

**Sarvajanik College of Engineering and Technology**  
**Department of Computer Engineering**



**GUJCOST-DST Sponsored 3-Days Workshop**  
**on**  
**“Recent Applications and Future Scope in Internet of Things”**

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**Objectives of the Workshop:**

- To acquire knowledge about the different aspects and applications of Internet of Things.
- To understand how the Internet of Things (IoT) can be applicable to various case studies.
- To study the various important challenges of IoT including cloud computing and data analytics for IoT.
- With a broad understanding of the meaning and importance of IoT to the development of our societies, to make the participants able to develop and improve IoT applications by an extended use of investigative hands-on.
- To provide research directions to students and teachers in the field of Internet of Things.

**Dates & Days:** 2-4 August, 2018 (Thursday, Friday and Saturday).

**Time :** 09.30 am to 5.15 pm daily.

**Venue:** Seminar Hall, 1<sup>st</sup> Floor, Department of Electronics and Communication, SCET

**Speakers:**

- Prof. (Dr.) Mayuri Mehta, SCET, Surat
- Prof. (Dr.) Vijay Ukani, Nirma University, Ahmedabad
- Prof. (Dr.) Ritesh Patel, CSPIT, Changa
- Prof. Jignesh Patoliya, CSPIT, Changa
- Prof. (Dr.) Pariza Kamboj, SCET, Surat
- Mr. J. Sathish Kumar, Research Scholar, SVNIT, Surat
- Mr. Saurabh K. Pandey, Research Scholar, SVNIT, Surat

**Participants:** 77 faculty members and students from Computer Engineering, Information & Technology Engineering, Electronics & Communication Engineering, Instrumentation & Control Engineering, Physics Department, M.Sc.(IT) and MCA participated in the workshop. They were from various Engineering colleges across South Gujarat region.

**Coordinator:** Prof. (Dr.) Mayuri Mehta, Department of Computer Engineering.

**Members of Organizing Committee:**

Prof. Jaydeep Gheewala  
Prof. Jayesh Chaudhary  
Prof. Fagun Vankawala  
Mrs. Urvashi Mistry

## Summary:

Department of Computer Engineering of Sarvajanic College of Engineering and Technology organized GUJCOST-DST sponsored 3-days workshop on “Recent Applications and Future Scope of Internet of Things” from 2<sup>nd</sup> to 4<sup>th</sup> August, 2018.

The workshop was aimed to guide the students and faculty members to excel in research and professional activities in the field of Internet of Things and thereby, to improve on technology transfer. The lectures and lab sessions of the workshop were conducted by eminent speakers from different disciplines of academia. The following table summarizes the various sessions of the workshop.

Sr. No.	Speaker Name and Session Title	Session Details
1.	<b>Prof. (Dr.) Mayuri Mehta</b> Internet of Things: Introduction, Applications and Future Scope	Prof. Mayuri Mehta discussed about what is IoT, where and when it was born, IoT hardware and software and its key features. She also discussed the diversified applications of IoT. Further she gave a good insight on data processing in IoT and Future Scope of IoT.
2.	<b>Prof. (Dr.) Vijay Ukani</b> 1. IoT Protocol Architecture 2. Application Development using Standard Protocols	Dr. Ukani mainly addressed two standard protocols: Message Queue Telemetry Transport (MQTT) and Constrained Application Protocol (CoAP). He discussed how MQTT works, what are its key features, architecture and applications. He explained that CoAP is document transfer protocol that is designed for the needs of constrained devices. He also discussed CoAP architecture and applications. Finally, he concluded with the brief discussion on comparison between MQTT and CoAP.
3.	<b>Prof. (Dr.) Pariza Kamboj</b> IoT using Netsim	In this session, Prof. Pariza Kamboj demonstrated IoT using Netsim which is a Graphical User Interface based simulator. Netsim has several advantages over other Simulators. Ma'am discussed the characteristics of IoT devices, their main components and IoT Technology Operational Model. She also discussed Superframe Architecture, 6lowPAN Gateway, what are simulators, their features and difference between simulator and emulator.
4.	<b>Prof. (Dr.) Ritesh Patel</b> 1. Smart Systems using IoT: Case Studies 2. Simulation of Smart System using Packet Tracer	Dr. Ritesh Patel discussed how to create Smart System using IoT. First he introduced and differentiated terminologies such as Cluster Computing, Grid Computing, Cloud Computing and High Performance Computing. Subsequently he showed various examples where IoT can be used to make our life better. He discussed real time example such as Barcelona Smart City which is having smart parking, smart gardening, etc. and Smart Home. In his second session on Simulation of Smart System using Packet Tracer, he introduced Packet Tracer that allows users to create network topologies and to initiate modern computer networks. He discussed different key features of Packet tracer and its working. By the end of the session, all the participants were able to create different topologies using Packet Tracer.
5.	<b>Mr. J Sathish Kumar</b>	In this session on Cooja (an open source simulator), hands-on

	Cooja Installation and Basics	practices were done on the basics and the installation of Cooja exploring various features of it. Participants learned that contiki is an operating system with a focus on low power IoT device and Cooja is the contiki network simulator. Ways to compute the performance metrics of IoT based Smart Devices were also discussed to understand the working of IoT based compression and routing protocols.
6.	<b>Mr. Saurabh K Pandey</b> Experiments using Cooja	
7.	<b>Prof. Jignesh Patoliya</b> 1. Embedded IoT Devices & Sensors 2. Experimenting with NodeMCU / ESP32 3. IoT Cloud Platforms: ThingSpeak & Ubidots 4. IoT using Visual Programming: NodeRed	During his first session, Prof. Jignesh addressed different applications, services of IoT, different layers, different ways of transmission in IoT, different types of Sensors and Actuators.  In subsequent sessions, he discussed plethora of information on different development boards such as Arduino, Node MCU, ESP32 and their structure, use, different components, applications, advantages and disadvantages. Participants learned different techniques to use these boards, various platforms, importance and comparison between all of them. The hands-on was mainly on the IoT cloud platforms such as Thingspeak and Ubidots, and on the IoT using Visual Programming like Nodered. Participants performed various practicals using NodeMCU by coding in ArduinoId. They also learned its applications, future scope, its use in academics to make useful projects that solve the problems of society and an individual.

I would like to extend my sincere gratitude to Sarvajanic Education Society and Sarvajanic College of Engineering and Technology for permitting me to submit workshop proposal to GUJCOST and subsequently providing necessary infrastructure for conducting the workshop after receiving workshop approval from GUJCOST. I am sincerely thankful to GUJCOST for sponsoring the workshop.

I am thankful to Dr. Vaishali Mungurwadi, Principal, SCET for her continuous guidance and motivation in organizing such events. I extend my gratitude to Mr. Bhaskar Cheruku, Registrar for his continuous positive and prompt support. I also thank Prof. (Dr.) Keyur Rana, HOD, Department of Computer Engineering for his constant support.

I extend my earnest gratitude to all the eminent speakers who traveled long distance and spare their valuable time. All the sessions were highly educative and with deep insights. We received very good feedback about all the speakers and about the contents of the sessions.

I would like to express my deep gratefulness to members of organizing committee (Prof. Jaydeep Gheewala, Prof. Jayesh Chaudhary, Prof. Fagun Vankawala and Mrs. Urvashi Mistry) for their relentless help and support without which it would have been difficult to conduct the workshop smoothly.

I thank Prof. (Dr.) Maulin Joshi, HOD, EC Department for permitting use of Seminar Hall and Prof. Gayatri Kapadia, HOD, MCA Department for permitting use of MCA lab for hands-on sessions. I also thank Mrs. Tejal Surti and Piyushbhai from MCA department for their unconditional help in lab preparation and during hands-on sessions too. I deeply appreciate the support extended by all the student volunteers (Vishal Jobanputra, Puwar Mahitoshsinh, Harsh, Tejswini and Nancy) for their assistance in publicizing the workshop, preparing the lab, capturing photos, presenting vote of thanks to speakers, certificate writing, feedback form preparation, etc.

My sincere thanks to all staff members of CO department to help in all the possible ways whenever required. I am also thankful to lab attendants for being always ready for any kind of work. Last but not the least, I am very thankful to all the participants for your kind presence during the workshop.

Following are some glimpses of the workshop.

