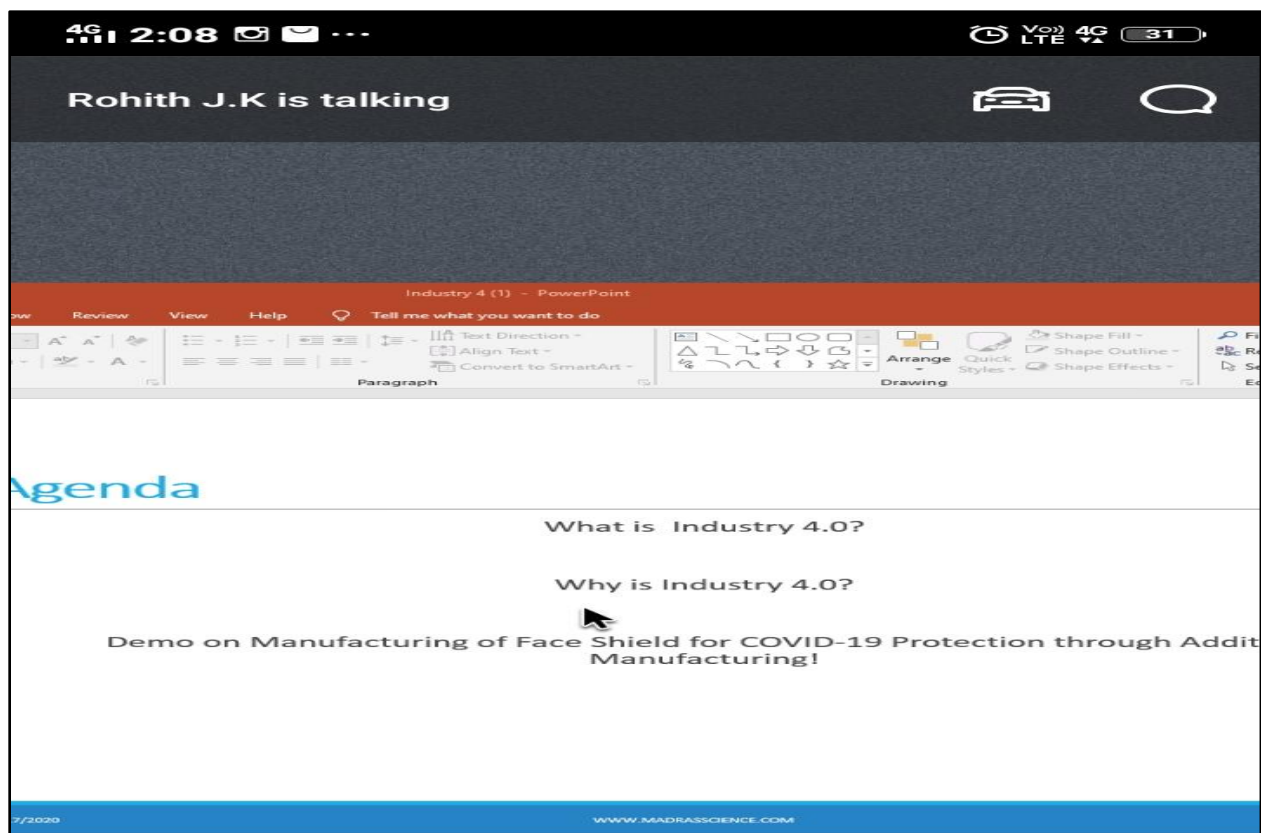
STTP on Internet of Things – Everything Future: Mr.J.K.Rohith, Director, Madras Scientific Research Foundation, Chennai shows the live demo on Manufacturing of face shield.

Day-5 (11.09.2020)

On Session 1 :

Topic : Industrial IoT challenges

Resource Person: Mr.S. Vijay Anand,
Director, aLTRAN, Chennai.

The Speaker of the Session 1, Mr.S. Vijay Anand presented topics related to Industrial IoT challenges. He projected a clear understanding of the importance of intelligent robots and future problems in the real world. He insisted that the transition to Industry 4.0 will depend on a successful adoption of many new technologies. He added to accelerate smart manufacturing, digital twins of machines and operations will be a necessity, as will factory automation and real-time control of equipment and tasks. He explained that Industry 4.0 will help make smart machines smarter, factories more efficient, processes less wasteful, production lines more flexible and productivity higher. He projected that having built on the foundation of smart, secure, wireless connectivity there are opportunities to extend machine life through predictive maintenance, support rapid material handling, monitor every detail of the shop floor, and leverage collaborative robots simultaneously with mobile communication. This will help factories

realize their goal of becoming a fully automated factory.
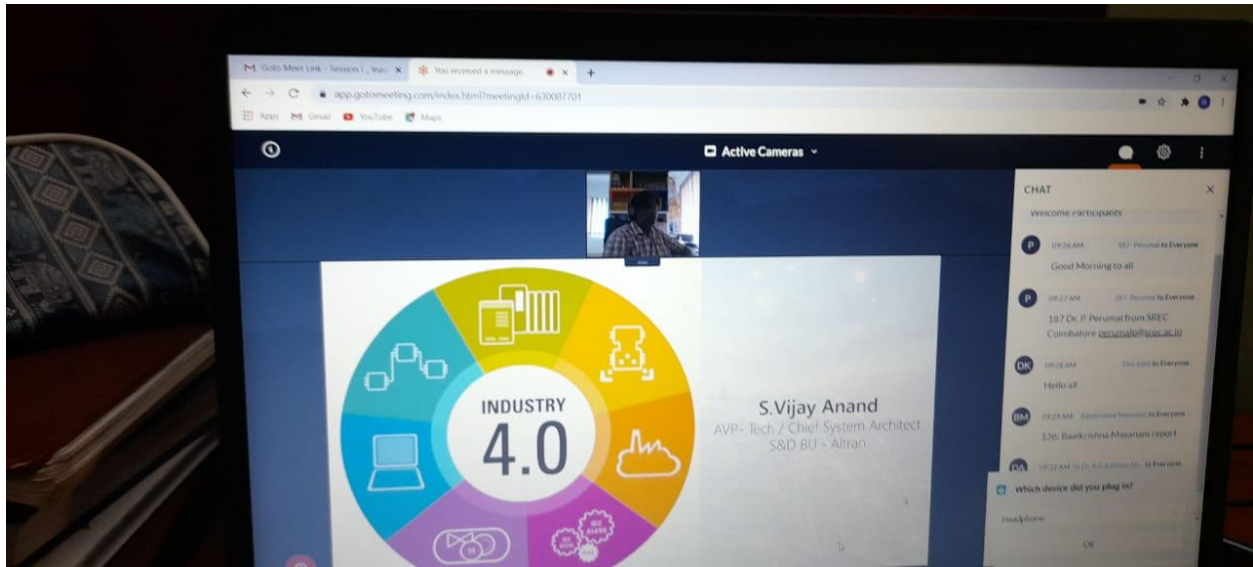
STTP on Internet of Things – Everything Future – Mr.Vijay Anand delivers the Industrial IoT challenges

On Session 2:

Topic : Applied Deep Learning for IoT Big Data and Streaming Analytics for Design Optimization of Electrical Vehicle

Resource Person : Mr.J.K.Rohith,
Director, Madras Scientific Research Foundation, Chennai.

The Speaker of the Session Mr.J.K.Rohith presented the topic related to Applied Deep Learning for IoT Big Data and Streaming Analytics for Design Optimization of Electrical Vehicle. In this presentation, he provides a thorough overview on using a class of advanced machine learning techniques, namely Deep Learning to facilitate the analytics and learning in the IoT domain. He explains the concept through two major treatments for IoT data from a machine learning perspective, namely IoT big data analytics and IoT streaming data analytics. He also discusses why deep learning is a promising approach to achieve the desired analytics in these types of data and applications. The smart IoT devices that have incorporated deep learning in their intelligence background are also discussed. The implementation of deep learning approaches on the fog and cloud centers in support of IoT applications are also analyzed.

On Session 3:

Topic : Hands on Session for IoT application using open source tool

Resource Person: Dr.Maheswari R,
Associate Professor, School of Computer Science and Engineering, VIT, Chennai.

The Speaker of the Session Dr.Maheswari presented topics related to Hands on Session for IoT application using open source tool. She explained with the tutorial which describes the potentialities of high-level programming and development of Internet of Things solutions and Smart Devices in Python through an open-source software suite. The presentation includes the description of the technical characteristics of the software, as well as an interactive hands-on.
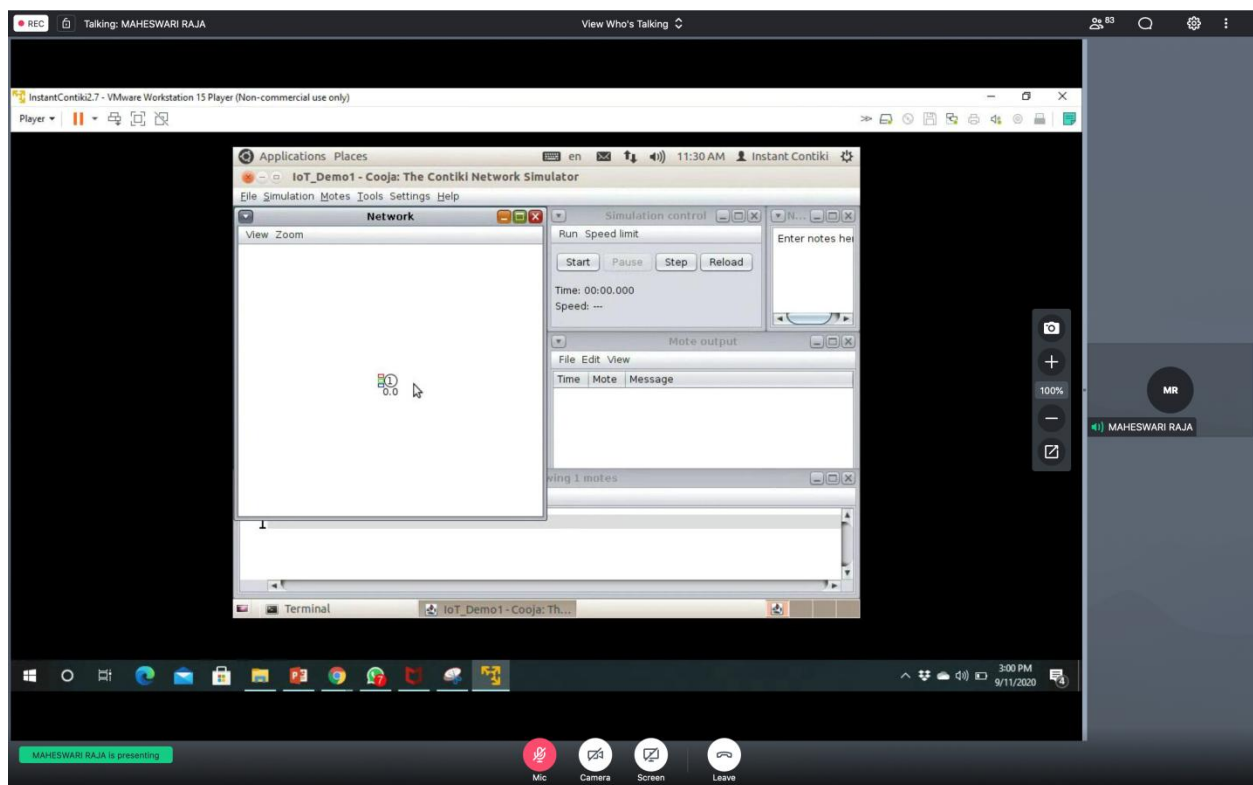
STTP on Internet of Things – Everything Future – Dr.Maheswari R gives hands on session for IoT application using open source tool.
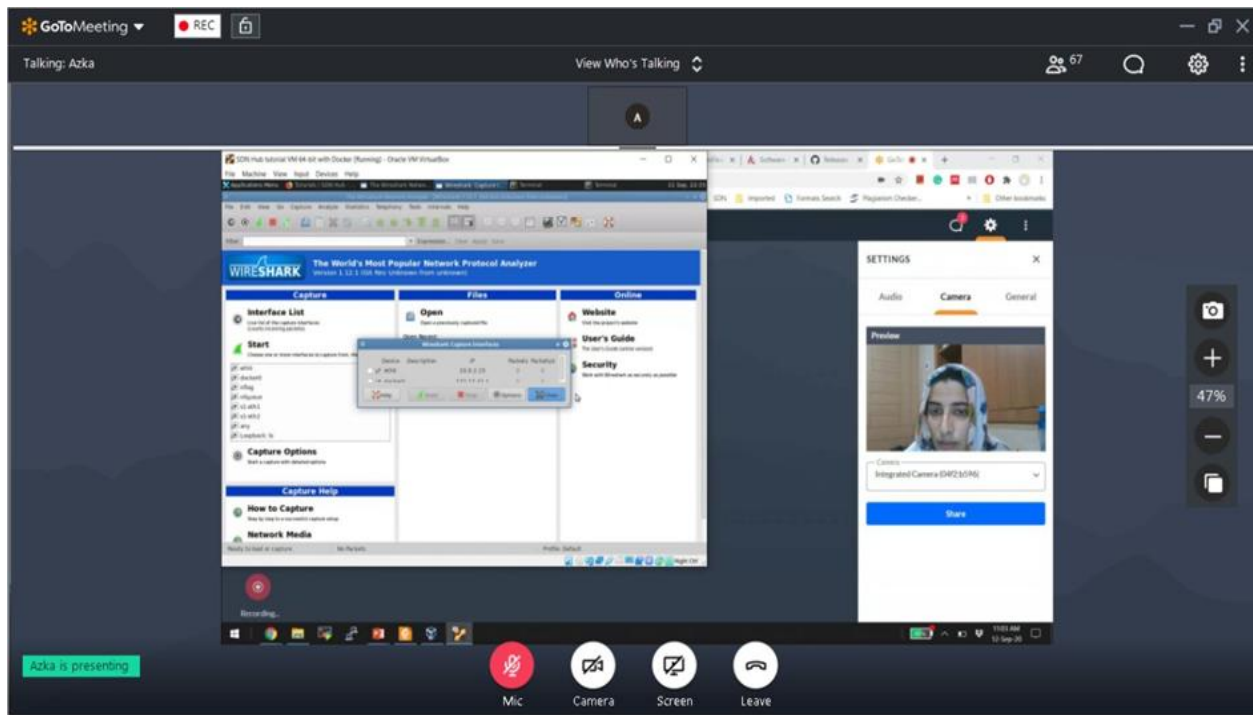
Day-6 (12.09.2020)

On Session 1:

Topic : Software Defined Networking(SDN) based IoT

Resource Person : Dr.Azka Wani,
Wani Systems, Dubai.

The Speaker of the Session Dr.Azka Wani presented topics related to "Software Defined

Networking(SDN) based IoT". She inspired the audience by explaining an environment where each object is having an unique identifier and has ability to transfer data over a network without the need of human-to-human or human-to-computer interaction. She discussed about the borderless system architecture which raises extra threat to the system access control. She emphasized on the new systems administration, the Software Defined Networking (SDN), offers numerous chances to secure the system in a more productive and adaptable way. She added that a SDN based model is also proposed for securing the IoT against the identified attacks. She described that the Security mechanism is contained in the control plane or Controller and the security policies are enforced in to the IoT gateways as flow rules.

STTP on Internet of Things – Everything Future: Dr.Azka Wani, Wani Systems, Dubai delivers the presentation on Software Defined Networking(SDN) based IoT.

On Session 2:

Topic: Block chain Technology and IoT

Resource Person: Mr.Manikandan,
Principal Systems Engineer, Aricent Technology, Chennai.

The Speaker of the Session Mr.Manikandan presented topics related to "Block chain

Technology and IoT. He explained how to work on assets –range from tangible to intangible, Chaincode – software for business logic, Ledger features, Privacy through channels, Security and membership services.

STTP on Internet of Things – Everything Future – Mr. Vijay Anand delivers the topic Block chain technology and IoT

Valedictory Session and Session 3:

Receiving an overwhelming response from participants, a week long short term training programme STTP on Internet of Things – Everything Future came to an end with the Valedictory Session. Dr. S. Revathi, Professor CSE Department, BSACIST explained the outcome of STTP Programme and introduced the chief guest of valedictory session Mr.Charan, Chief Marketing Officer (CMO), Mactrics Performing Arts, Chennai. He gave talk on the topic "Industrial IoT, the answer to Atmanirbhar Bharat". He pointed out the areas of development by explaining the cloud analytics, user applications and security. He explained the business model with necessary steps.
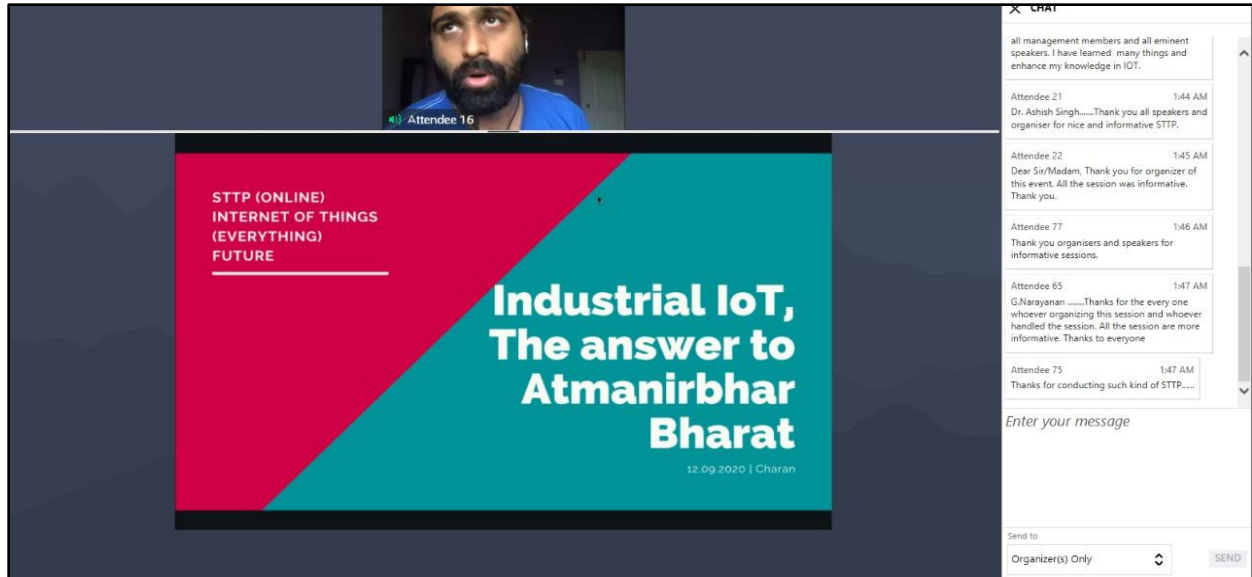
STTP on Internet of Things – Everything Future: Mr.Charan, Chief Marketing Officer (CMO), Mactrics Performing Arts, Chennai delivers the presentation on Industrial IoT, the answer to Atmanirbhar Bharat.

This distinctive user friendly programme cumulates together the real-world industry experience, practical hands-on session and exposed faculties and researchers to the Internet of Things. The technological update on this topic helped the institution in updating the curriculum according to the disciplines of subjects. B.Tech CSE with specialization in IoT educates the students about the effective use of Internet of Things (IoT) technology for solving real-life multi-disciplinary problems that cater to the need of society and are economically feasible.

The oral feedback received from the audience and online link was posted for collecting the participants' observation/feedback which is critical in improving the quality of the future session. Vote of Thanks was delivered by Dr.E.Syed Mohamed, Professor & HOD, CSE Department, BSACIST, in which he paid his gratitude towards all the dignitaries who has spared their time to share their expertise with the participants. Nevertheless, he has given thanks to AICTE for their continuous support and financial assistance to successfully organize this short term training programme.

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