

- ❖ Gain skills for designing cybermatics and the implementation of their applications, protocols and Cyber security mechanisms to manage and to control at different scales of systems, from local to global.
- ❖ Acquire practical skills on latest tools and technologies and applications to combat security issues in Internet, IoT, Cyber physical and social systems.

The inaugural function of the online FDP is scheduled on August 23, 2021 at 9:00 AM. In the inaugural function, **Ms. C. Silpa**, Assistant Professor, Department of Information Technology welcomed the dignitaries and all the participants to the online FDP. The event is started with a prayer song followed by a welcome speech by the coordinator.

Dr. V. Jyothsna, Coordinator of ATAL FDP welcomed the chief guest, the participants and thanked the ATAL academy for sponsoring the FDP. Further, the coordinator highlighted the objective and motivation of the FDP, the topics to be discussed and the outcomes of the FDP. Later, **Dr. B. M. Satish**, Principal, SVEC and **Dr. K. Ramani**, Head and Professor, Department of Information Technology, SVEC enlightened the participants regarding the fast development of new cyber threats and numerous information security issues which are exploited by cyber criminals.



Dr. V. Jyothsna, Coordinator of ATAL FDP is giving the welcome speech.

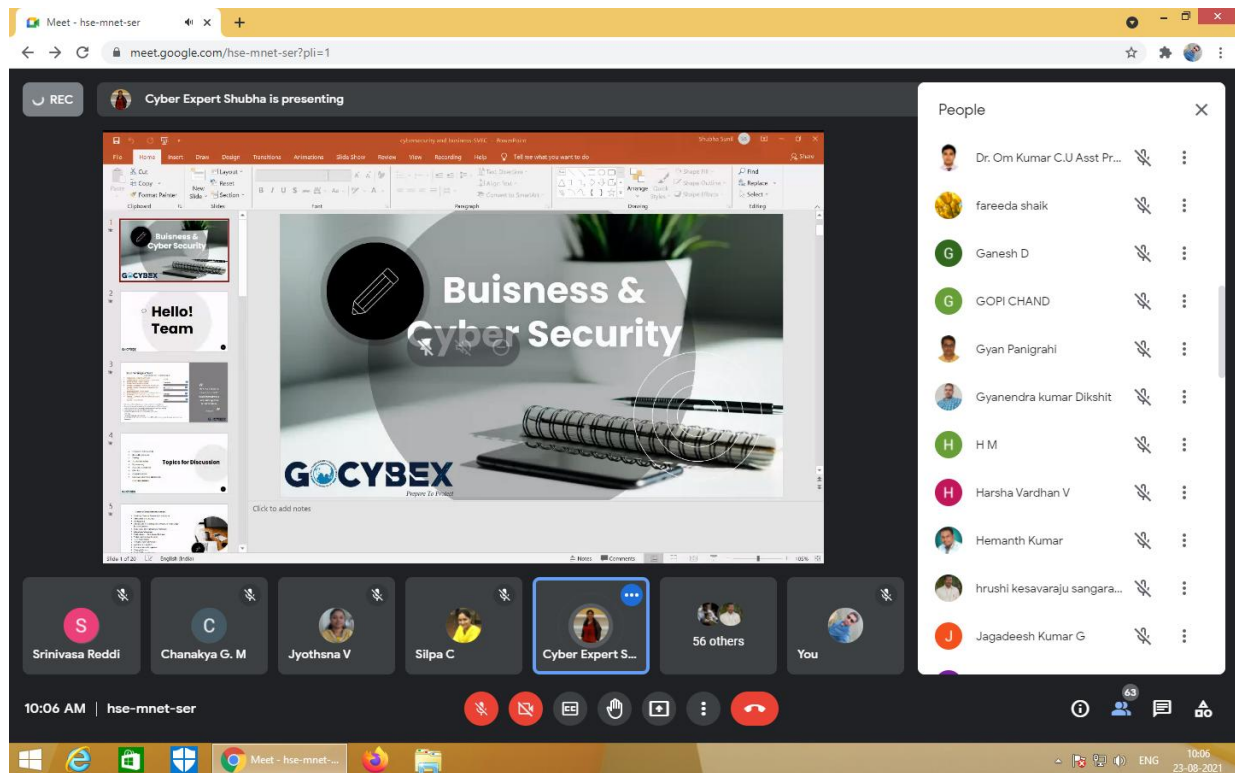


Dr. B. M. Satish, Principal, SVEC addressing the participants

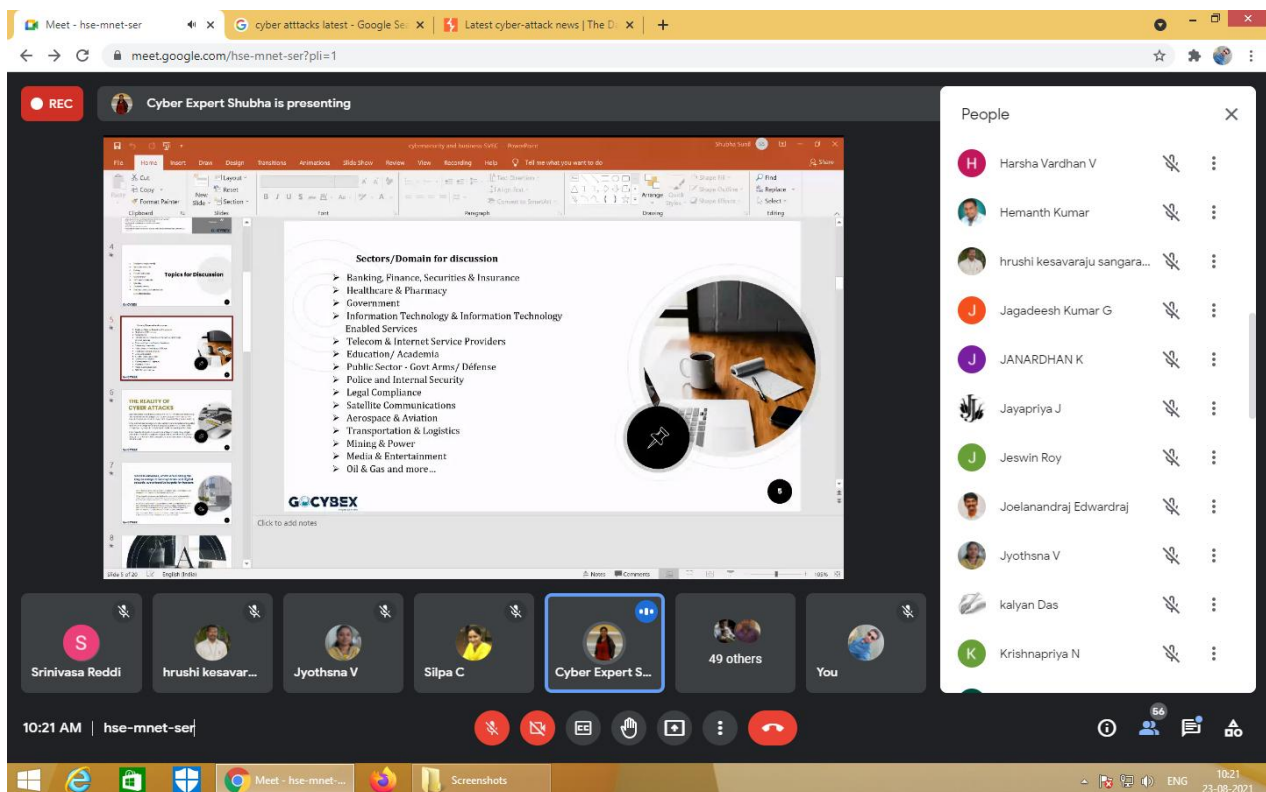
August 23, 2021 (Day – 1, Session – 1)

Smt. Shubhamangala Sunil, Founder and Director, Global Cyber Security Response Team (GCSRT), Bengaluru acted as a resource person for the first two sessions of Day-1 to deliver the fundamental concepts of cyber security. The first session of Day-1 was started at 09:30 AM. The participants are trained on the following concepts :

- Cyberspace operations
- Securely interconnected cyber systems (firewalls, cross-domain security solutions)
- Self-securing and self-defending cyber systems
- Business and cyber security



Smt. Shubhamangala Sunil is explaining Business and cyber security.

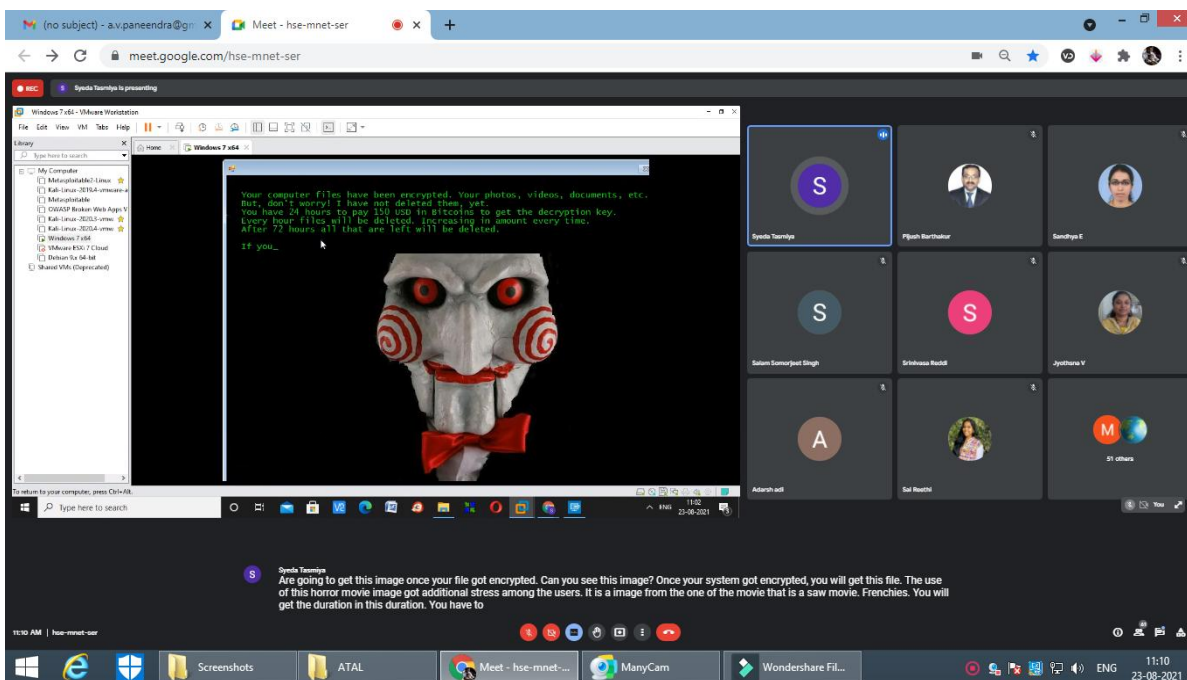


Smt. Shubhamangala Sunil is explaining the domain needed security

August 23, 2021 (Day – 1, Session – 2)

The second session of Day-1 was started at 11:30 AM. In this session, **Smt. Shubhamangala Sunil** explained the Social engineering. The participants were introduced with the practical examples of the following concepts:

- Social engineering
- Security technologies for protecting cyber systems and devices
- Ransomware attack



Smt. Shubhamangala Sunil demonstrating the hand-on for encrypting the files

August 23, 2021 (Day – 1, Session – 3)

The final session of Day-1 started at 2:30 PM. In this session, **Dr. Bipin Kumar Rai** Professor & Head (Information Technology), ABES Institute of Technology, Ghaziabad explained Potential of Block chain technologies for privacy and security of Social network use cases. The participants have gained the practical knowledge on the following concepts.

- Blockchain foundations
- Blockchain architecture
- Blockchain security
- Blockchain privacy
- Hyperledger, Ethereum

Blockchain Use Cases from Industry

Financial Services	Public Sector	Retail	Insurance	Supply Chain & Logistics
<ul style="list-style-type: none"> Trade Finance Cross currency payments Mortgages KYC Cross border tax 	<ul style="list-style-type: none"> Asset Registration Citizen Identity Medical records Medicine supply chain 	<ul style="list-style-type: none"> Supply chain Loyalty programs Information sharing (supplier – retailer) 	<ul style="list-style-type: none"> Claims processing Risk provenance Asset usage history Claims file 	<ul style="list-style-type: none"> Supply chain finance Maintenance tracking Provenance Supply chain compliance

Dr. Bipin Kumar Rai is explaining the use cases.

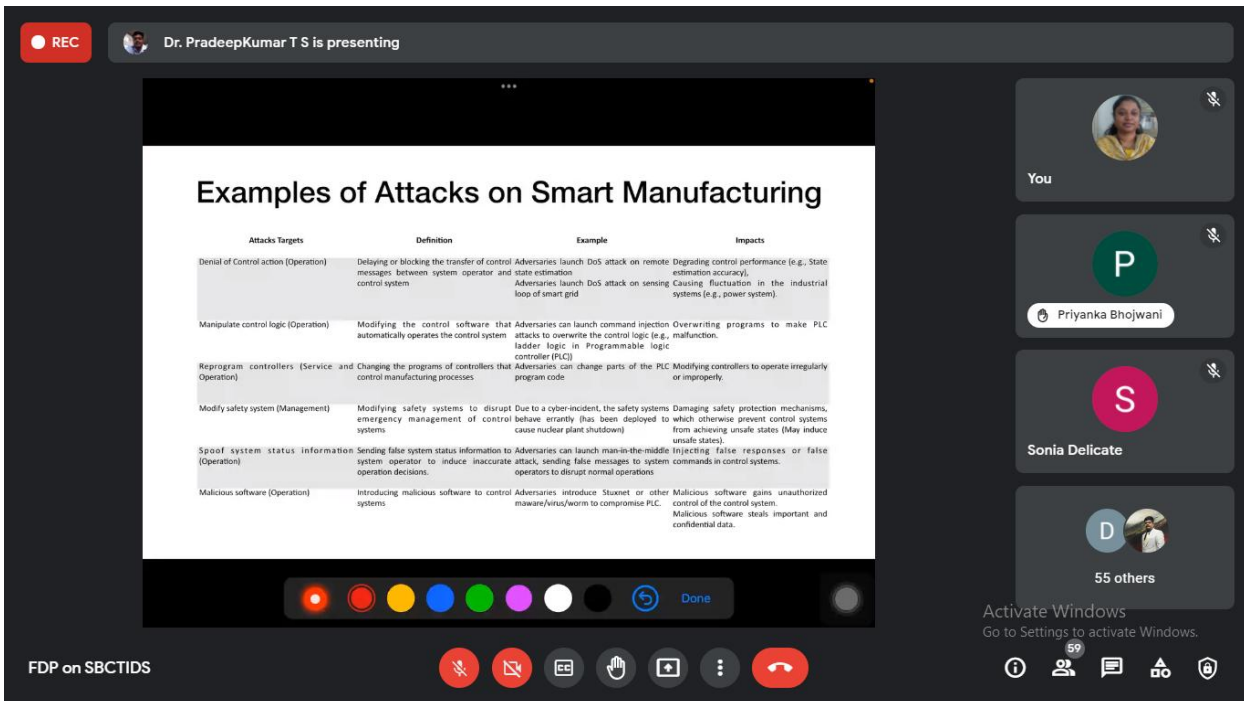
August 24, 2021 (Day – 2, Session – 1)

Dr. Pradeep Kumar T S, Associate Professor, VIT University, Chennai acted as a resource person for all the three sessions of Day-2. **Ms. C. Silpa**, Assistant Professor, Department of IT introduced **Dr. Pradeep Kumar T S** to the participants. **Dr. Pradeep Kumar T S** has conducted the sessions on Cyber Infrastructure. The first session of Day-2 was started at 9:30 AM. In this session, **Dr. Pradeep Kumar** explained the implementation of Cyber Infrastructure. The participants have gained the practical knowledge on the following concepts.

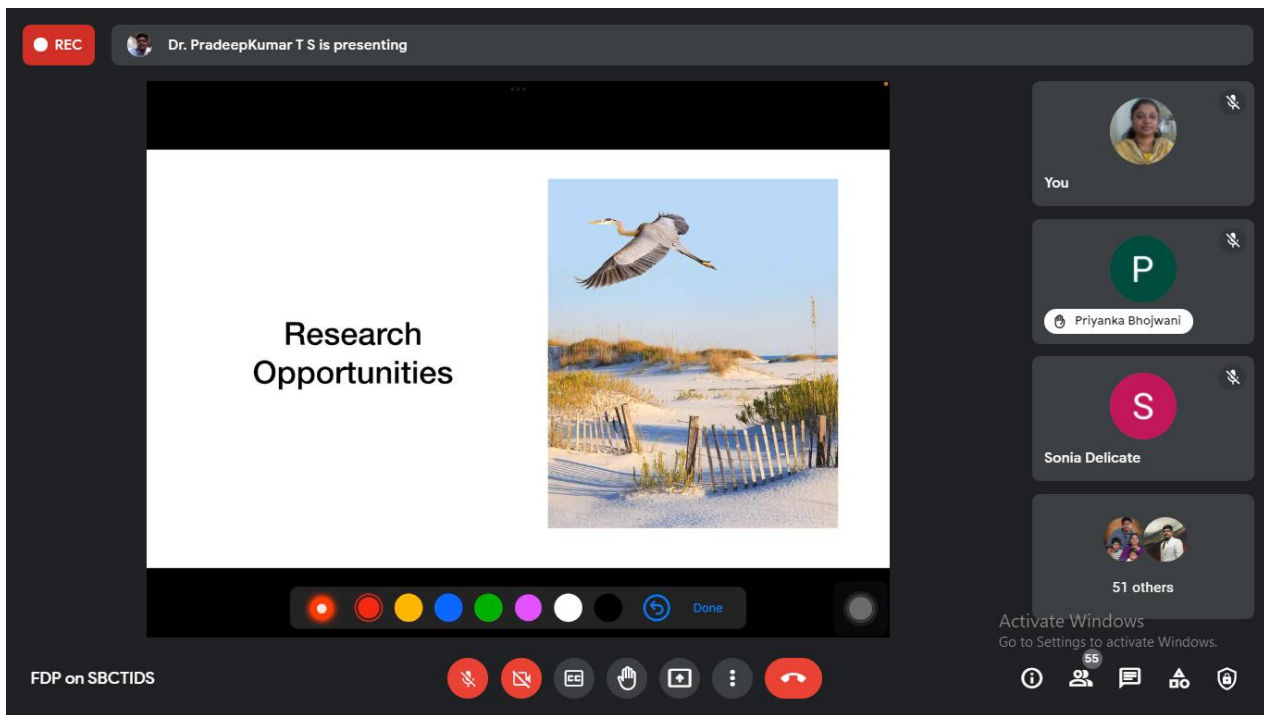
- Cyber-enabled critical infrastructure systems
- Cyber-physical systems and Internet of Things
- Special application domains such as smart grid, traffic management systems, autonomous driving, etc.



Dr. Pradeep Kumar T S, Associate Professor, VIT University, Chennai



Dr. Pradeep Kumar T S is explaining the different types of attacks.



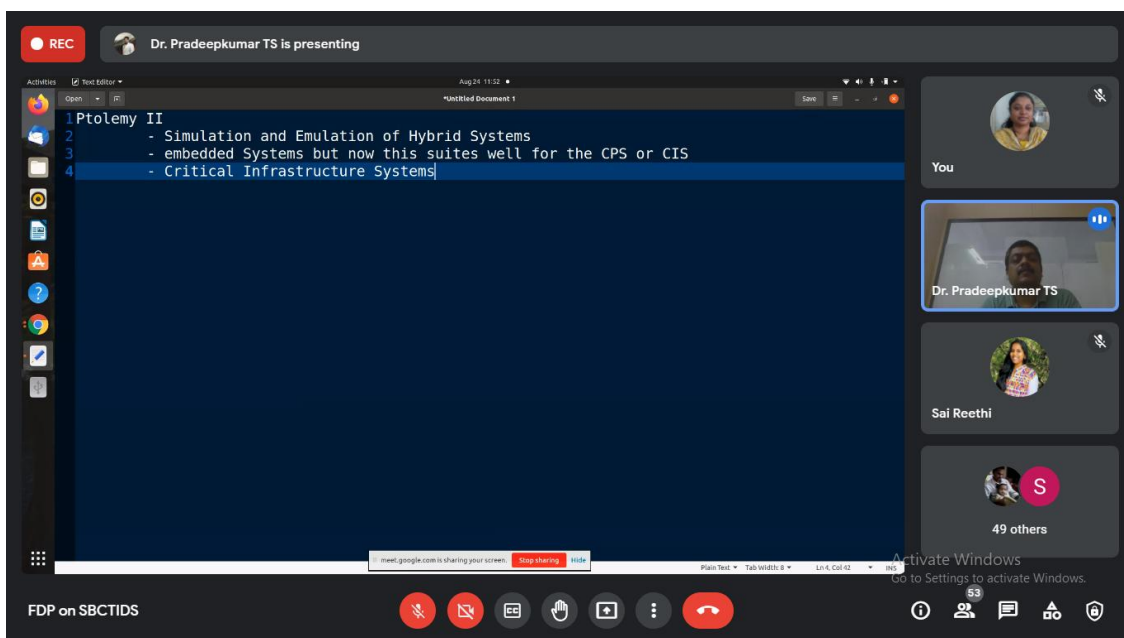
Dr. Pradeep Kumar T S is explaining the Research Opportunities

August 24, 2021 (Day – 2, Session – 2)

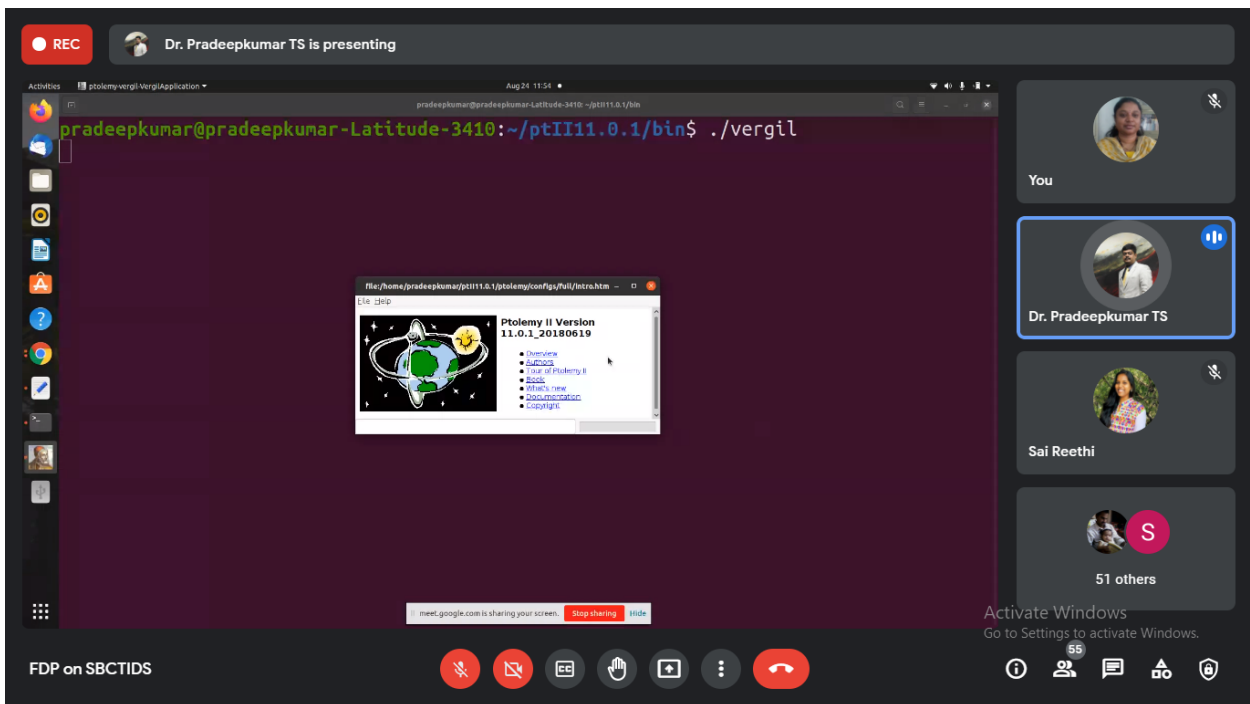
The second session of the Day-2 was started at 11.30 AM. In this session,

Dr. Pradeep Kumar T S has demonstrated the following topics:

- Cyber Resilience and its simulations
- Cyber Cities and Cyber Environments.
- Ptolemy II - Simulation of Hybrid system



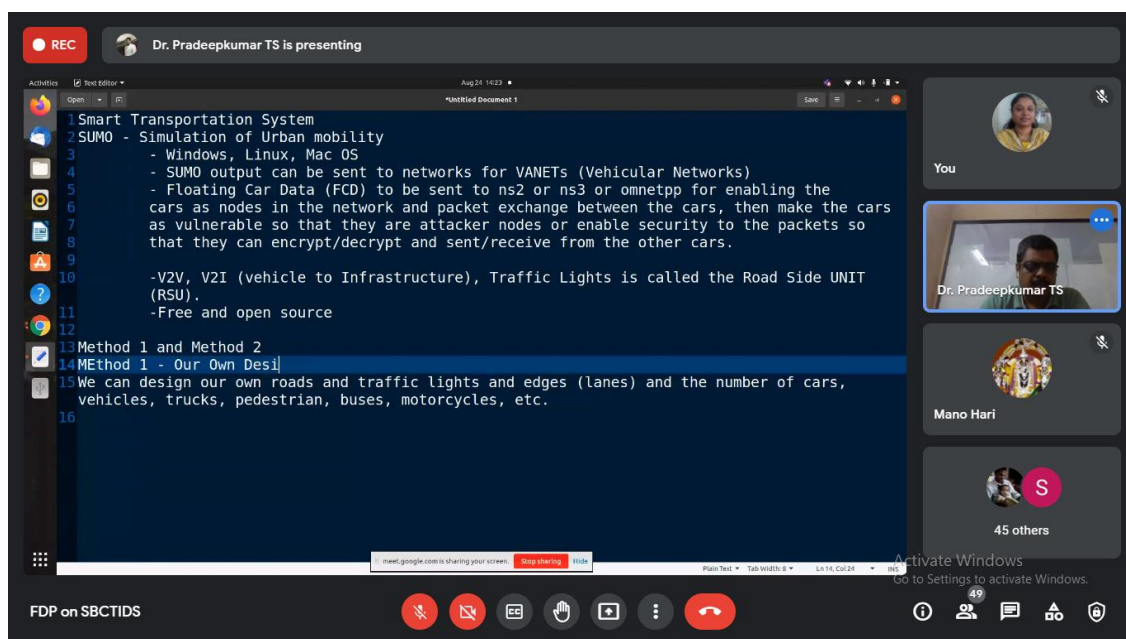
Dr. Pradeep Kumar T S simulating the Cyber Physical Systems



Dr. Pradeep Kumar T S is Demonstrating Ptolemy II - Simulation of Hybrid system

August 24, 2021 (Day – 2, Session – 3)

In this session, **Dr. Pradeep Kumar T S** delivered practical simulation of Urban mobility using SUMO tool for Cyber Resilience. He explained the various scenarios of traffic mobility and also the various parameters of each vehicle.

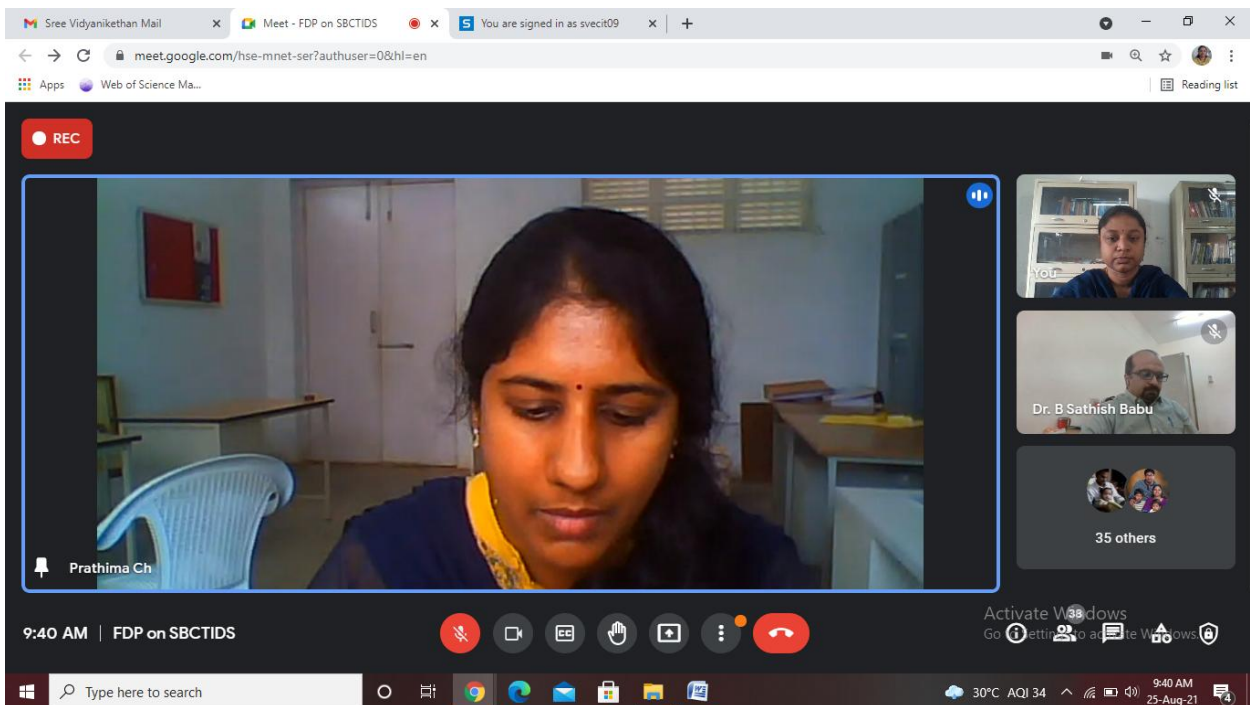


Dr. Pradeep Kumar T S is Demonstrating the SUMO tool

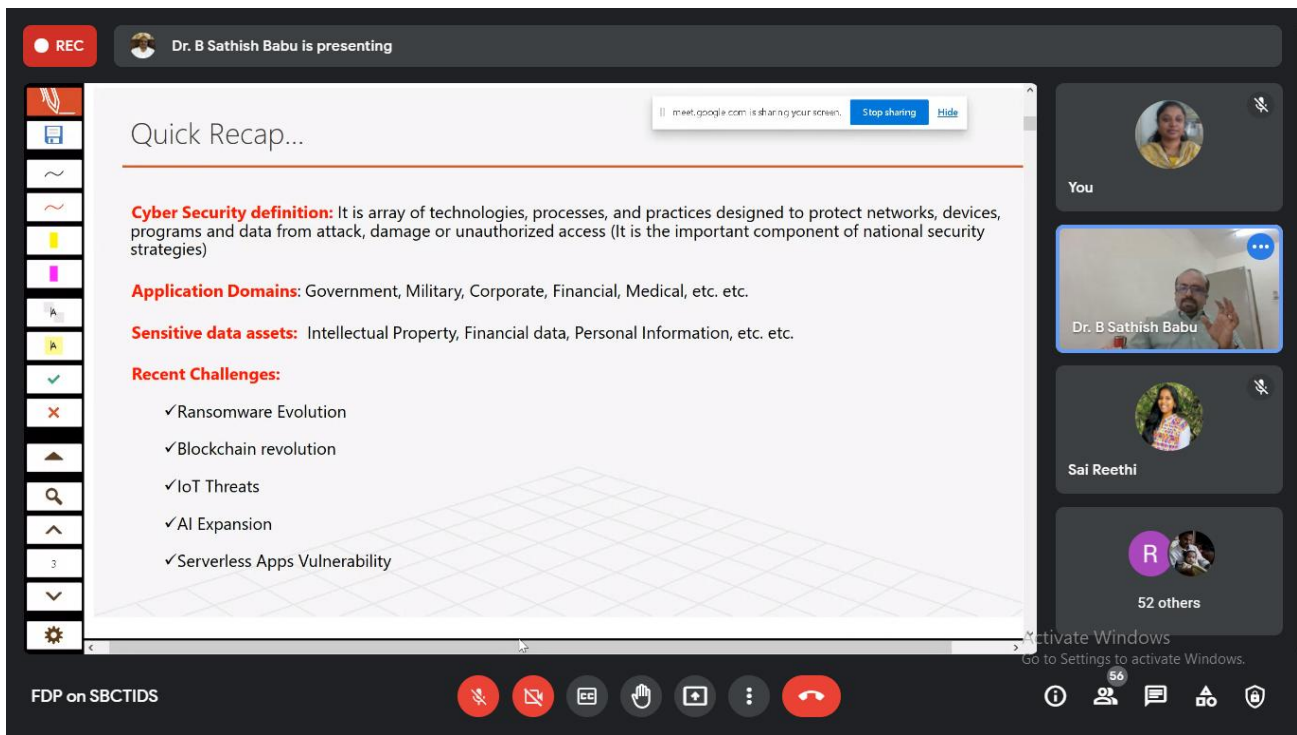
August 25, 2021 (Day – 3, Session – 1)

The first two sessions of the Day-3 was handled by **Dr. Sathish Babu B**, Professor, Dept. of Computer Science, R V College of Engineering, Bengaluru. The first session was started at 09.30 AM. **Ms. Prathima**, Assistant Professor, Department of IT introduced the resource person to the participants. He delivered a session on Intelligent Cyber Security Solutions. The participants have gained the knowledge on the following concepts:

- Attack vectors
- AI and adoption challenges
- Benefits of AI in cyber security
- AI in Cyber Security
- Use of ML in Cyber Security



Ms. Ch. Prathima introducing the resource person to the participants



The screenshot shows a Google Meet interface. At the top, it says "Dr. B Sathish Babu is presenting". The main content is a slide titled "Quick Recap..." with the following text:

- Cyber Security definition:** It is array of technologies, processes, and practices designed to protect networks, devices, programs and data from attack, damage or unauthorized access (It is the important component of national security strategies)
- Application Domains:** Government, Military, Corporate, Financial, Medical, etc. etc.
- Sensitive data assets:** Intellectual Property, Financial data, Personal Information, etc. etc.
- Recent Challenges:**
 - ✓ Ransomware Evolution
 - ✓ Blockchain revolution
 - ✓ IoT Threats
 - ✓ AI Expansion
 - ✓ Serverless Apps Vulnerability

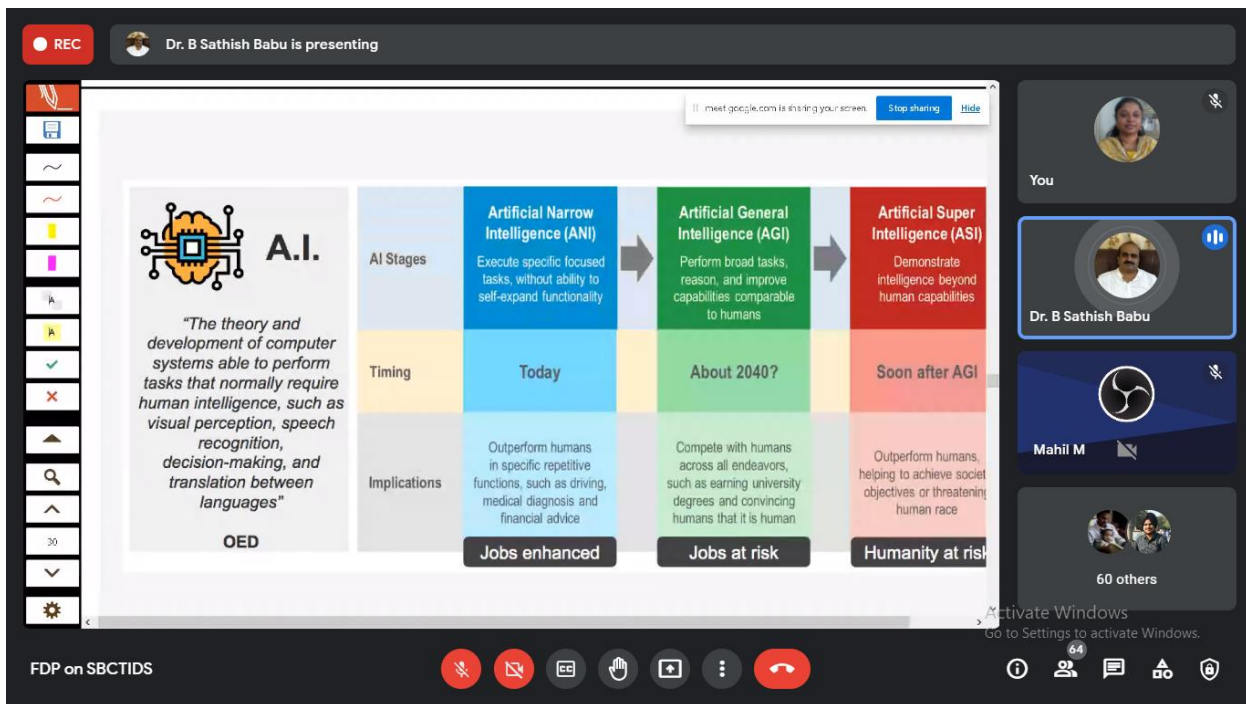
The slide also features a decorative diamond-patterned background at the bottom. The meeting controls at the bottom include a microphone icon, a video camera icon, a chat icon, a hand icon, a screen share icon, a settings icon, and a red end call button. The bottom left corner of the slide area says "FDP on SBCTIDS".

Dr. Sathish Babu B explaining the basic concepts

August 25, 2021 (Day – 3, Session – 2)

The second session of the Day-3 was started at 11.30 AM. He delivered a session on Cognitive theories and Cognitive Security. The participants have gained the knowledge on the following concepts:

- Cognitive computing and AI
- Cognitive Security?
- Next era of security
- Securing CPS
- Computational intelligence perspective
- Cognitive CPS



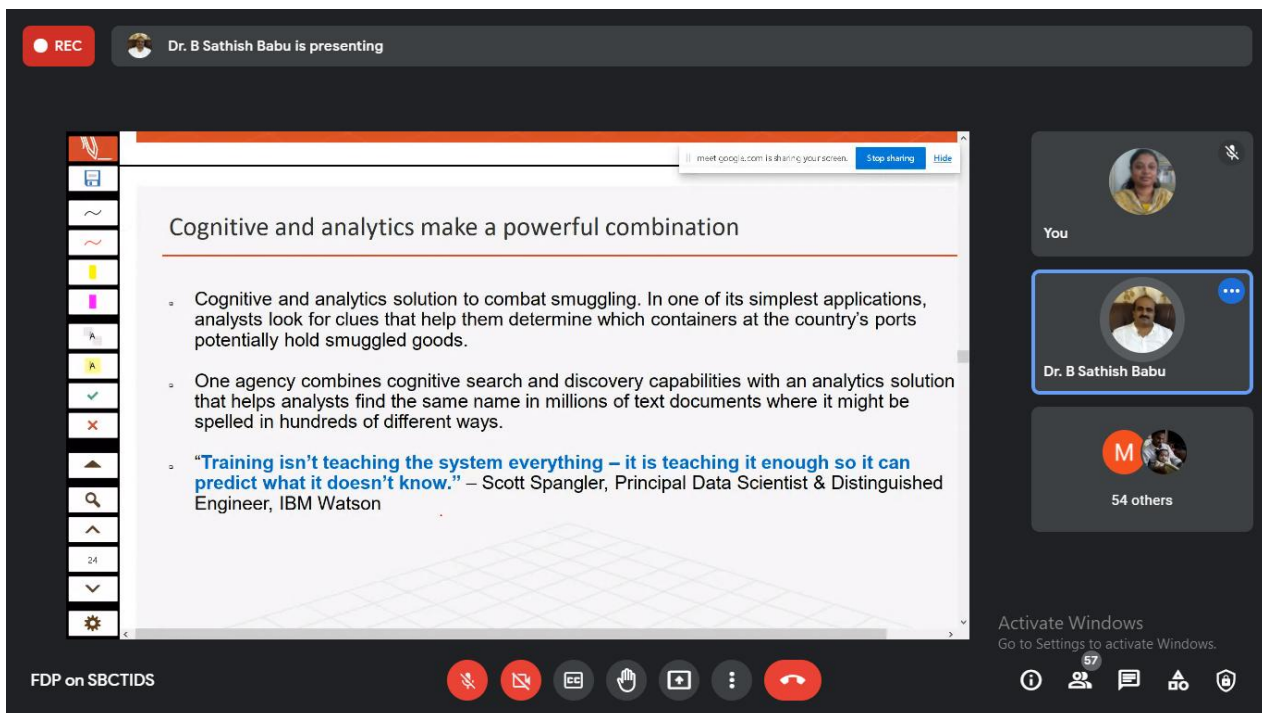
A.I.

"The theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages"

OED

AI Stages	Artificial Narrow Intelligence (ANI)	Artificial General Intelligence (AGI)	Artificial Super Intelligence (ASI)
Timing	Today	About 2040?	Soon after AGI
Implications	Outperform humans in specific repetitive functions, such as driving, medical diagnosis and financial advice	Compete with humans across all endeavors, such as earning university degrees and convincing humans that it is human	Outperform humans, helping to achieve societal objectives or threatening human race
	Jobs enhanced	Jobs at risk	Humanity at risk

Dr. Sathish Babu B explaining the basic concepts of Cognitive computing and AI



Cognitive and analytics make a powerful combination

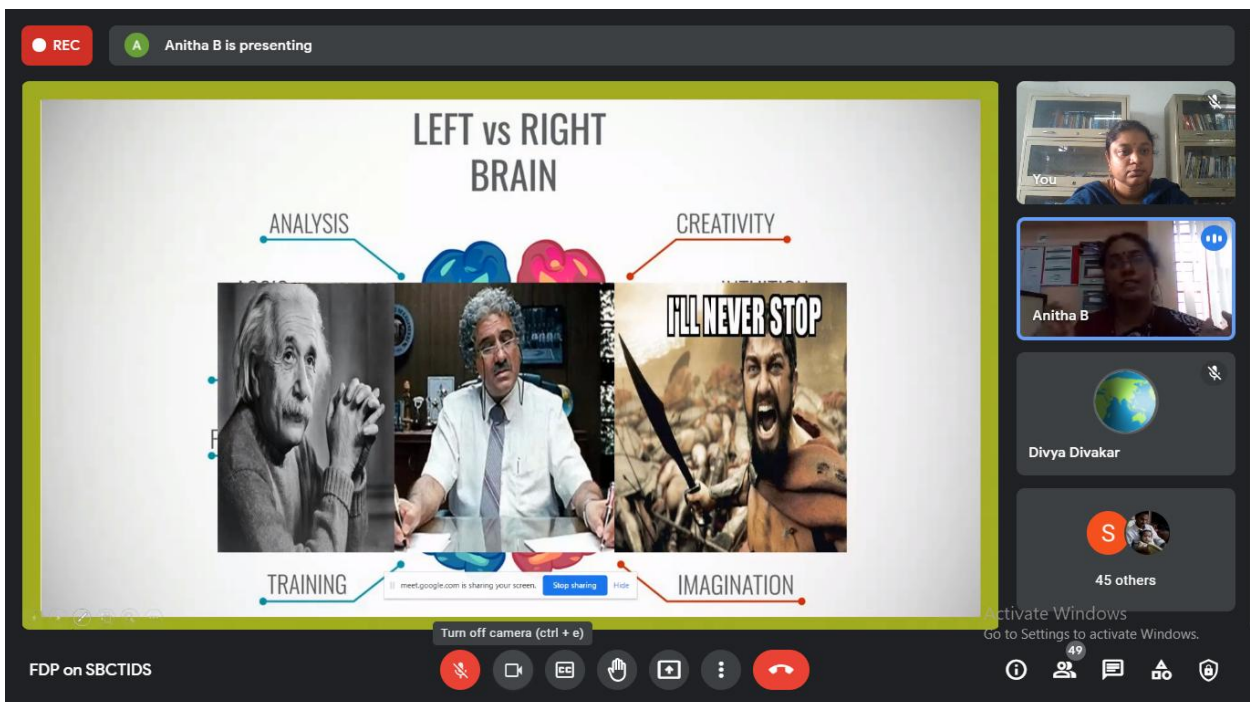
- Cognitive and analytics solution to combat smuggling. In one of its simplest applications, analysts look for clues that help them determine which containers at the country's ports potentially hold smuggled goods.
- One agency combines cognitive search and discovery capabilities with an analytics solution that helps analysts find the same name in millions of text documents where it might be spelled in hundreds of different ways.
- "Training isn't teaching the system everything – it is teaching it enough so it can predict what it doesn't know." – Scott Spangler, Principal Data Scientist & Distinguished Engineer, IBM Watson

Dr. Sathish Babu B explaining the Cognitive Analytics

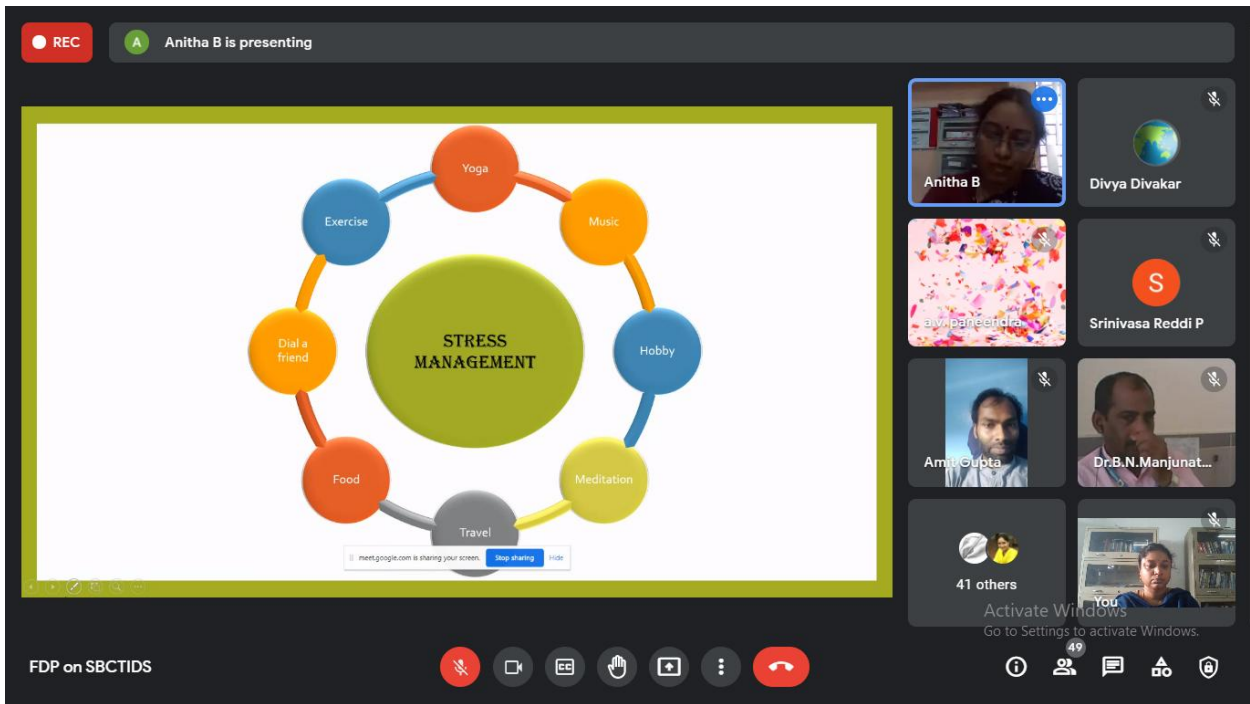
August 25, 2021 (Day – 3, Session – 3)

The last session of the Day-3 was started at 02:30 PM. As a part of FIT INDIA movement and to promote it across the country, the session on “**Decision Making and Stress Management**” is conducted. This session was delivered by **Dr. B. Anitha**, Assistant Professor (SL), Department of BS and H, Sree Vidyanikethan Engineering College (Autonomous), Tirupati. **Ms. C. Silpa**, Assistant Professor, Department of IT introduced the resource person to the participants. **Dr. B. Anitha** explained the following:

- Right mode of thinking
- Decision Making
- Stress management strategies include controlling thoughts, goal setting, time management, task priority and realistic deadline settings, regular exercises and relaxing techniques.



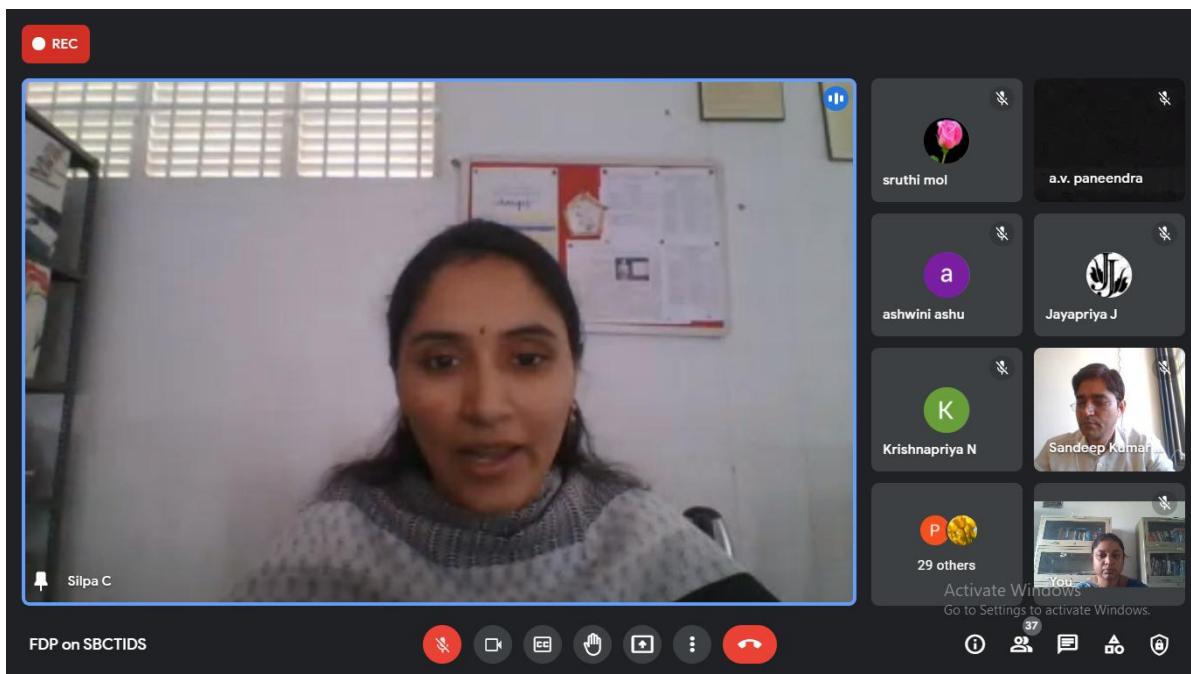
Dr. B. Anitha is explaining the Right mode of thinking.



Dr. B. Anitha is explaining stress management.

August 26, 2021 (Day – 4, Session – 1)

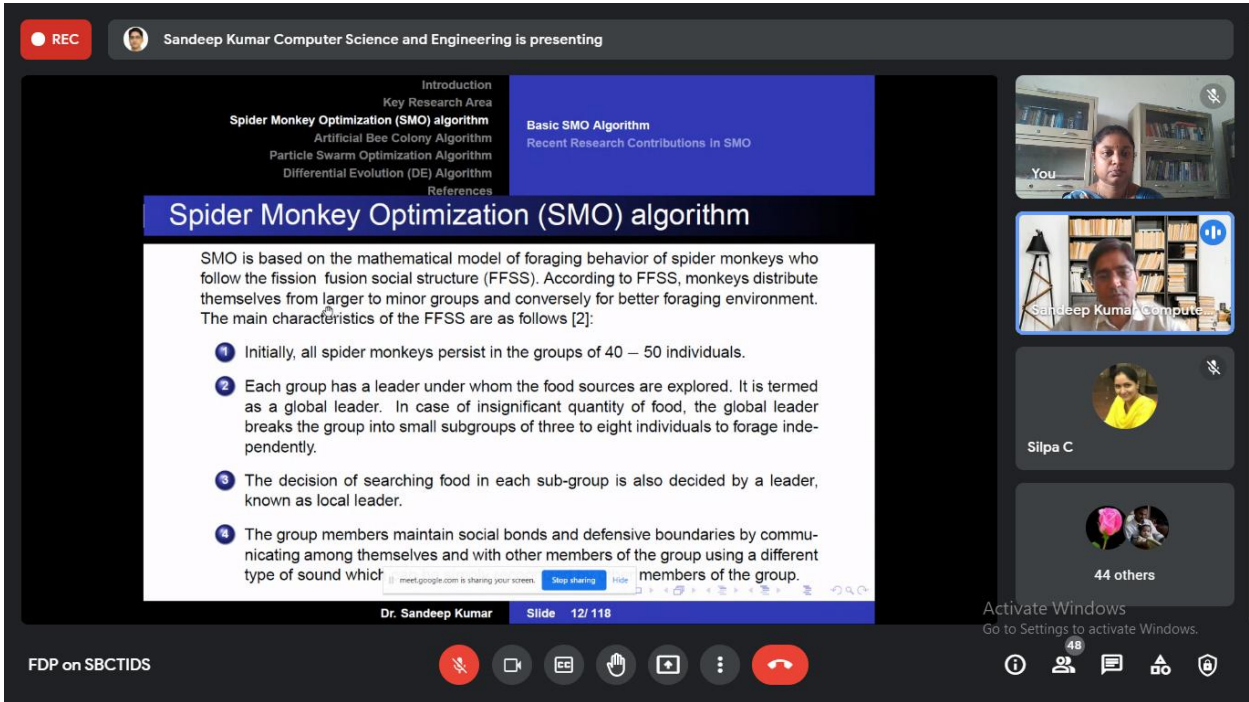
Dr. Sandeep Kumar, Associate Professor, CHIRST (Deemed to be University), Bangalore acted as a resource person for the first two sessions of Day-4. The first session of Day-4 was started at 9:30 AM. **Ms. C. Silpa**, Assistant Professor, Department of IT introduced the resource person to the participants.



Ms. C. Silpa introducing the resource person to the Participants

In this session, the participants have gained knowledge on the following:

- Spider monkey Optimization
- Artificial Bee Colony Algorithm



The screenshot shows a Zoom meeting interface. The main window displays a slide titled "Spider Monkey Optimization (SMO) algorithm". The slide content includes:

- Introduction**
- Key Research Area**
- Spider Monkey Optimization (SMO) algorithm**
- Artificial Bee Colony Algorithm**
- Particle Swarm Optimization Algorithm**
- Differential Evolution (DE) Algorithm**
- References**

The slide also features a table of contents:

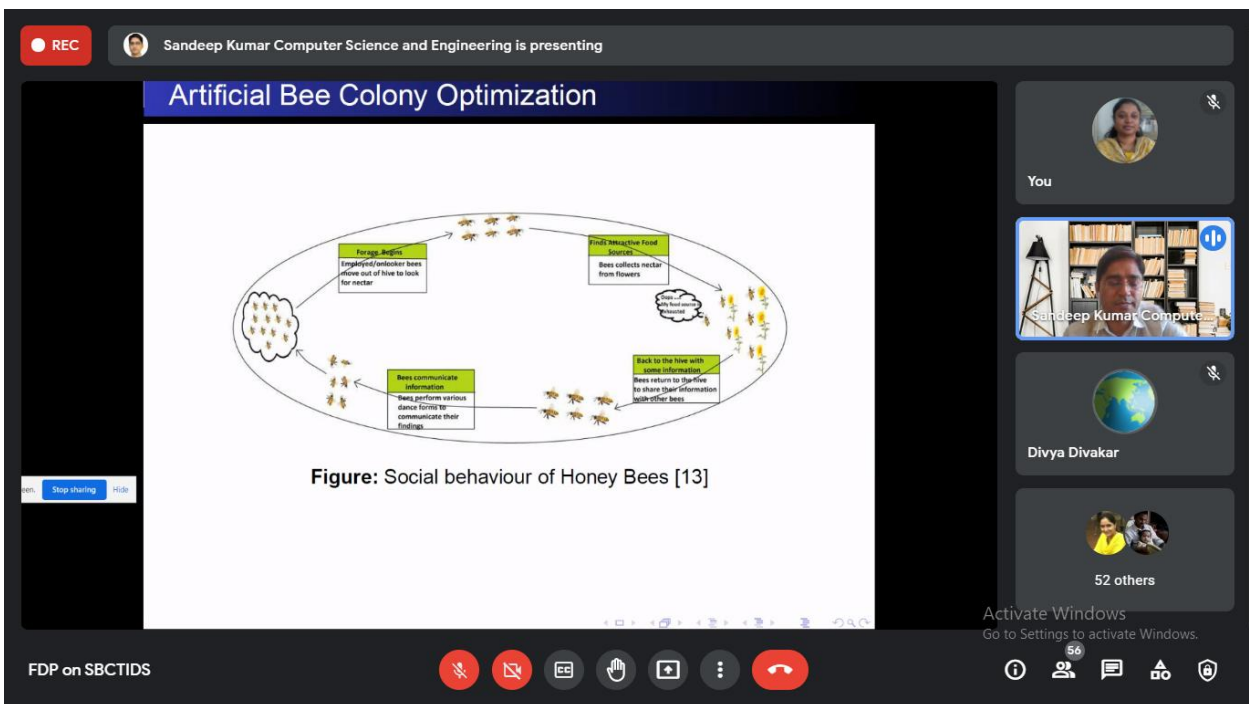
Introduction	Basic SMO Algorithm
Key Research Area	Recent Research Contributions In SMO

The main text on the slide reads: "SMO is based on the mathematical model of foraging behavior of spider monkeys who follow the fission fusion social structure (FFSS). According to FFSS, monkeys distribute themselves from larger to minor groups and conversely for better foraging environment. The main characteristics of the FFSS are as follows [2]:"

- Initially, all spider monkeys persist in the groups of 40 – 50 individuals.
- Each group has a leader under whom the food sources are explored. It is termed as a global leader. In case of insignificant quantity of food, the global leader breaks the group into small subgroups of three to eight individuals to forage independently.
- The decision of searching food in each sub-group is also decided by a leader, known as local leader.
- The group members maintain social bonds and defensive boundaries by communicating among themselves and with other members of the group using a different type of sound which

The meeting interface shows the presenter, Dr. Sandeep Kumar, and several other participants in a sidebar.

Dr. Sandeep Kumar explaining the Spider monkey Optimization Algorithm



The screenshot shows a Zoom meeting interface. The main window displays a slide titled "Artificial Bee Colony Optimization". The slide features a diagram illustrating the social behavior of honey bees:

- Forage Begins:** Employed forager bees leave out of hive to look for nectar.
- Find Attractive Food Sources:** Bees collect nectar from flowers.
- Back to the hive with some information:** Bees return to the hive to share their information with other bees.
- Bees communicate information:** Bees perform various dance foraging to communicate their findings.

The diagram shows bees moving from a hive to a field of flowers and back to the hive, with arrows indicating the flow of information and nectar.

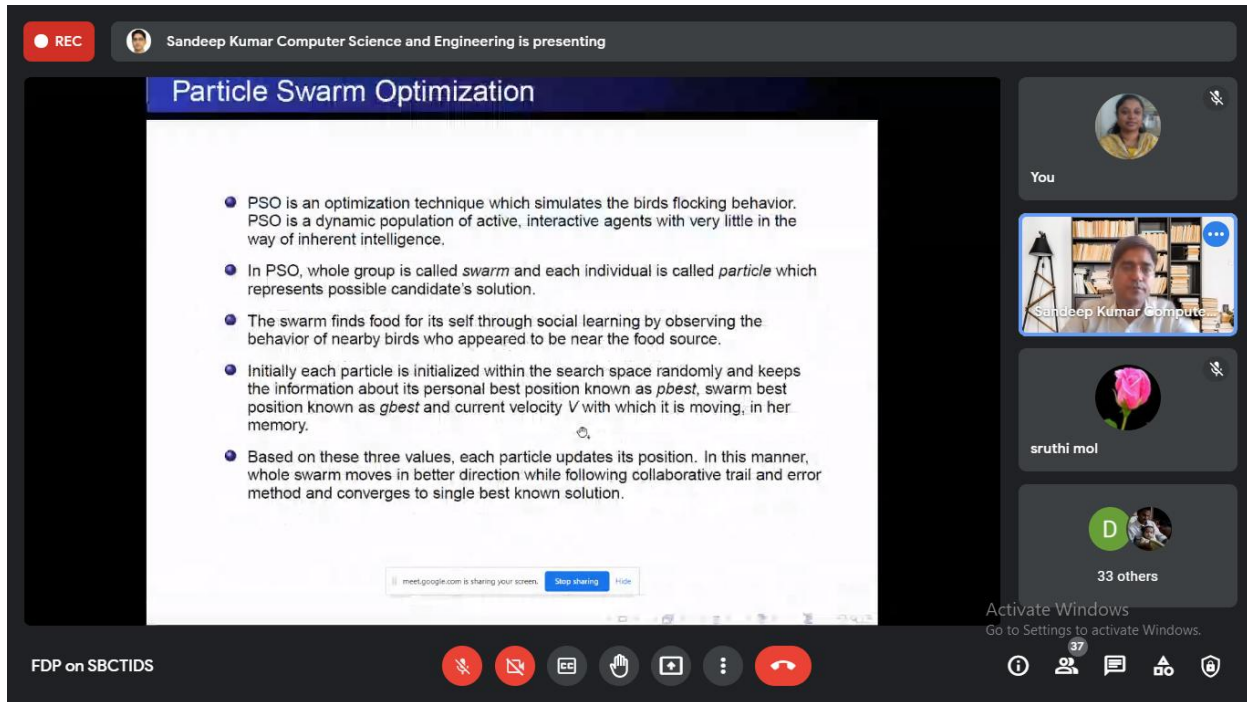
Figure: Social behaviour of Honey Bees [13]

The meeting interface shows the presenter, Dr. Sandeep Kumar, and several other participants in a sidebar.

Dr. Sandeep Kumar explaining the Artificial Bee Colony Optimization Algorithm

August 26, 2021 (Day – 4, Session – 2)

The session 2 of the Day-4 was started at 11:30 AM. In this session, the participants have got exposure on Differential Evolution and Particle swarm Optimization algorithms.

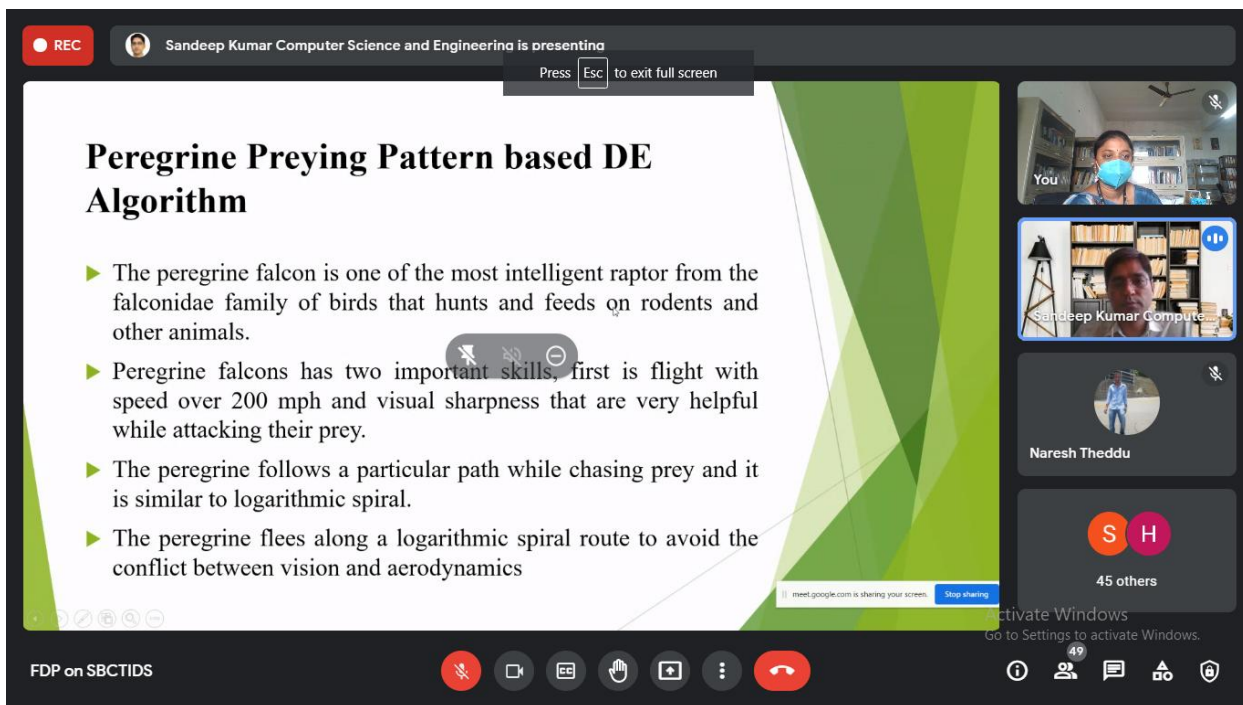


The screenshot shows a Zoom meeting interface. The main content is a slide titled "Particle Swarm Optimization" with the following bullet points:

- PSO is an optimization technique which simulates the birds flocking behavior. PSO is a dynamic population of active, interactive agents with very little in the way of inherent intelligence.
- In PSO, whole group is called *swarm* and each individual is called *particle* which represents possible candidate's solution.
- The swarm finds food for its self through social learning by observing the behavior of nearby birds who appeared to be near the food source.
- Initially each particle is initialized within the search space randomly and keeps the information about its personal best position known as *pbest*, swarm best position known as *gbest* and current velocity *V* with which it is moving, in her memory.
- Based on these three values, each particle updates its position. In this manner, whole swarm moves in better direction while following collaborative trail and error method and converges to single best known solution.

The meeting controls at the bottom show "FDP on SBCTIDS" and various icons for mute, video, chat, and call. The participant list on the right includes "You", "Sandeep Kumar Computer Science and Engineering", "sruthi mol", and "33 others".

Dr. Sandeep Kumar explaining Particle Swarm Optimization Algorithm



The screenshot shows a Zoom meeting interface. The main content is a slide titled "Peregrine Preying Pattern based DE Algorithm" with the following bullet points:

- ▶ The peregrine falcon is one of the most intelligent raptor from the falconidae family of birds that hunts and feeds on rodents and other animals.
- ▶ Peregrine falcons has two important skills, first is flight with speed over 200 mph and visual sharpness that are very helpful while attacking their prey.
- ▶ The peregrine follows a particular path while chasing prey and it is similar to logarithmic spiral.
- ▶ The peregrine flees along a logarithmic spiral route to avoid the conflict between vision and aerodynamics

The meeting controls at the bottom show "FDP on SBCTIDS" and various icons for mute, video, chat, and call. The participant list on the right includes "You", "Sandeep Kumar Computer Science and Engineering", "Naresh Theddu", and "45 others".

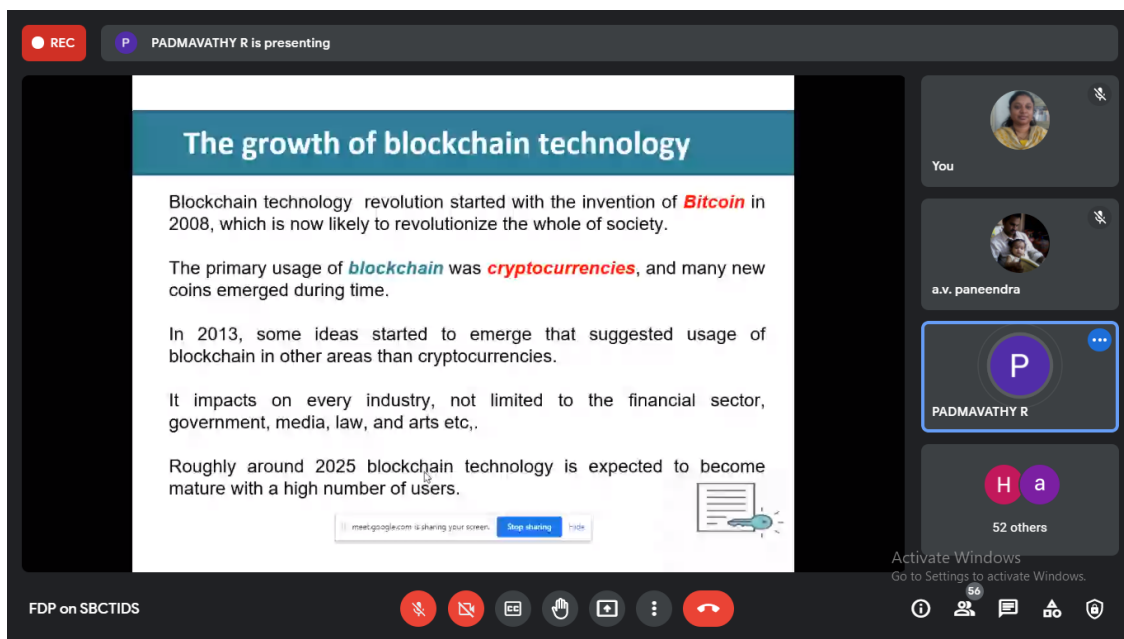
Dr. Sandeep Kumar explaining Differential Evolution Algorithm

August 26, 2021 (Day – 4, Session – 3)

The session 3 of the Day-4 was started at 2:30 PM. **Dr. R. Padmavathy**, Associate Professor, National Institute of Technology, Warangal acted as a resource person.. In this session, the resource person enlightened the participants with the concept of Block chain and its application.

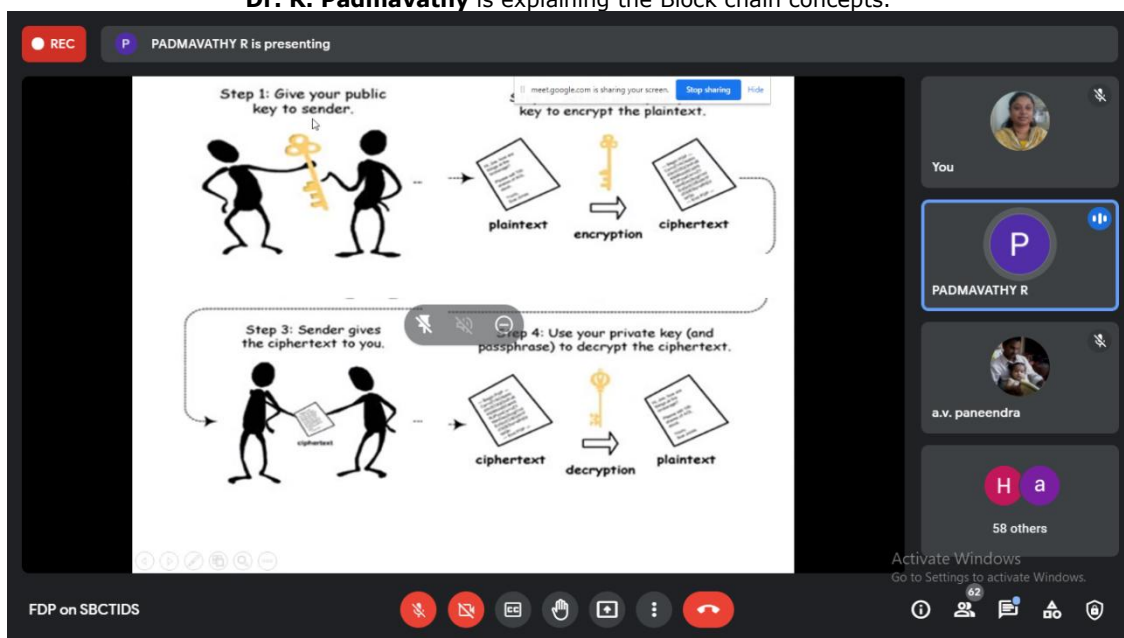
The related topics that are discussed in this session are:

- Introduction to Block Chain Technology
- Cryptographic algorithms used to create blocks
- Applications



The screenshot shows a Google Meet interface with a presentation slide. The slide title is "The growth of blockchain technology". The text on the slide reads: "Blockchain technology revolution started with the invention of **Bitcoin** in 2008, which is now likely to revolutionize the whole of society. The primary usage of **blockchain** was **cryptocurrencies**, and many new coins emerged during time. In 2013, some ideas started to emerge that suggested usage of blockchain in other areas than cryptocurrencies. It impacts on every industry, not limited to the financial sector, government, media, law, and arts etc,. Roughly around 2025 blockchain technology is expected to become mature with a high number of users." The slide also includes a "Stop sharing" button and a "hide" icon. The meeting interface shows "PADMAVATHY R is presenting" and a list of participants including "You", "a.v. paneendra", and "52 others".

Dr. R. Padmavathy is explaining the Block chain concepts.



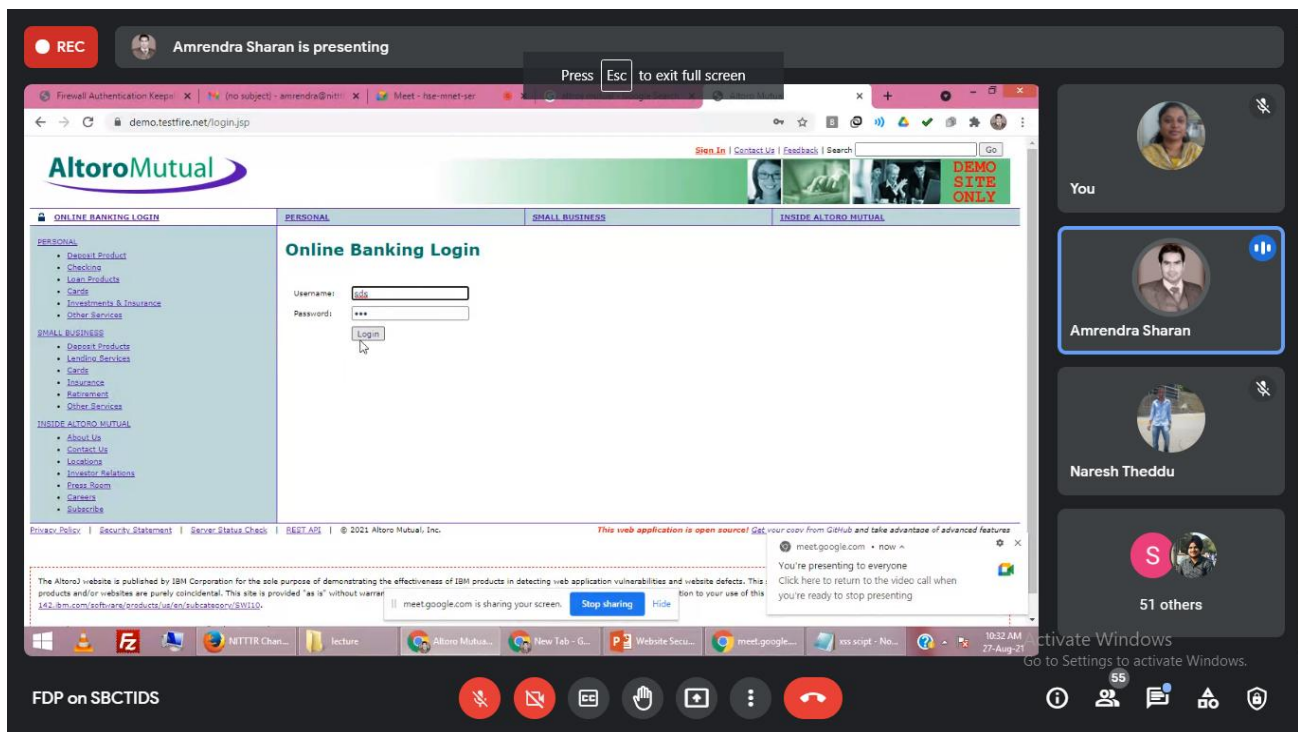
The screenshot shows a Google Meet interface with a presentation slide illustrating cryptographic concepts. The slide is divided into two parts: "Step 1: Give your public key to sender." and "Step 3: Sender gives the ciphertext to you." The first part shows a diagram where a sender gives a public key to a receiver, and then the sender uses that key to encrypt a plaintext into ciphertext. The second part shows a diagram where the sender gives ciphertext to the receiver, and the receiver uses a private key and a passphrase to decrypt the ciphertext back into plaintext. The slide also includes a "Stop sharing" button and a "hide" icon. The meeting interface shows "PADMAVATHY R is presenting" and a list of participants including "You", "a.v. paneendra", and "58 others".

Dr. R. Padmavathy is explaining Cryptographic concepts.

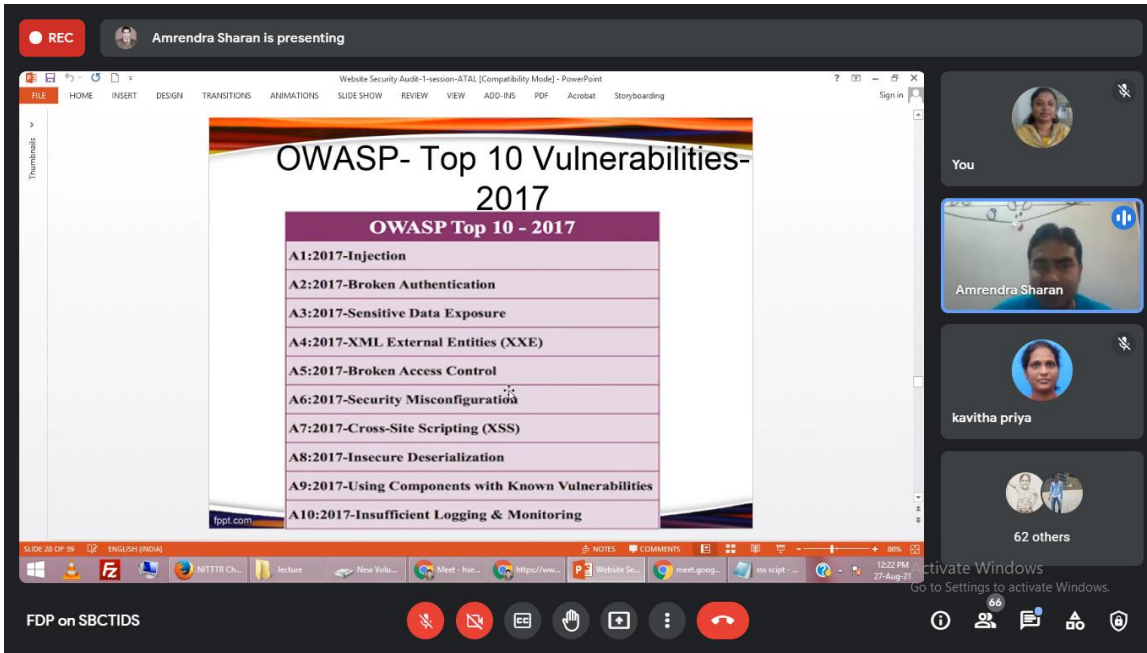
August 27, 2021 (Day – 5, Session – 1)

Mr. Amrendra Sharan, System Programmer (Group-A), Computer Science & Engineering Department, National Institute of Technical Teachers Training & Research Chandigarh, MHRD Govt. of India, NITTR Chandigarh acted as a resource person for the first two sessions of Day-5 to demonstrate hands-on High-Risk Vulnerabilities in Web Applications. The first session of Day-5 was started at 9:30 AM. In this session, **Mr. Amrendra Sharan** provided hands-on experience on the following concepts to the participants.

- Demonstration & Hands-on: High-Risk Vulnerabilities in Web Applications & OWASP Top 10 Security Risks.
- IT Security Audit, Hands-on: Vulnerabilities Assessment and Penetration Testing (VAPT) using Open Source tools



Mr. Amrendra Sharan is demonstrating the Vulnerabilities in Web Applications

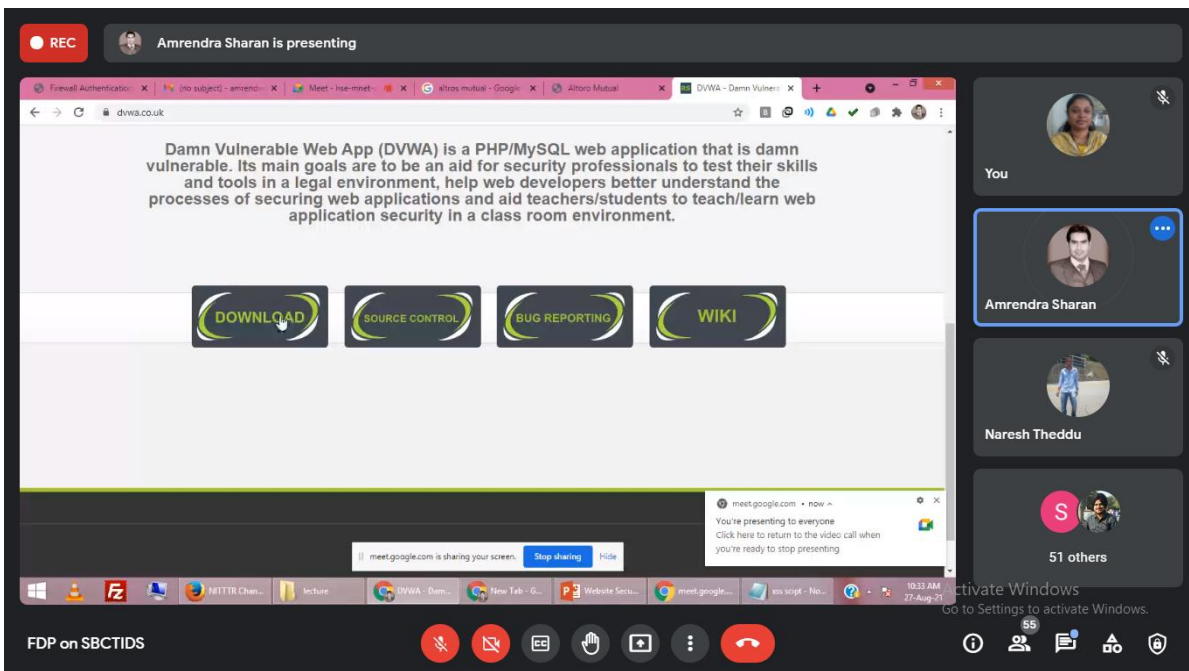


Mr. Amrendra Sharan is explaining the OWASP Top 10 Security Risks

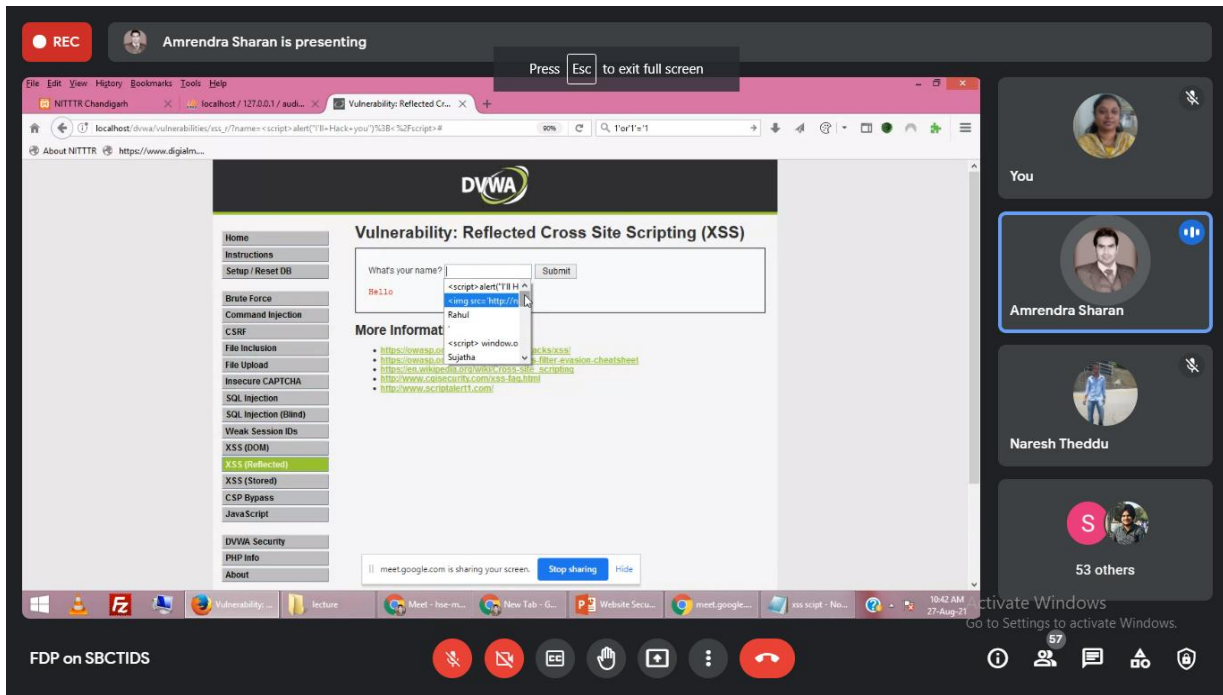
August 27, 2021 (Day – 5, Session – 2)

The second session of Day-5 was started at 11.30 AM. In this session, the participants have gained the practical knowledge on the following concepts:

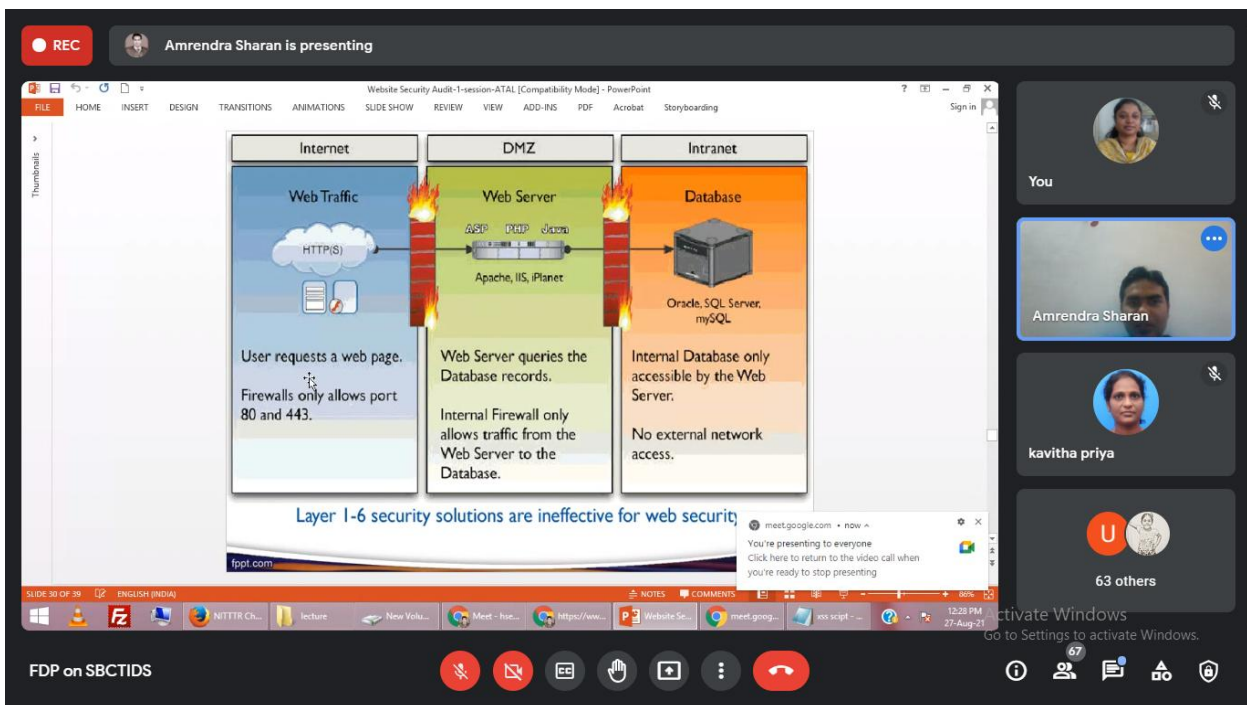
- Hands-on: Advance SQL Injection attacks, Cross-Site Scripting (XSS) attack, Phishing & CSRF Attack
- Takeover of Web server & Techniques for safeguard from website hacking



Mr. Amrendra Sharan is explaining the DVWP web application



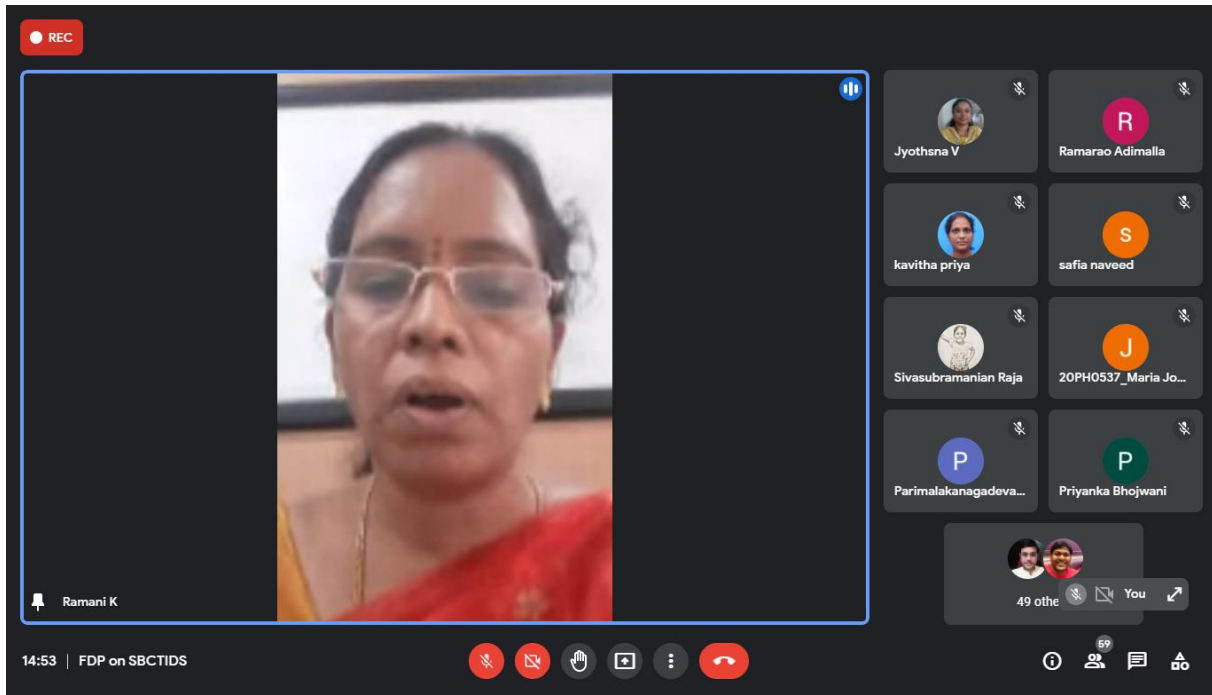
Mr. Amrendra Sharan is demonstrating Cross-Site Scripting (XSS) attack



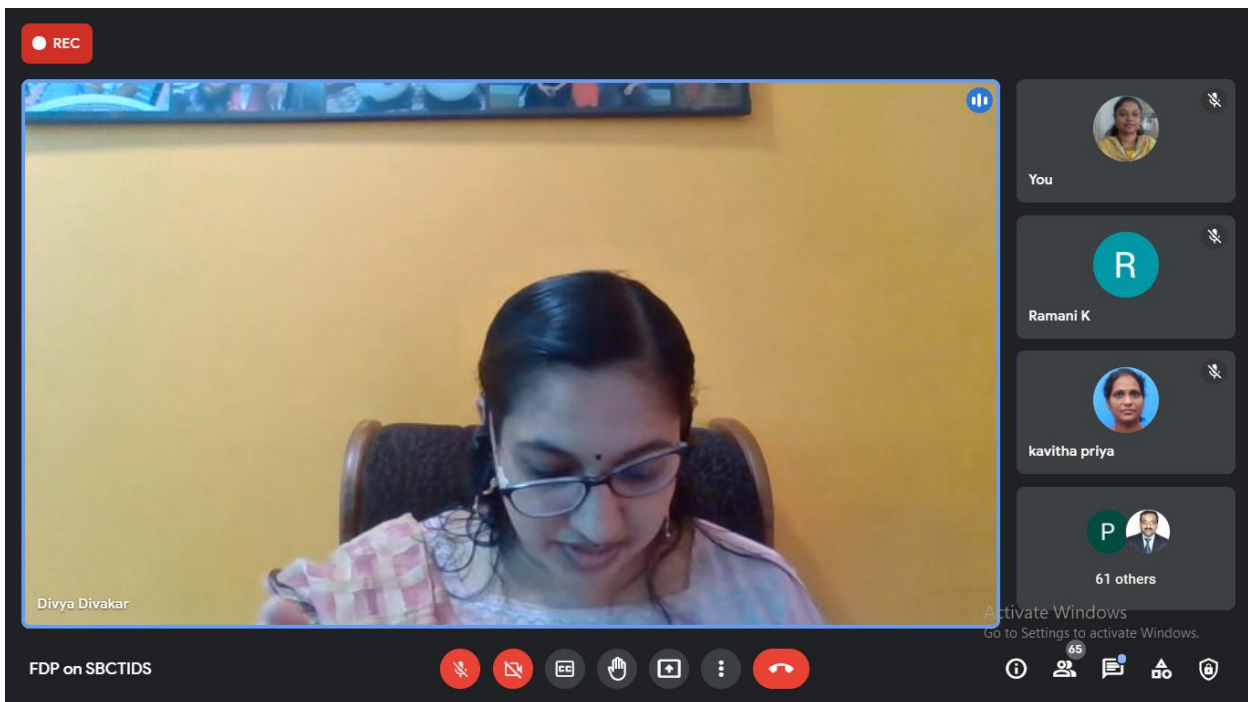
Mr. Amrendra Sharan is demonstrating Techniques for safeguard from website hacking

The valedictory function of AICTE Training and Learning (ATAL) Academy sponsored online Faculty Development Programme (FDP) on **“Social and Bio-Inspired Cyber Threat Intelligence Defense Systems”** was started at 02.30 PM on August 27, 2021. In the valedictory function, **Dr. K. Ramani**, Head and Professor, Department of Information Technology, SVEC suggested the participants to practice the concepts that are learnt in the FDP which help in improving the

personal skills as well as to train the students. Further, **Dr. V. Jyothsna**, Coordinator of ATAL FDP requested the participants to give their valuable feedback on the FDP.



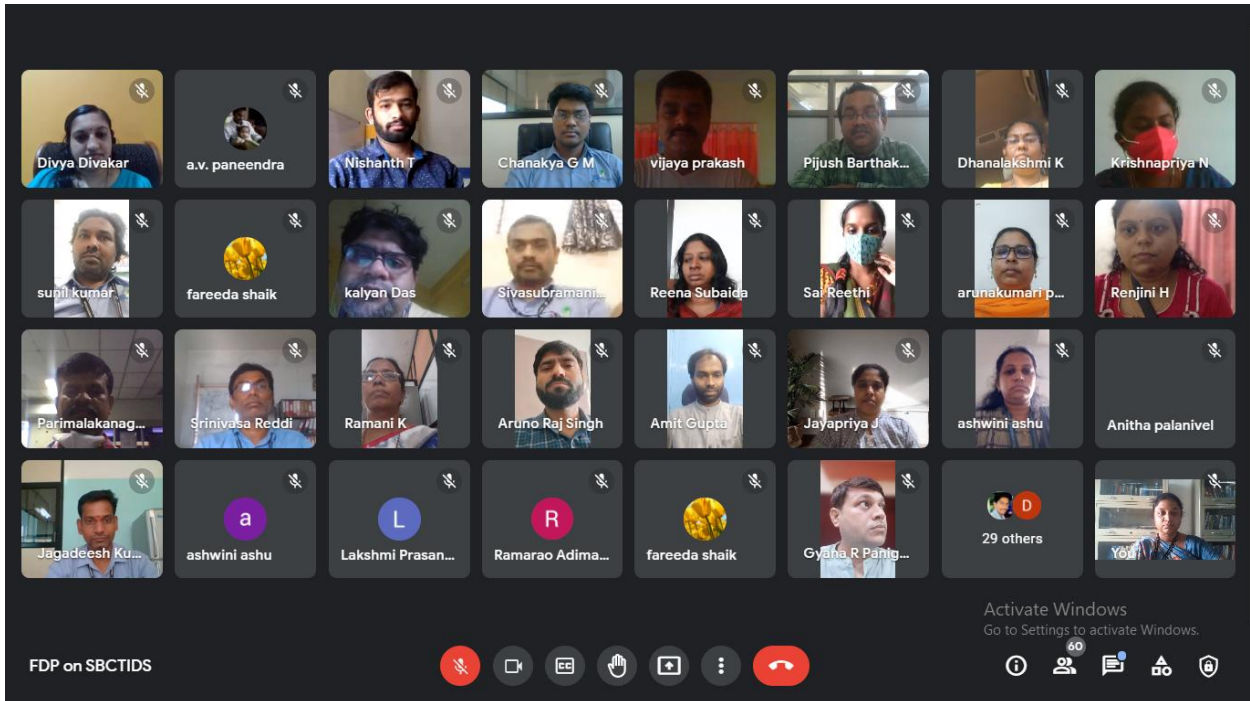
Dr. K. Ramani is sharing her views with the participants in the valedictory function.



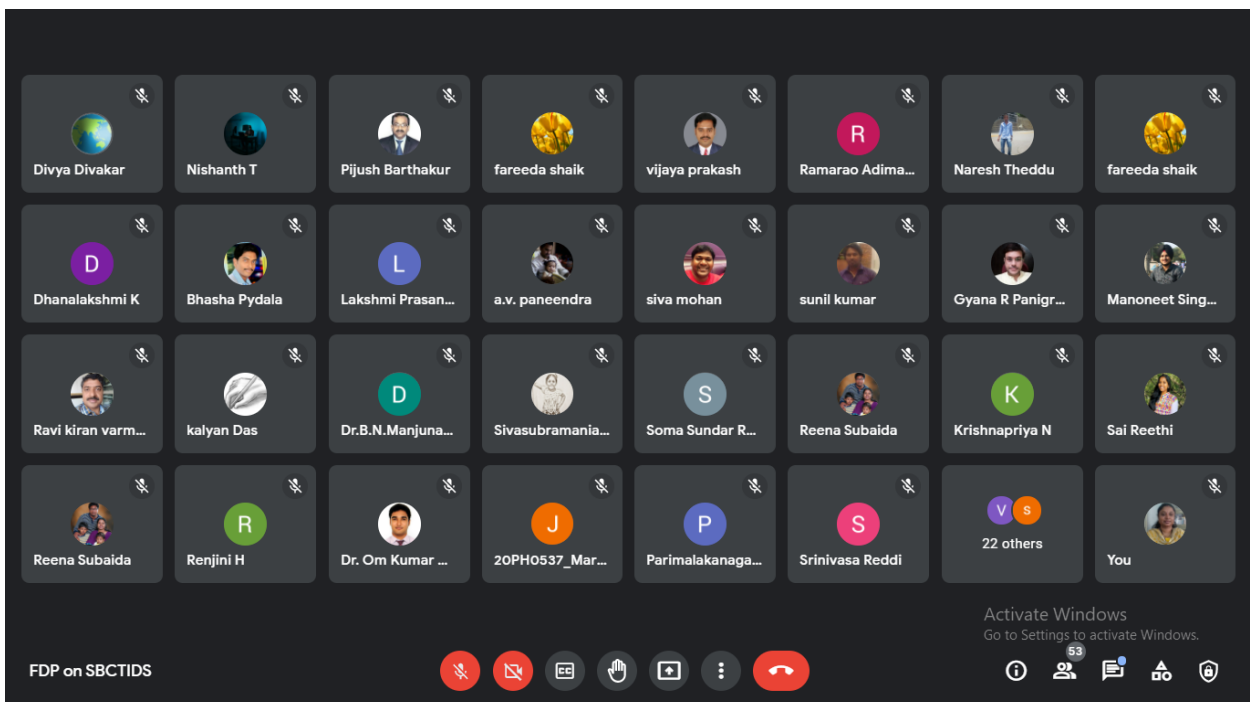
Ms. Divya Divakar is sharing a valuable feedback on the FDP

Dr. V. Jyothsna, Coordinator, ATAL FDP has proposed a Vote-of-Thanks. Initially, the coordinator thanked the Core team of ATAL for sponsoring the FDP to organize at the national level and also for their suggestions, support and guidance to conduct the FDP. Later, she thanked the

participants of various engineering colleges and government institutions across the country for their enthusiastic participation. Finally, she conveyed her heartfelt thanks to the management, Sree Vidyanikethan Engineering College (Autonomous), Tirupati, Andhra Pradesh, the Principal, Head of the Department, Information Technology for their constant support to make this event a grand success. At the end, she shared the link for the Assessment test.



Group photo - 1 of the Participants



Group photo - 2 of the Participants