All India Council for Technical Education

(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela Marg,Vasant Kunj, New Delhi-110070 Website: www.aicte-india.org

STTP- Sanction Letter

Ref. No. 34-65/220/RIFD/STTP/Policy-1/2018-19 Date_____

To

The Drawing and Disbursing Officer,
All India Council for Technical Education,
Nelson Mandela Marg,
Vasant Kunj, New Delhi – 110070

Sub: Release of grant for conduct of Short Term Training Programme (STTP) under AQIS 2018-19 during the financial year 2019-20– reg.

Sir,

This is to convey the sanction of the Council for payment of **Rs. 300000 /- (Rupees Three Lakh Only)** for conduct of Short Term Training Program as per details given below:-

1.	Name and address of the beneficiary University / Institution	VELAGAPUDI RAMAKRISHNA SIDDHARTHA ENGINEERING COLLEGE , VASANTHA NAGAR KANURU VIJAYAWADA - 7 AP, INDIA KRISHNA-520007 Andhra Pradesh
2.	Permanent ID of Institute	1-10213343
3.	Institute type	Unaided - Private
4.	Name of Coordinator	Dr. JHANSI ARETI
5.	Amount sanctioned	Rs. 300000/-
6	Amount to be released	Rs.300000/- Full & final payment
7.	Head of account	**601.15(a) Gen. Short Term Training Programme (Plan)**
8	The authorized officer in whose favour Cheque/ Demand Draft/ RTGS is to be made	REGISTRAR / DIRECTOR / PRINCIPAL
9.	Title of the programme	Trends and challenges in Design and implementation of Reconfigurable Antennas for increased spectrum access in Cognitive Radio Communication.

1. The amount of the grant shall be drawn by the Drawing and Disbursing Officer, All India Council for Technical Education on the grant-in-aid bill and shall be disbursed to and credited to the Registrar/ Director/Principal of the institute through RTGS.

2. This grant-in-aid is being released in conformity with the terms & conditions as well as norms of the scheme as already communicated, and also being communicated in this letter.

3. The Principal of the Institute and the Coordinator of the Program are requested to verify the correctness of the under-mentioned Bank Account / RTGS Details submitted by them alongwith the proposals, in which the grant is being released:-

Institute PAN No.	Bank Name	Bank Branch Name	Bank Branch Address	Account Holder Name	Account Type	Account Number	IFSC Code
AABTS1271J	SYNDICATE BANK	VRSEC KANUR U	VIJAYAWADA, ANDHRA PRADESH, PIN:520007	PRINCIPAL VR SIDDHARTHA ENGINEERING COLLEGE	Saving Account	33672200037089	SYNB0003367

Instructions/Guidelines to be followed by the University/Institution

I. Disbursement of funds to University/Institutions

a. The full amount of the grant sanctioned is being released as advance to the University/Institute.

b. The amount spent by the institute on the conduct of STTP shall be adjusted on the basis of utilization certificate and detailed expenditure statement submitted by the University/Institution on the prescribed format along with other mandatory documents viz feedback form, copy of proceedings and completion report etc.

c. The above said amount of grant shall be refunded back to AICTE if the Letter of Approval (LOA) / Extension of Approval (EOA) is not issued by AICTE to the institute for the academic year 2019-20.

II Maintenance of Accounts

a. The Institute shall strictly follow the provisions laid down in the scheme document as available on the portal.

b. Funds covered by this grant shall be kept separately and would not be mixed up with other funds so as to know the amount of interest accrued on the grant.

c. The University/College/Institute shall maintain proper accounts of the expenditure out of the grants, which shall be utilized only on approved items of expenditure.

d. The grant is intended to cover items of expenditure connected with the Short Term Training Programme such as Boarding & Lodging to the participants, TA to outstation participants, Honorarium to Course Coordinator, reading material to participants, Honorarium to resource persons, TA/DA to resource persons including two outstations resource persons & working expenses (reprographic services, postage, transport, daily wages, tea/coffee etc.

III. Conduct of test and issuance of certificate

A test shall be conducted by Program Evaluation Committee (PEC) at the end of the program and the certificates shall be issued to those participants who have attended the program and have qualified in the test.

IV. Submission of Documents by the University/Institutions to AICTE

a. The following mandatory relevant documents are required to be submitted by the University/Institution within one month of the completion of the program:-

(i) Original Statement of actual expenditure & Utilization Certificate in the prescribed proforma duly signed by the Head of the institution and countersigned by Registrar/Finance Officer/Govt. Auditor. In case of self-financing/private institutions, Statement of actual Expenditure & Utilization Certificate are required to be audited & signed and sealed by a Chartered Accountant endorsing the membership number and complete postal address. Format for the same is available on AICTE web portal.

The University/Institution is not required to submit bills/vouchers/invoices etc for the expenditure incurred out of recurring grants. However, such copies of bills/vouchers/invoices shall be digitized by respective institutions receiving grant and uploaded scanned copies of such bills/vouchers/invoices etc on the portal for availability and view at any point of time.

(ii) Feedback form in the prescribed proforma.

(iii) Copy of the proceedings and completion report.

(iv) List of candidates who have successfully completed the program on the basis of the test conducted by Program Evaluation Committee (PEC).

(v) Report submitted by Program Evaluation Committee (PEC).

b. The amount of the grant shall be adjusted on submission of utilization certificate & detailed expenditure statement by University/Institution. On receipt of these documents, the total amount of financial assistance, admissible as per the norms, shall be worked out and grant-in-aid adjusted.

V. General instructions

a. **Preferably 10% of the participants may be industry professionals deputed by industry. Further, not more than 2 participants shall be from the host institution/group of institutions.**

b. **Money to be reimbursed on the grant (for any reasons to include unspent amount, interest , penalty if imposed) shall be refunded back to AICTE in the form of Demand Draft payable to Member Secretary, AICTE, New Delhi.**

c. As AICTE needs adequate time for depositing the Demand Draft in the bank, the same be immediately dispatched to avoid any lapse of the validity period.

d. **The STTP is a residential program of a duration of six days with minimum 40 participants**. The approved STTP shall be conducted within three months from the date of release of funds.

e. **If programme is not conducted in the period of three months of the issuance of this Sanction Order, the released amount, alongwith interest accrued thereon, has to be necessarily returned back to AICTE within a month.**

f. The expenditure under the Heads **'Honorarium to Course Coordinator' and 'Honorarium to Resource Persons'** shall not exceed **1% & 20% respectively** of the total sanctioned grant for the Programme. However, overall expenditure shall not exceed the funds sanctioned for the Programme.

g. Any extra money required to complete the programme must be borne by the institute from their own resources. But the quality of the activities should not be compromised.

h. Any unavoidable circumstantial change in the program with respect to name of Project Coordinator, Venue and date for organizing STTP would mandatorily require prior approval of the Council. All such requests should be addressed to AICTE, in advance, recording the specific reasons for proposed changes, failing which the offer for the grant already issued would be treated as automatically withdrawn and the financial assistance released in favour of the beneficiary institution shall be refunded immediately to the Council. Kindly mention the File No. 34-65/220/RIFD/STTP/Policy-1/2018-19 in your future correspondence.

i. **Program Evaluation Committee (PEC)** is required to be constituted at institutional level. The constitution of the PEC shall be as under:

   (i) Principal/Director/Registrar of the institution (Chairperson).
   (ii) Coordinator of the program (Member Secretary).
   (iii) Two HoDs and one subject expert (members).

   The members of the said PEC shall not be below the rank of Associate Professor. A test shall be conducted by Program Evaluation Committee (PEC) at the end of the program and the certificates shall be issued to those participants who have attended the program and have qualified in the test. The minutes of the meetings, along with PEC report, are to be submitted to the Council at end of the program along with other mandatory documents.

j. **GoI GFR rules** (@https://doe.gov.in/order-circular/general-financial-rules2017-0) should be followed during utilization of grant.

k. This Sanction Order may be treated as Offer Letter for all purposes.

NOTE:- Any deviation from the above will invoke serious action against the Institute.

Yours sincerely,

(Dileep N Malkhede)
Advisor-I (RIFD)

12 DEC 2019

Copy forwarded for information and necessary action to: -

1. **Name and Address of the Coordinator**
   Dr. JHANSI ARETI
   VELAGAPUDI RAMAKRISHNA SIDDHARTHA ENGINEERING COLLEGE
   VASANTHA NAGAR KANURU VIJAYAWADA - 7 AP, INDIA
   VIJAYAWADA 520007 Andhra Pradesh
2. **The Registrar / Director / Principal**
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   VIJAYAWADA 520007 Andhra Pradesh

REGISTRATION FORM

One Week National Level Online Short Term Training Program (STTP)

on

"Trends and Challenges in Design and Implementation of Reconfigurable Antennas for Increased Spectrum Access in Cognitive Radio Communication"

STTP-II 24th -29th August 2020

Name:_____

Designation:_____

Institution/Organization:_____

Address:

Contact Number:_____

Email:_____

Qualifications:_____

Experience in years:

Teaching: Research: Industry:

Signature of the Participant

Last date for Registration: 19th August 2020

Address for Communication:
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Professor, ECE Dept.
V.R. Siddhartha Engg. College
Kanuru, Vijayawada-520007, AP
Mail id: aictesttp2020.ece@gmail.com
Mobile. No: 9949894526 & 9494049281

Chief Patrons

Sri N. Venkateswarlu, President, Siddhartha Academy of General& Technical Education (SAGTE), Vijayawada

Patrons

Sri P. Lakshmana Rao, Secretary, SAGTE
Sri S. Venkateshwara Rao, Treasurer**,** SAGTE
Sri M. Rajayya, Vice-President, SAGTE & Convener, VRSEC

College Advisory Committee

Dr. A. V. Ratna Prasad, Principal
Dr. N. N. Sastry, Prof. of ECE & Dean R &D
Dr. B. Panduranga Rao, Prof.of CE & Dean SA

Convener

Dr .P .V. Subbaiah
Professor & Head of ECE

Organizing Advisory Committee

Faculty members of ECE Department

Registration link:

http://tiny.cc/VRSEC-ECE-STTP2-CRC

Eligibility

The STTP is open to faculty members of AICTE approved Institutions, Research scholars and persons from industry and R&D organizations from all over country.

Registration Fee: ***NIL***

Online meeting link will be provided through **whatsapp.**

The number of Participants will be limited to 150

***Note:**E- Certificates will be provided to those participants who attend all the sessions of the program and also appear for the online test as per the norms of AICTE.

AICTE Sponsored

ONE WEEK NATIONALLEVELONLINE SHORT TERM TRAINING PROGRAM

on

"Trends and Challenges in Design and Implementation of Reconfigurable Antennas for Increased Spectrum Access in Cognitive Radio Communication"

STTP-II 24th -29th August 2020

Coordinators

Dr. A. Jhansi Rani, Prof. of ECE

Co Coordinators

Dr. M. Padmaja, Prof. of ECE
Mr.A.Raviraja Asst. Prof. of ECE

Organized by

Department of Electronics & Communication Engineering
Velagapudi Ramakrishna
Siddhartha Engineering College
(Autonomous)
(Sponsored by Siddhartha Academy of General& Technical Education)
Kanuru, Vijayawada-520007
Andhra Pradesh
www.vrsiddhartha.ac.in
☎: **0866-2582333, 2584930**

About the College:

Velagapudi Ramakrishna Siddhartha Engineering College (VRSEC) was established in the year 1977 as the first Self-financing Engineering College in the state of A.P. It is located in a vast expanse of 24.05 acres ofland on the outskirts of Vijayawada city at a distance of about 6Kms from the city centre. The college is offering 7 UG (B.Tech) Courses with intake of 1140, 9 PG- M.Tech with 180, MBA with 60 and MCA with 60. The college has been accredited four times by National Board of Accreditation (NBA) of All India Council for Technical Education (AICTE), New Delhi in respect of all Engineering disciplines and also certified for ISO 9001:2008. It is affiliated to Jawaharlal Nehru Technological University, Kakinada, AP. Autonomous status was conferred by UGC in the year 2006 and extended for 10 years upto 2027-28 without visit to the college, first in AP. It is one among the top 16 Engineering Colleges selected with Rs 6 crores funding under World Bank aid for R&D and PG enhancement programme called TEQIP –II (S.C.1.2) by MHRD, Govt. of India. The institute secured AAA ranking and all India 7thposition for the participation by students and faculty in NPTEL/SWAYM. The College received Platinum Award in years 2017, 2018 & 2019 as a Best Industry Linked Technical Institute by AICTE-CII Survey. It is also recognized as “Scientific & Industrial Research Organization (SIRO)” by DSIR. MST, Govt. of India since August 2017.

About ECE Department:

Established in the year 1977, the department of ECE offers B.Tech Programme in Electronics & Communication Engineering with an intake of 240 and two M.Tech Programmes in Communication Engineering & Signal Processing and VLSI Design & Embedded Systems with an intake of 18 each. The department has been accredited by NBA of AICTE four times. More than 40% faculties are with Ph.D. qualification. Led by a team of highly qualified experienced faculty with specializations such as RF &Microwave, Antennae, Digital Signal Processing, Wireless Communications, Digital Image Processing, VLSI and Embedded systems etc, the department provides excellent academic and research environment to the UG, PG and research students. A centre of Excellence (TIFAC CORE- DST) in Telematics was established in the year 2009 with the state of the art facilities. Having successfully completed many research projects funded by UGC, AICTE, NRSC-ISRO DLRL & ANURAG-DRDO etc., it is also recognized by JNTUK as "**Research Center.**" Faculty members extend guidance to research scholars, produce Ph.D.’s and publish their findings in peer reviewed national and international journals and conferences.

About STTP:

Cognitive radio (CR)is a cutting edge technology for wireless communications that requires the design of novel spectrum sensing schemes with high degree of reliability. These networks can dynamically allocate spectrum to multiple users, thereby easing network congestion. Reconfigurable antennas play important roles in smart and adaptive systems which offer several advantages such as multifunctional capabilities, low front-end processing efforts with no need for a filtering element, good isolation, and sufficient out-of-band rejection. These make them well suited for use in wireless applications such as 4G and 5G mobile terminals.

Note: The STTP is planned in three phases. The basic concepts and fundamentals in the first STTP, current technologies and applications in the second STTP and futuristic trends and challenges in the third STTP . However they are independent. The dates for the other two STTPs will be informed later.

Objectives of STTPs:

The program focuses on Antenna design aspects and simulation for cognitive radio Communication with a synthesis approach and progressively builds up the background through an illustrative design and characterization set of learning activities of some of the basic concepts of spectrum access techniques

Course Contents:

- Role of AI in 5G – Opportunities and Challenges
- Increased Spectrum Access for wireless communication
- Reconfigurable Antennas: Spectrum Sensing
- Time Optimal Spectrum Sensing
- Design of Microstrip Patch Antenna using Probe feed using HFSS
- Aspects of RF IC design
- SDR – Fundamentals, Hardware Configuration
- GNU Radio
- Cellular networks operation on the unlicensed spectrum
- Challenges in Reconfigurable antenna design
- Application of Reconfigurable antenna in CRC .
- Optimization Techniques

Resource Persons:

Dr. Samar Shailendra
Scientist at TCS Research & Innovation &
Visiting faculty at IIIT Bangalore
Dr. G. Rama Murthy, Prof. of CSE
Mahindra University, Hyderabad

Dr. Abhinav Kumar, Associate Professor,
Dept. of Electrical Engineering, IIT Hyderabad

Dr. P. Sreehari Rao , Associate Professor of ECE, NITW, Warangal
Dr. A. Prakasa Rao, Associate Professor of ECE, NITW, Warangal
Mr Hemant Katakkar, Director. Technical, Akademika
Ms Kalyani , Application Engineer**,** Akademika
Mr Shankar Nair, Director, Sales & Marketing Akademika
Er. M.Vinoth Manoharan , Co-Founder & CTO
Wilma Comm unications Groups (Asia | US | Europe)
Er. shashikumar R Application Engineer
Entuple technologies, Bangalore

AICTE Sponsored
ONE WEEK NATIONAL LEVEL ONLINE SHORT TERM TRAINING PROGRAM
on
Trends and challenges in Design and Implementation of Reconfigurable Antennas for Increased Spectrum Access in Cognitive Radio Communication Dt: 24th -29thAugust 2020
STTP-II
Online Platform : ZOOM

Date	Expert Details	Timings	Module Content
Day- 1 Monday 24.08.2020	**Er. Samar Shailendra** Scientist at TCS Research & Innovation & Visiting faculty at IIIT Bangalore	10 AM to 11.30AM	Role of AI in 5G – Opportunities and Challenges
	Dr. A Prakasa Rao, Assoc. Prof., NITW, Warangal	2.30PM to4.00PM	Optimization Techniques in Beamforming
Day-2 Tuesday 25.08.2020	**Dr. G. Rama Murthy,** Professor Dept. of CSE, Mahindra University, Hyderabad	10AM to 11.30AM	Cognitive Radio: Reconfigurable Antennas: Spectrum Sensing
		2.30PM to 4.00PM	Reconfigurable Antennas : Time Optimal Spectrum Sensing
Day-3 Wednesday 26.08.2020	**Er. Shashikumar R** Application Engineer EntupleTechnologies, Bangalore	10.AM to 11.30AM	Design of Microstrip Patch Antenna using Probe feed using HFSS
	Dr. G. Rama Murthy, Professor Dept. of CSE, Mahindra University, Hyderabad	2.30PM to 4.00PM	Increased Spectrum Access for wireless communication
Day-4 Thursday 27.08.2020	**Mr Hemant Katakkar,** Director. Technical, Akademika **Ms Kalyani** , Application Engineer**,** Akademika **Mr Shankar Nair**, Director, Sales & Marketing Akademika	10AM to 11.30AM	SDR – Fundamentals, Hardware Configuration
		2.30PM to 4.00PM	GNU Radio
Day-5 Friday 28.08.2020	**Dr.P. Sreehari Rao ,** Assoc. Prof, NITW, Waranga	10AM to11.30AM	Aspects of RF IC design
	Er. M.Vinoth Manoharan , Co-Founder & CTO Wilma Comm unications Groups (Asia | US | Europe)	2.30PM to 4.00PM	Challenges in Reconfigurable antenna design
Day-6 Saturday 29.08.2020	**Dr. Abhinav Kumar,** Associate Professor, Department of Electrical Engg., IIT Hyderabad,	10AM to11.30AM	Cellular networks operation on the unlicensed spectrum
	Er. M.Vinoth Manoharan , Co-Founder & CTO Wilma Comm unications Groups (Asia | US | Europe)	2.30PM to 4.00PM	Application about Reconfigurable antenna in Cognitive radio Communication

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STTP II- REPORT ON TRENDS AND CHALLENGES IN DESIGN AND IMPLEMENTATION OF RECONFIGURABLE ANTENNAS FOR INCREASED SPECTRUM ACCESS IN COGNITIVE RADIO COMMUNICATION

This is six day STTP programme organized by ECE department, VRSEC during **24th - 29thAugust 2020.**

Cognitive radio (CR) is a cutting edge technology for wireless communications that requires the design of novel spectrum sensing schemes with high degree of reliability. These networks can dynamically allocate spectrum to multiple users, thereby easing network congestion.

Reconfigurable antennas play important roles in smart and adaptive systems which offer several advantages such as multifunctional capabilities, low front-end processing efforts. These make them well suited for use in wireless applications such as 4G and 5G mobile terminals.

Er. Samar Shailendra, Scientist at TCS Research & Innovation Visiting faculty at IIIT Bangalore is keynote speaker

The resource persons are:

Academicians

1. **Er. Samar Shailendra,** Scientist at TCS Research & Innovation Visiting faculty at IIIT Bangalore
2. **Dr. G. Rama Murthy,** Prof. of CSE, Mahindra University, Hyderabad
3. **Dr. A. Prakasa Rao**, Associate Professor, NITW, Warangal
4. **Dr. P. Sreehari Rao,** Associate. Professor, NITW, Warangal
5. **Dr. Abhinav Kumar,** Associate Professor, Department of Electrical Engineering., IIT Hyderabad,

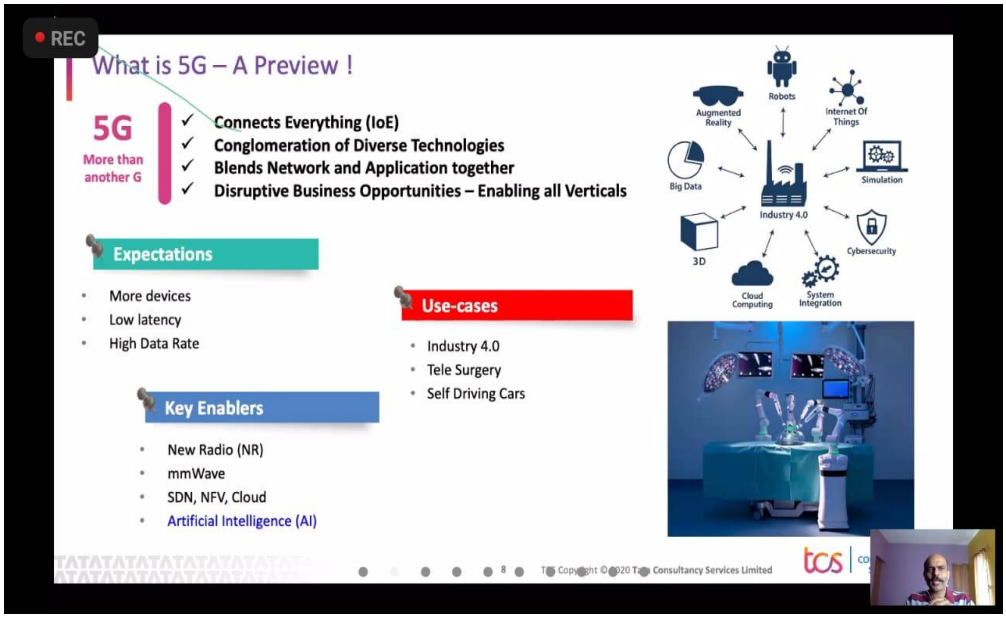
Industry experts

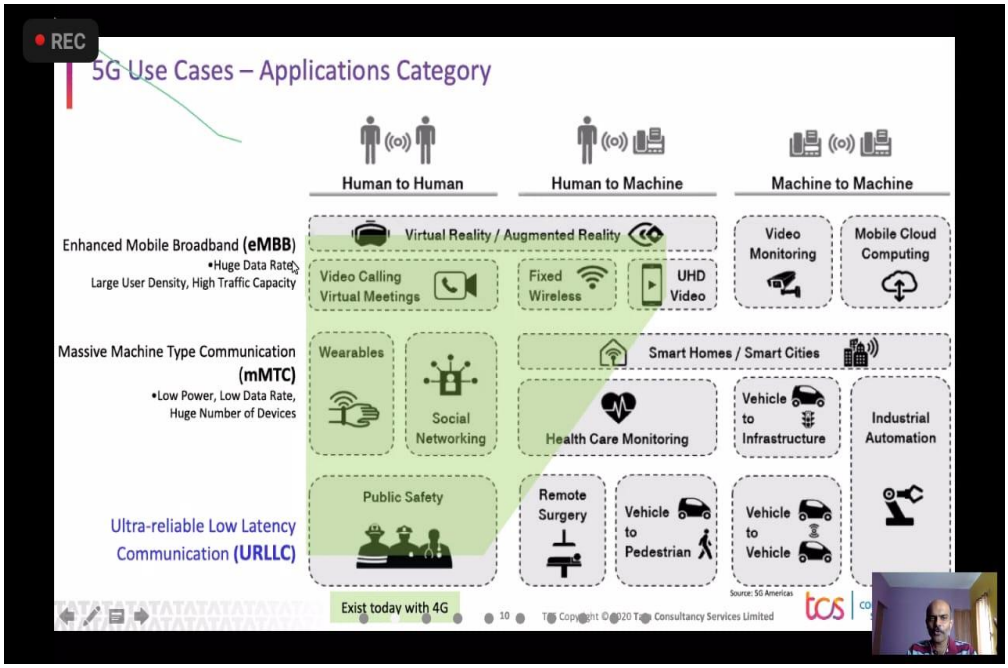
1. **Er. M.Vinoth**, Co-Founder & Head. Wilma Communications Groups (Asia | US | Europe)
2. **Er. R. Shashikumar (**Application Engineer) Entuple technologies, Bangalore
3. **Mr. Hemant Katakkar** (Application Engineer) Director. Technical, Akademika
4. **Ms Kalyani** , Application Engineer, Akademika
5. **Mr Shankar Nair**, Director, Sales & Marketing Akademika

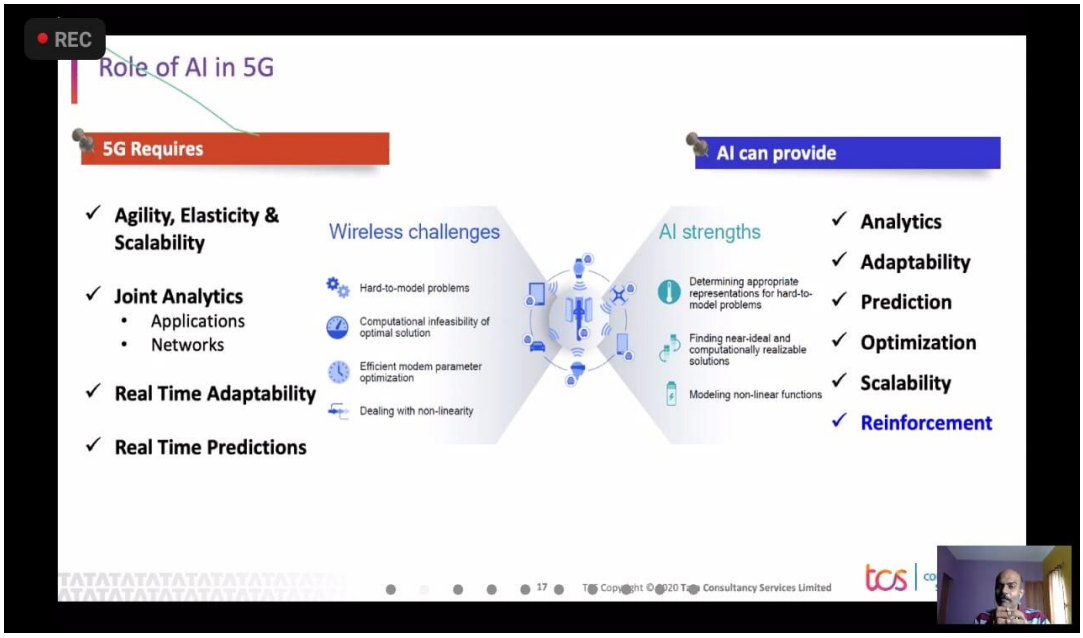
Day 1: Session 1

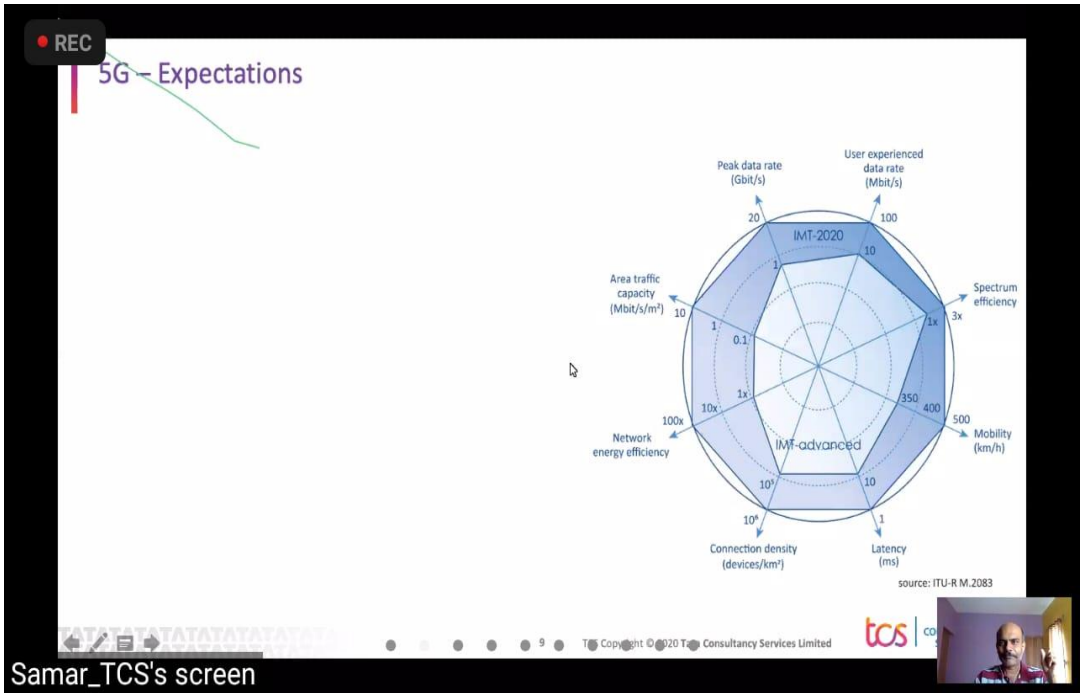
Er. Samar Shailendra, Scientist at TCS Research & Innovation Visiting faculty at IIIT Bangalore. He delivered expert lecture on "**Role of AI in 5G – Opportunities and Challenges".**

- Evolution Of Networks.
- What Is 5G- A Preview!
- 5G Expectations.
- 5G Use Cases Applications Category.
- 5G Service Based Architecture.





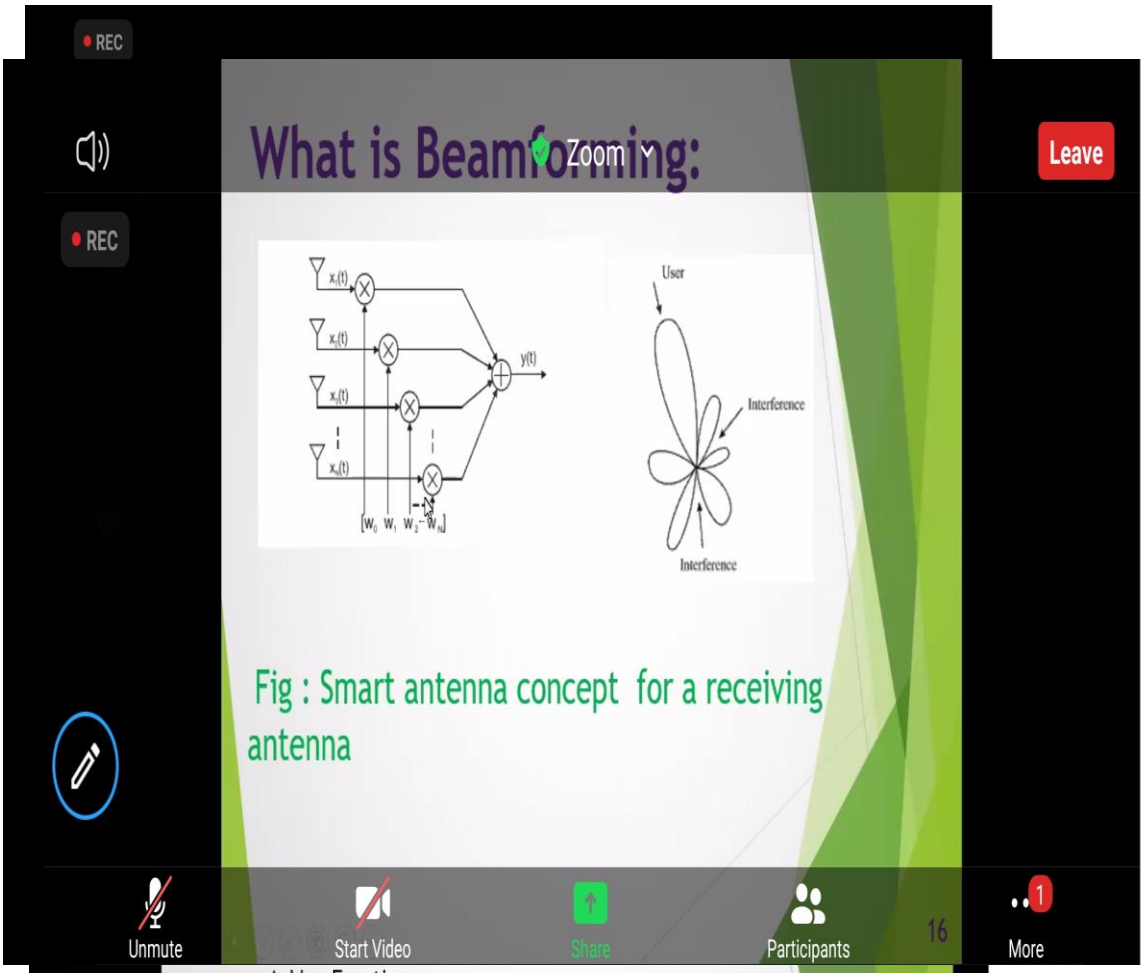




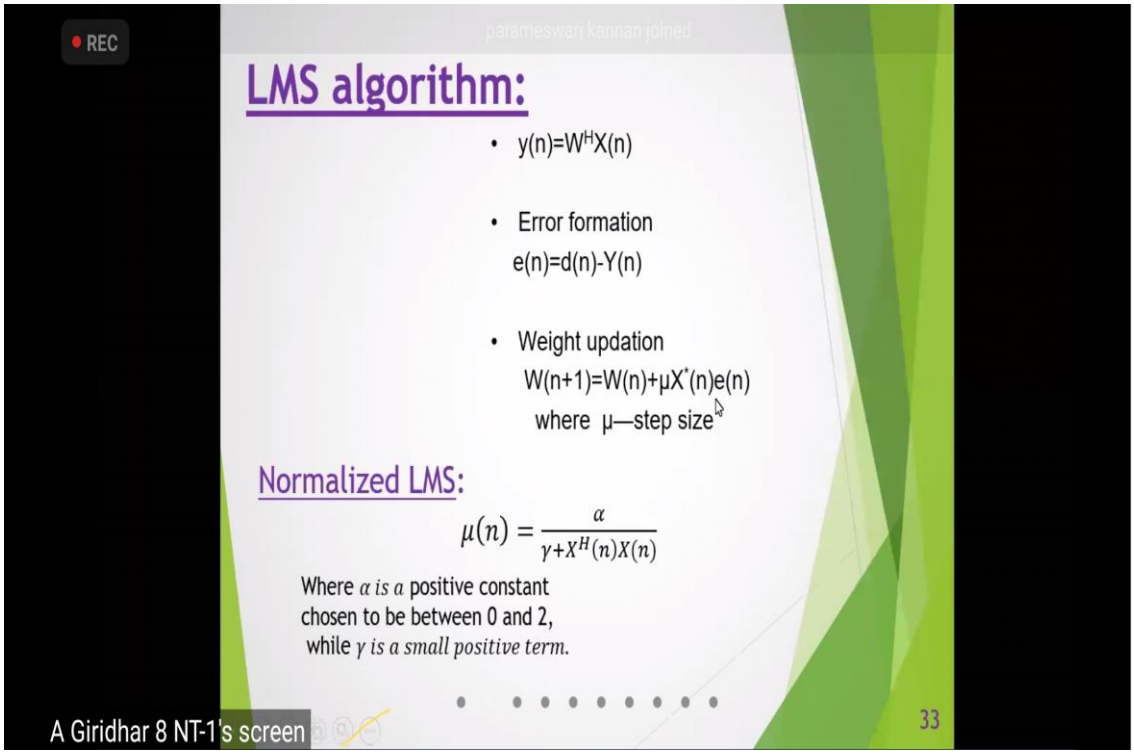
Day 1: Session 2

This session was presented by **Dr. A Prakasa Rao**, Associate. Professor, NITW, Warangal his talk on "**Optimization Techniques in Beamforming-I".**

- Motivation and problem statement.
- Introduction
- Organization of topics
- Algorithm 1-LMS
- Algorithm 2-Taguchi Method


REC
Zoom
Leave
What is Beamforming:
User
Interference
Interference
Fig : Smart antenna concept for a receiving antenna
Unmute
Start Video
Share
Participants
16
More

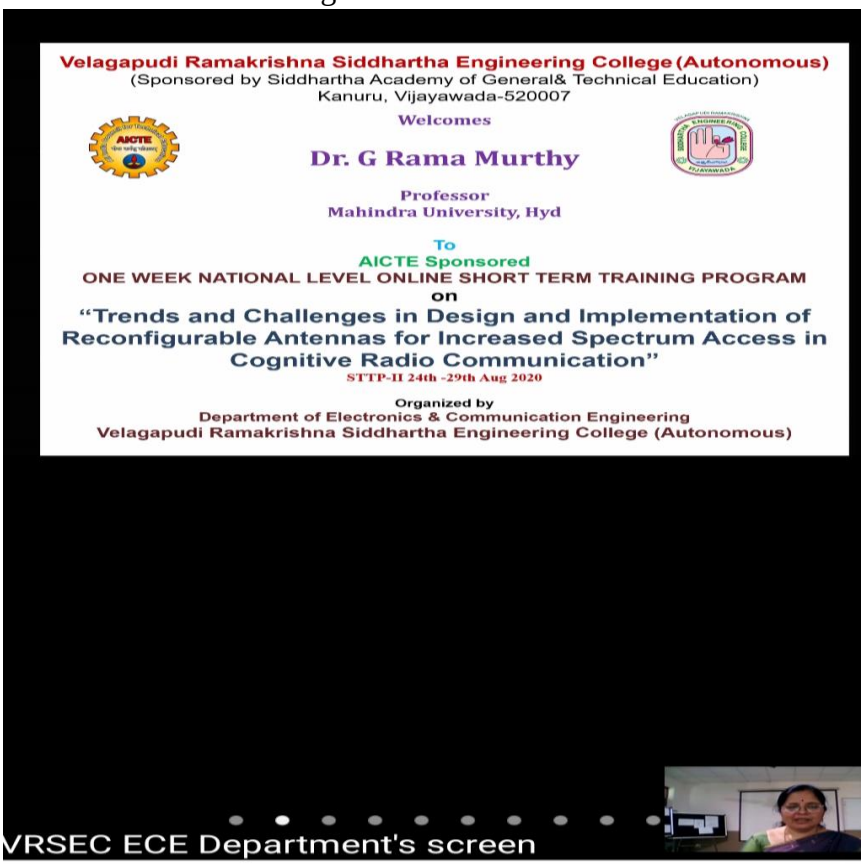

Ackley Function
Drop-Wave Function
Eggholder Function
Griewank Function
Holder Table Function
Valley-Shaped
Three-Hump Camel Function
Six-Hump Camel Function
Rosenbrock Function
Bowl-Shaped
Sphere Function
Sum of Different Powers Function
Sum Squares Function
Plate-Shaped
Booth Function
A Giridhar 8 NT-1's screen

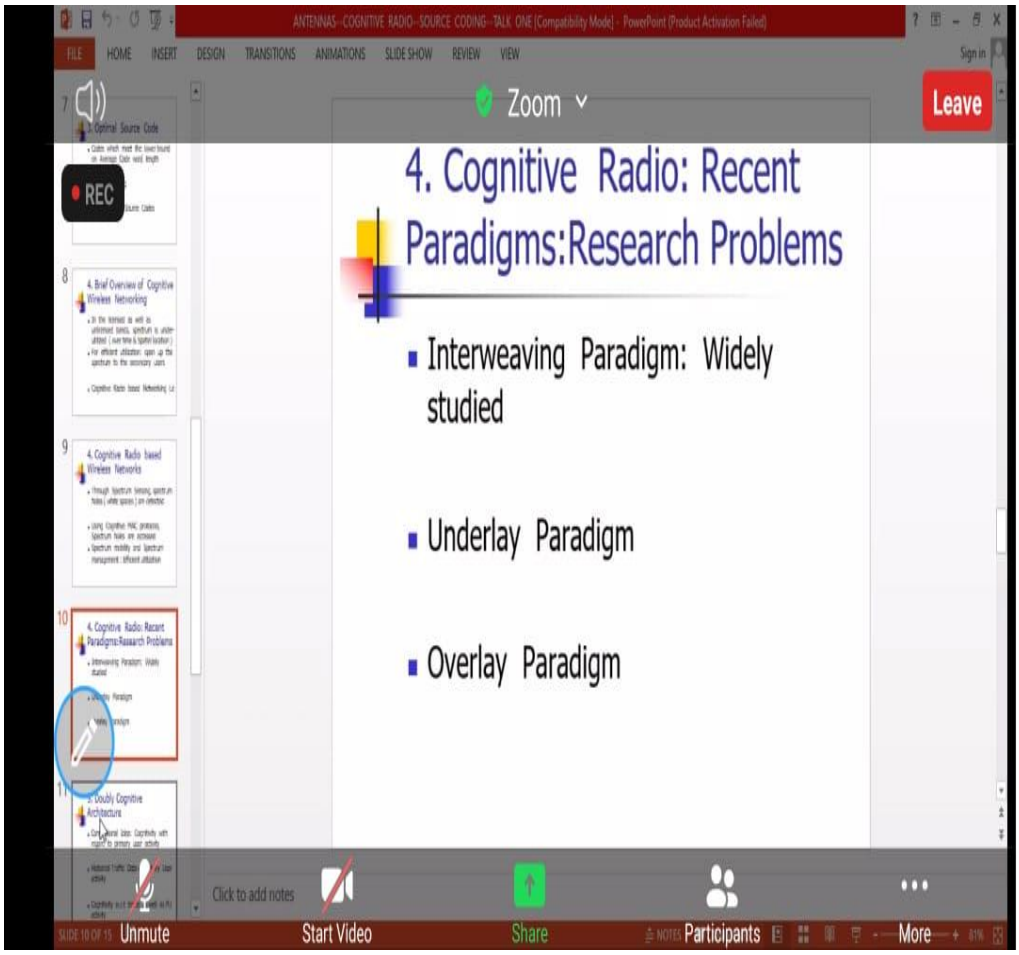


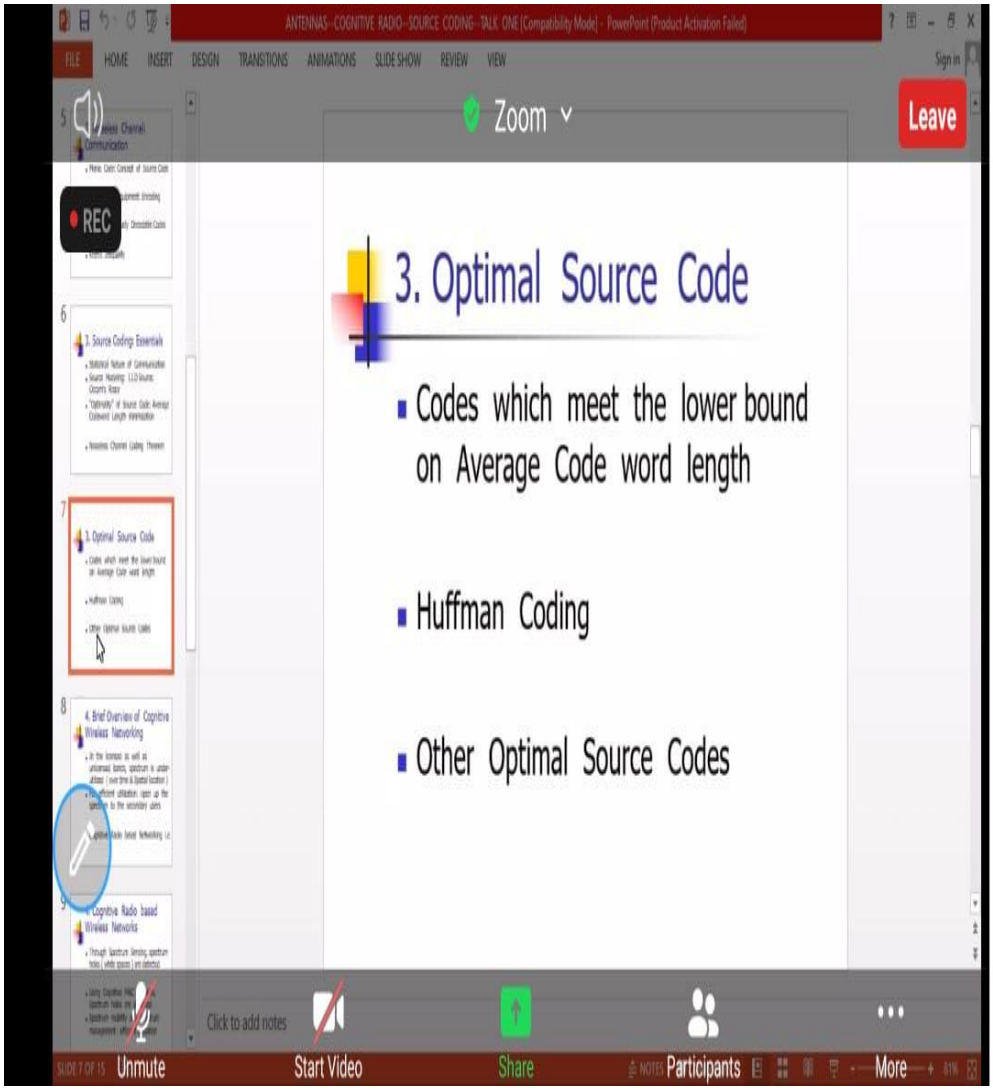
Day 2 Session 3

Dr. G. Rama Murthy, Professor Dept. of CSE, Mahindra University, Hyderabad his talk on "**Cognitive Radio: Reconfigurable Antennas: Spectrum Sensing".**

- Overview of digital communication.
- Noiseless channel: Communication.
- Source coding: Essentials.
- Cognitive radio: Recent Paradigms.




ANTENNAS- COGNITIVE RADIO- SOURCE CODING- TALK ONE [Compatibility Mode] - PowerPoint (Product Activation Failed)
FILE HOME INSERT DESIGN TRANSITIONS ANIMATIONS SLIDE SHOW REVIEW VIEW
Sign in
Zoom
Leave
REC
4. Cognitive Radio: Recent Paradigms:Research Problems
Interweaving Paradigm: Widely studied
Underlay Paradigm
Overlay Paradigm
Click to add notes
SLIDE 10 OF 15
Unmute
Start Video
Share
NOTES
Participants
More


ANTENNAS- COGNITIVE RADIO- SOURCE CODING- TALK ONE [Compatibility Mode] - PowerPoint (Product Activation Failed)
FILE HOME INSERT DESIGN TRANSITIONS ANIMATIONS SLIDE SHOW REVIEW VIEW
Sign in
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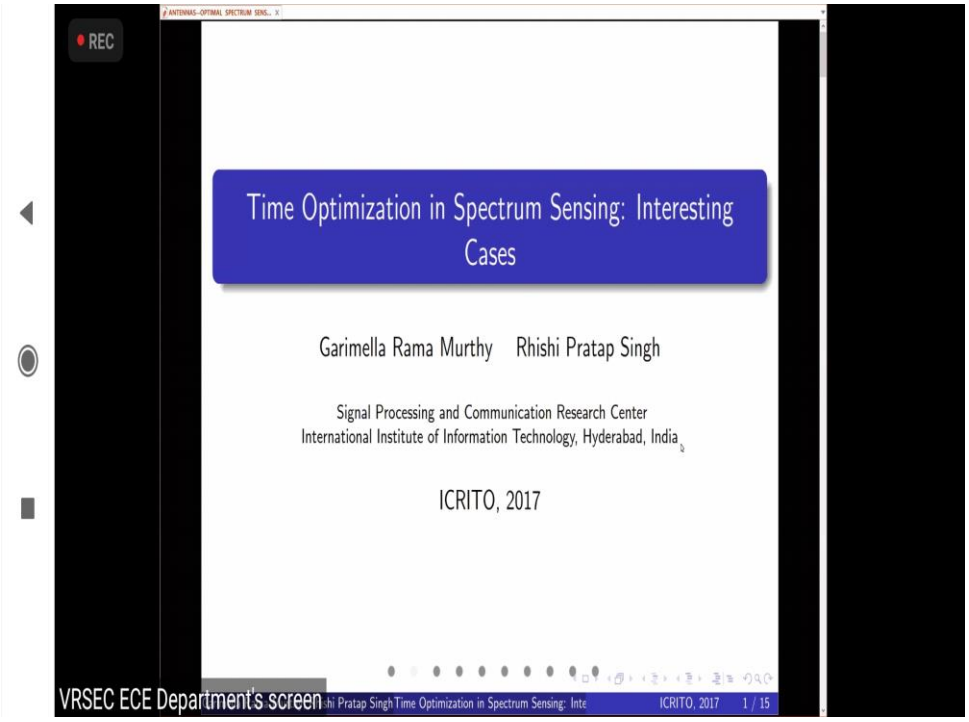
3. Optimal Source Code
Codes which meet the lower bound on Average Code word length
Huffman Coding
Other Optimal Source Codes
Click to add notes
SLIDE 7 OF 15
Unmute
Start Video
Share
NOTES
Participants
More

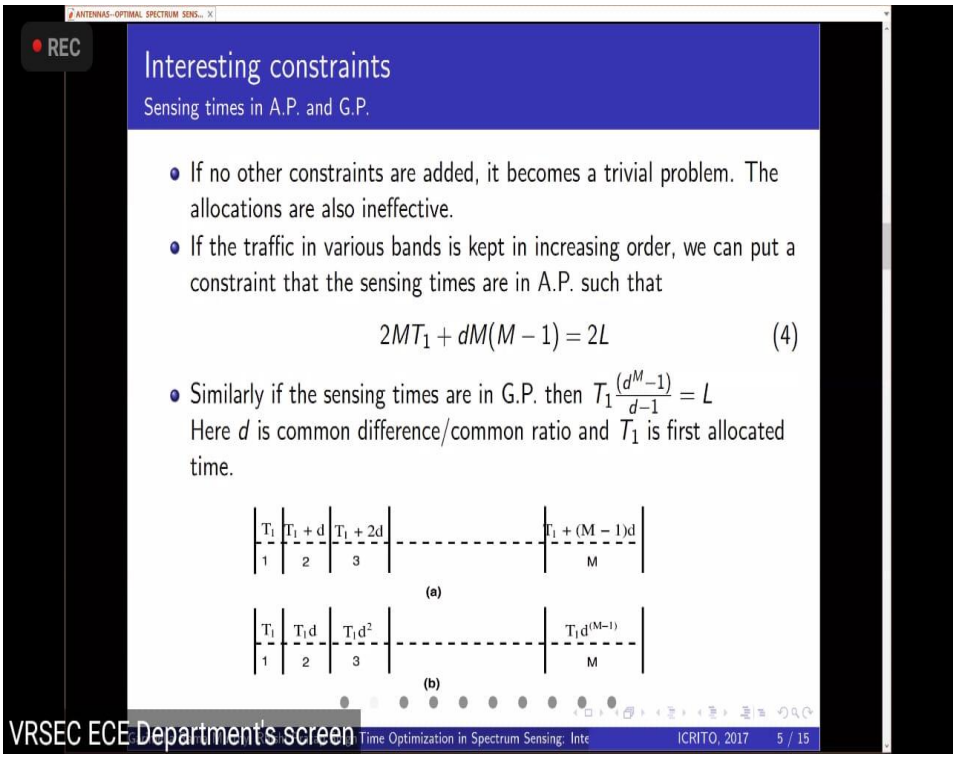
Day 2 Session 4

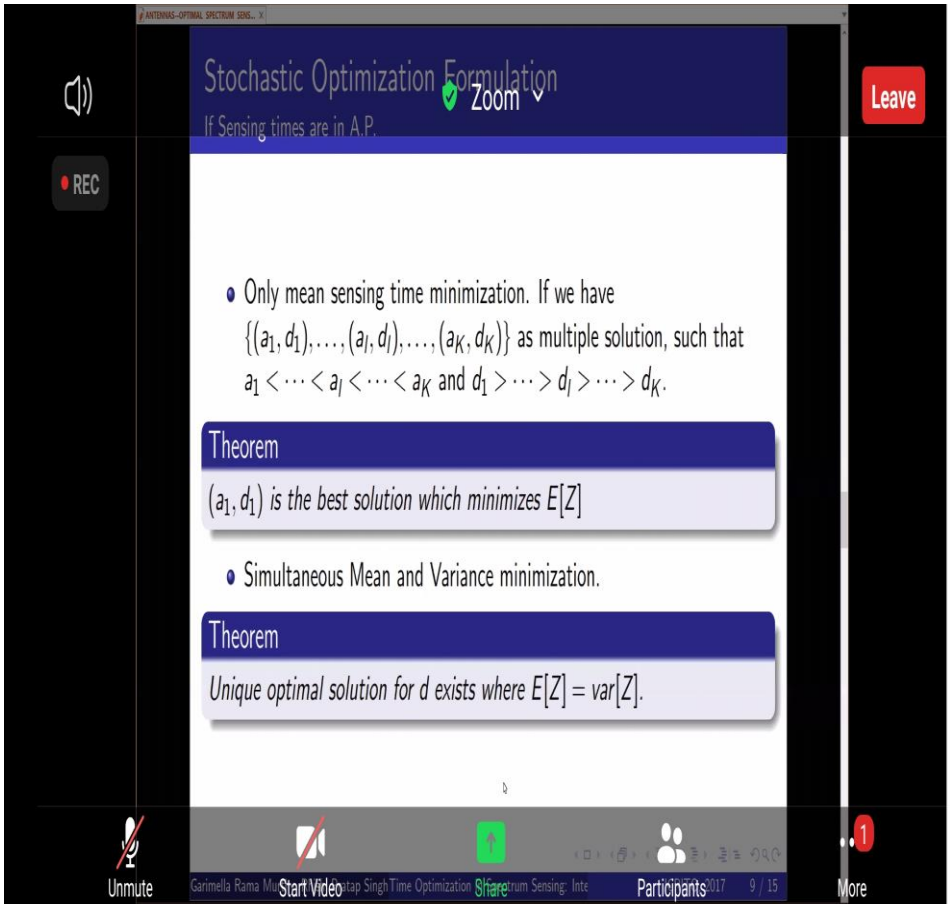
Dr . G. Rama Murthy, Professor Dept. of CSE, Mahindra University, Hyderabad delivered lecture on **"Reconfigurable Antennas : Time Optimal Spectrum Sensing".**

HE clearly discussed on

- Introduction
- Problem statement
- Stochastic formulation
- Most general solution



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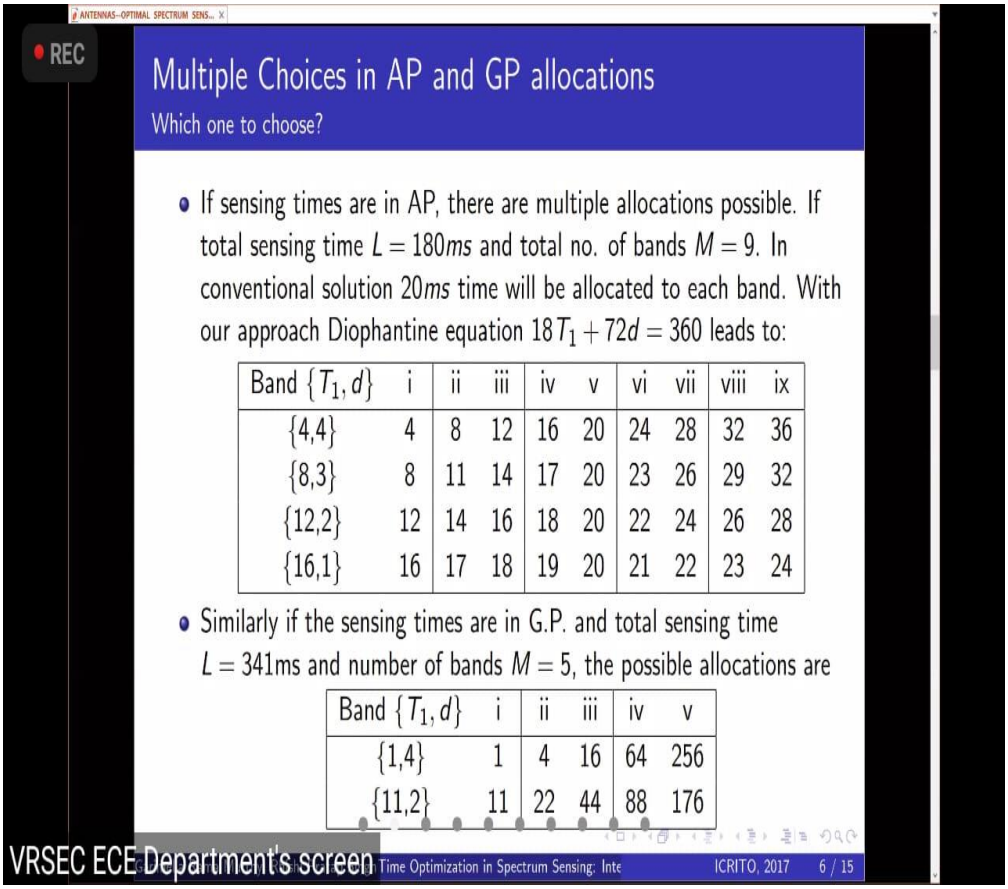
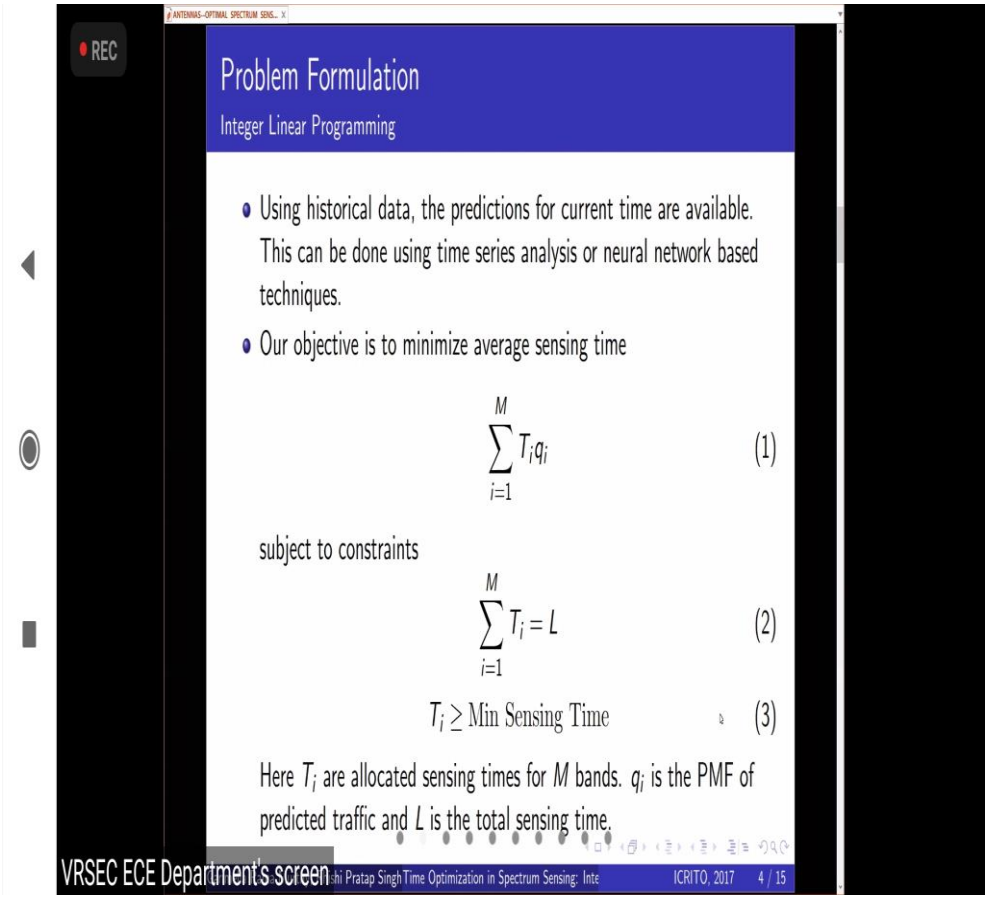
REC
Stochastic Optimization Formulation
If Sensing times are in A.P.
Only mean sensing time minimization. If we have $\{(a_1, d_1), \ldots, (a_l, d_l), \ldots, (a_K, d_K)\}$ as multiple solution, such that $a_1 < \cdots < a_l < \cdots < a_K$ and $d_1 > \cdots > d_l > \cdots > d_K$.
Theorem
(a_1, d_1) is the best solution which minimizes $E[Z]$
Simultaneous Mean and Variance minimization.
Theorem
Unique optimal solution for d exists where $E[Z] = var[Z]$.
Unmute
Start Video
Share
Participants
More


REC
Multiple Choices in AP and GP allocations
Which one to choose?
If sensing times are in AP, there are multiple allocations possible. If total sensing time $L = 180ms$ and total no. of bands $M = 9$. In conventional solution $20ms$ time will be allocated to each band. With our approach Diophantine equation $18T_1 + 72d = 360$ leads to:
Band $\{T_1, d\}$ | i | ii | iii | iv | v | vi | vii | viii | ix
{4,4} | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36
{8,3} | 8 | 11 | 14 | 17 | 20 | 23 | 26 | 29 | 32
{12,2} | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28
{16,1} | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24
Similarly if the sensing times are in G.P. and total sensing time $L = 341$ms and number of bands $M = 5$, the possible allocations are
Band $\{T_1, d\}$ | i | ii | iii | iv | v
{1,4} | 1 | 4 | 16 | 64 | 256
{11,2} | 11 | 22 | 44 | 88 | 176
Time Optimization in Spectrum Sensing: Inte
ICRITO, 2017
6 / 15
VRSEC ECE Department's screen

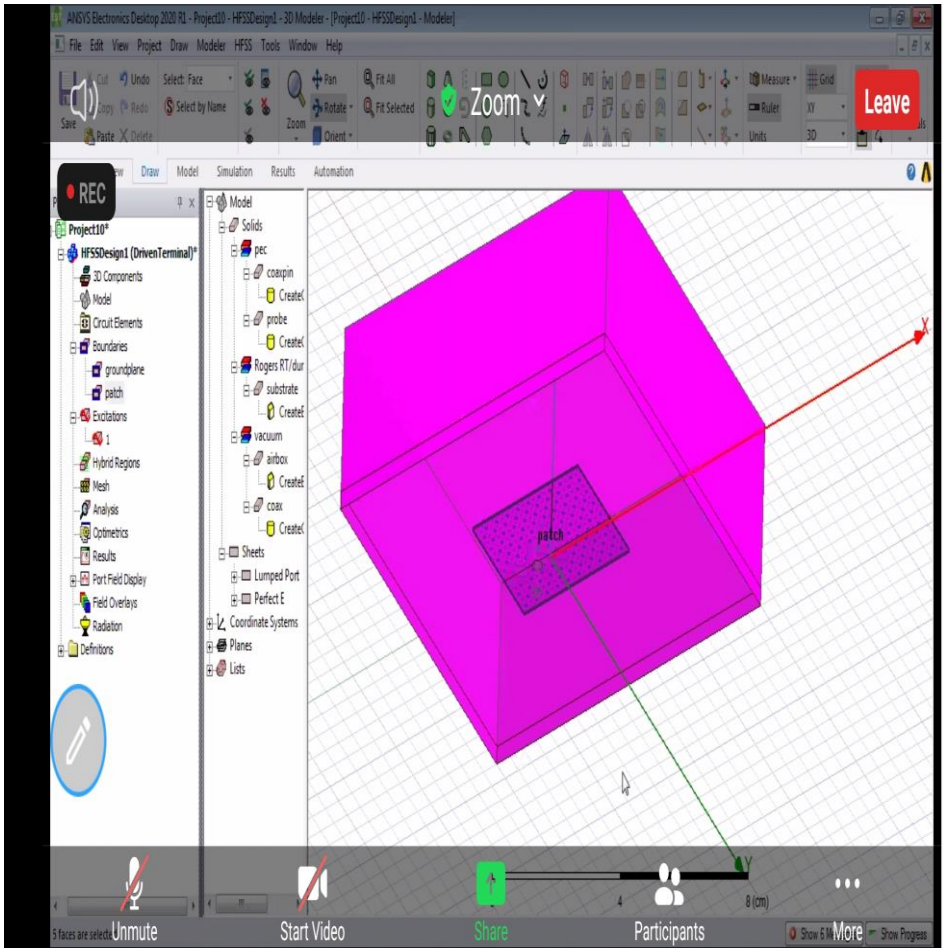


Day-3 Session 5

Er. Shashikumar R Application Engineer Entuple Technologies, Bangalore presented about "**Design of Microstrip Patch Antenna using Probe feed using HFSS"**

He deliberated about

- Theoretical concept of microstrip antenna.
- Comparison of different feed technique.
- Design and implementation of reconfigurable antenna.


ANSYS Electronics Desktop 2020 R1 - Project10 - HFSSDesign1 - 3D Modeler - [Project10 - HFSSDesign1 - Modeler]
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Project10*
HFSSDesign1 (DrivenTerminal)*
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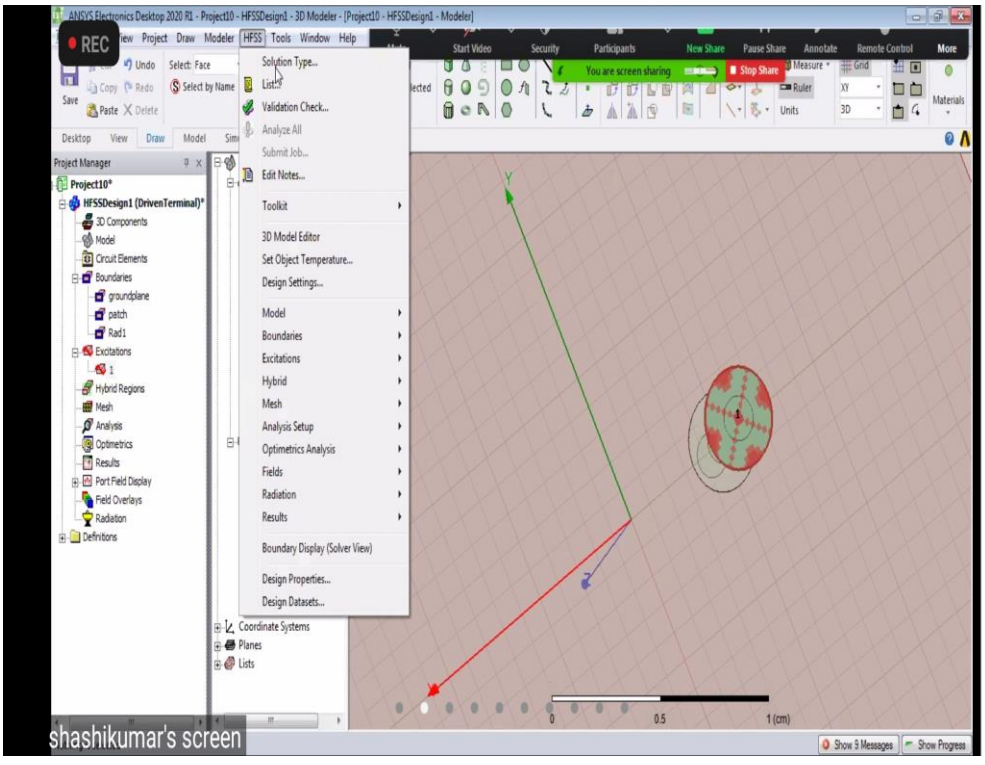
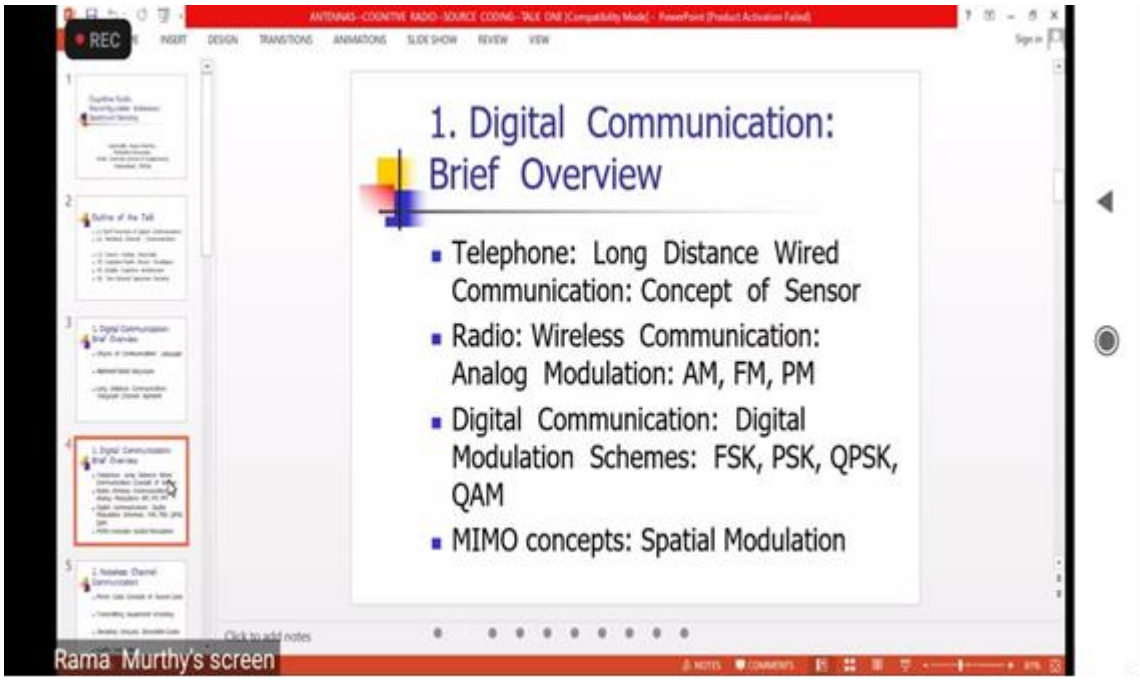

ANSYS Electronics Desktop 2020 R1 - Project10 - HFSSDesign1 - 3D Modeler - [Project10 - HFSSDesign1 - Modeler]
REC
HFSS
Solution Type...
Validation Check...
Edit Notes...
Toolkit
3D Model Editor
Set Object Temperature...
Design Settings...
Model
Boundaries
Excitations
Hybrid
Mesh
Analysis Setup
Optimetrics Analysis
Fields
Radiation
Results
Boundary Display (Solver View)
Design Properties...
Design Datasets...
You are screen sharing
Stop Share
shashikumar's screen

Day-3 Session 6

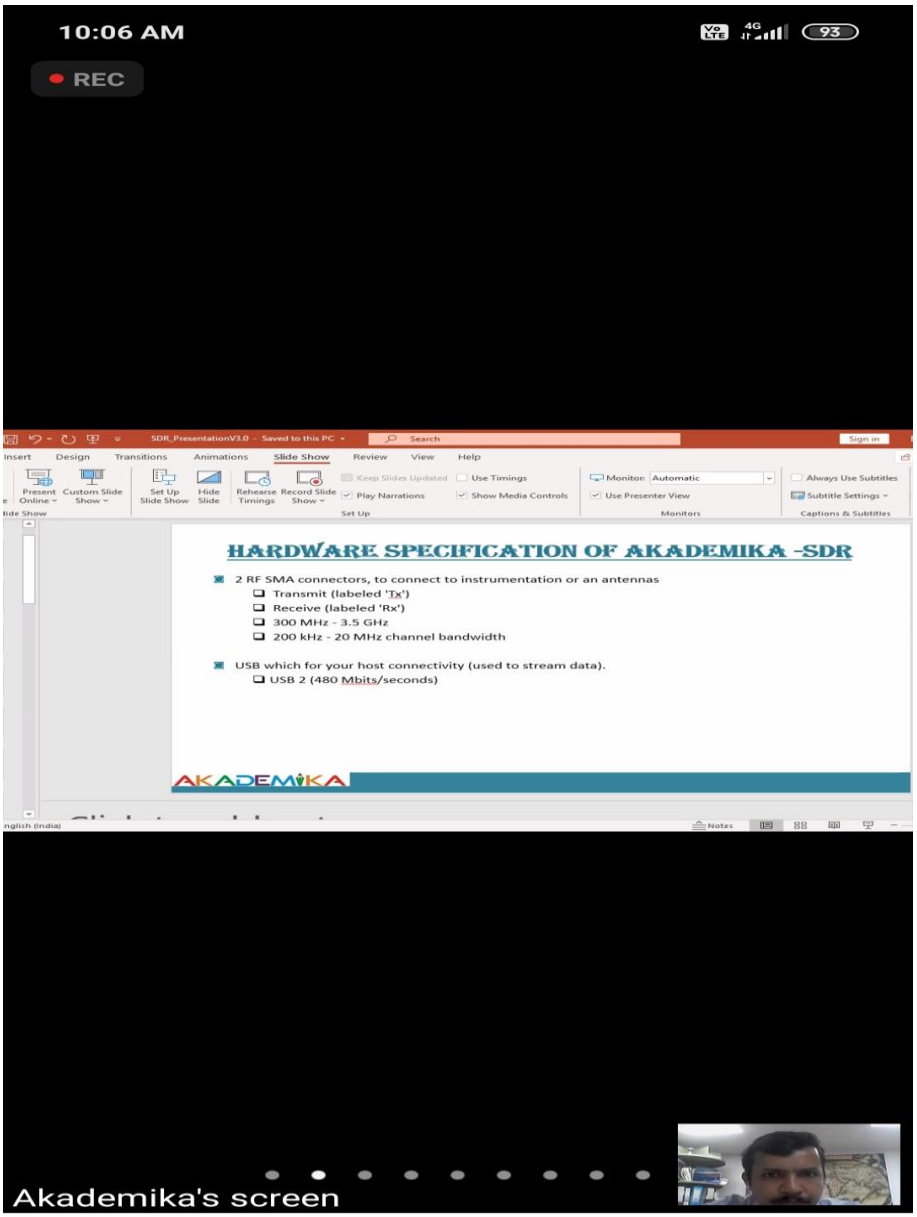
Dr. G. Rama Murthy, Professor Dept. of CSE, Mahindra University, Hyderabad his talk on Increased "Spectrum Access for wireless communication**",**



Day4 Session 7

Mr Hemant Katakkar, Director. Technical, Akademika presented his talk on "SDR – Fundamentals, Hardware Configuration".

- Basics of software defined radio
- Understanding USB
- How to make a complex signal?
- USRP Architecture-receiver



UNDERSTANDING - USB

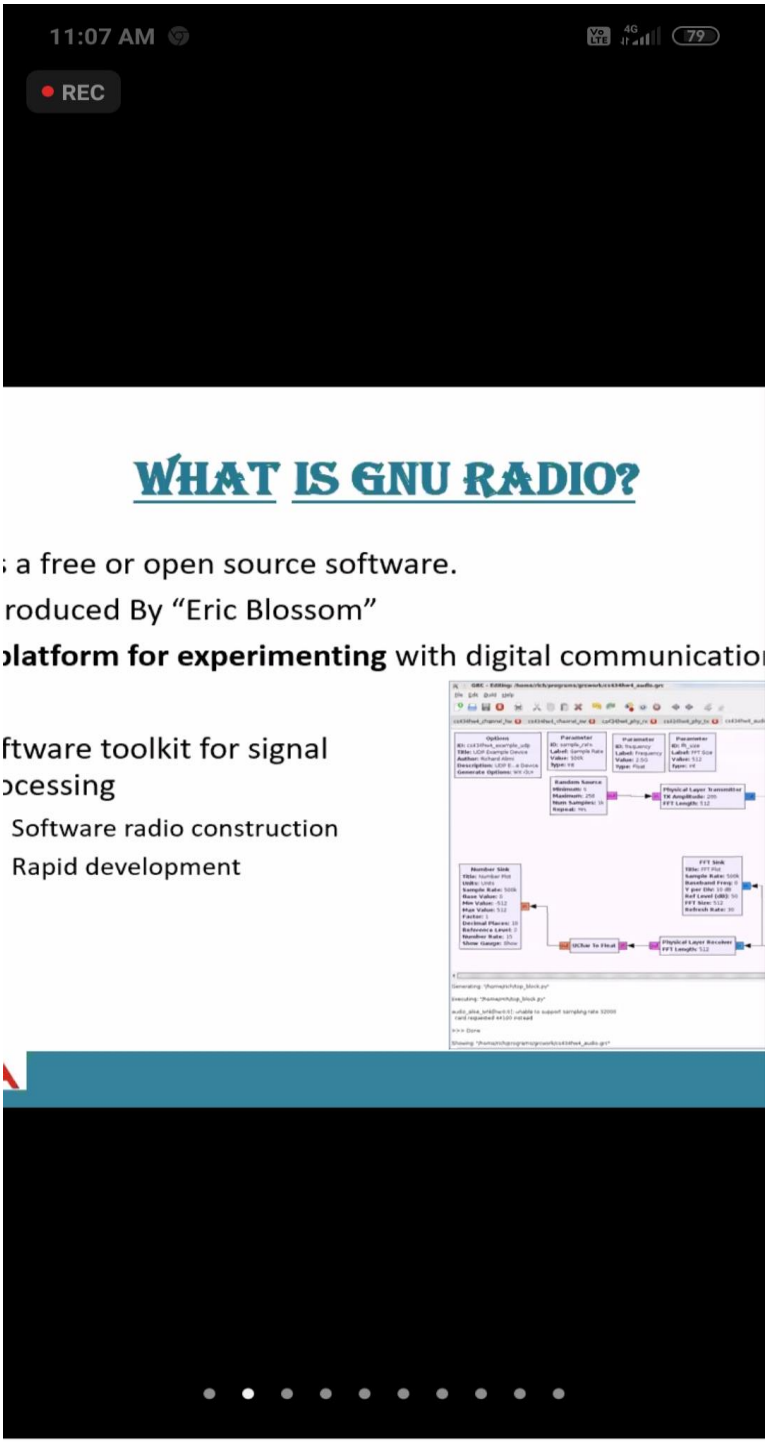
- In our SDR we have used USB 2.0 with 480 Mbit/s transfer rate and half-duplex serial mode.
- Assuming 100% utilization, 480 Mbits/s would be 60 Mbytes/second.
- Generally -at least 10-15% 60 MB/s (480 Mbit/s) goes to overhead — the communication protoc between the card and the peripheral.
- This would bring things down to ~50 Mbytes/second.
- There are Control Transfers, Interrupt Transfers, Isochronous Transfers, and Bulk Transfers. We us bulk, but you can't turn off the others, so you loose another 10% overhead, this brings things dov to ~45 Mbytes/second
- Since it is half duplex, that would be ~22.5 Mbytes/second for transmission, and ~22.5 Mbytes/second for reception.
- Since each sample is two bytes (12-bit samples), that would be ~11 MSamples/second.

Day4 Session 8

Mr Shankar Nair, Director, Sales & Marketing Akademika presented his talk on "GNU Radio,"

He deeply explained about

- GNU radio software
- Methodology of design
- Simulate it for implementation

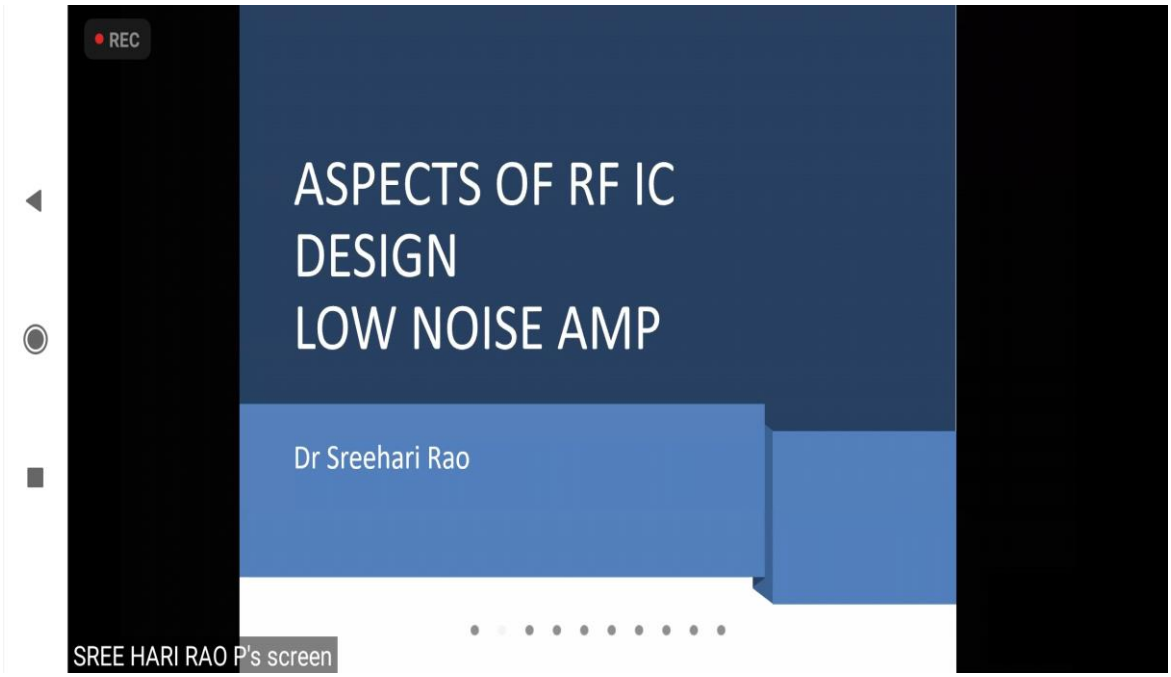


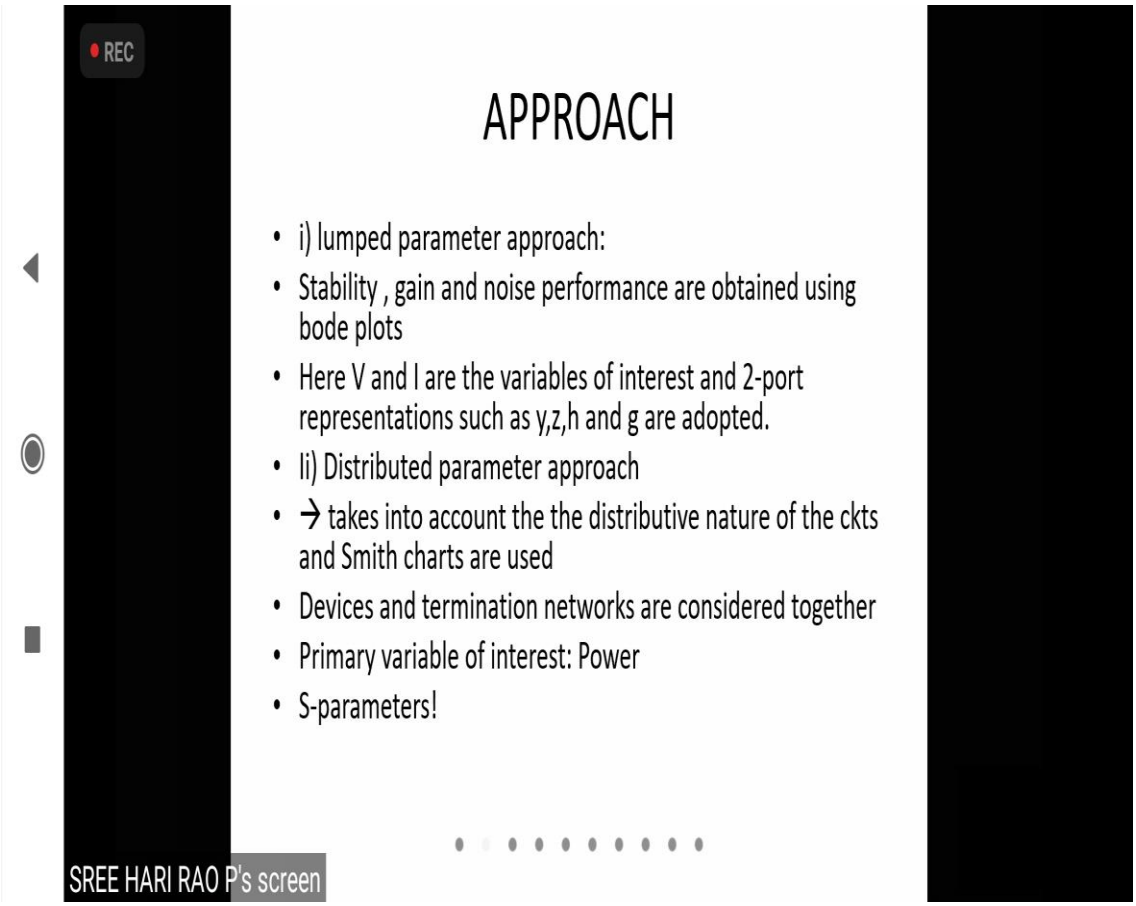
Day 5 Session 9

Dr.P. Sreehari Rao , Assoc. Prof, NITW, Waranga his talk on "Aspects of RF IC design"

He explained about

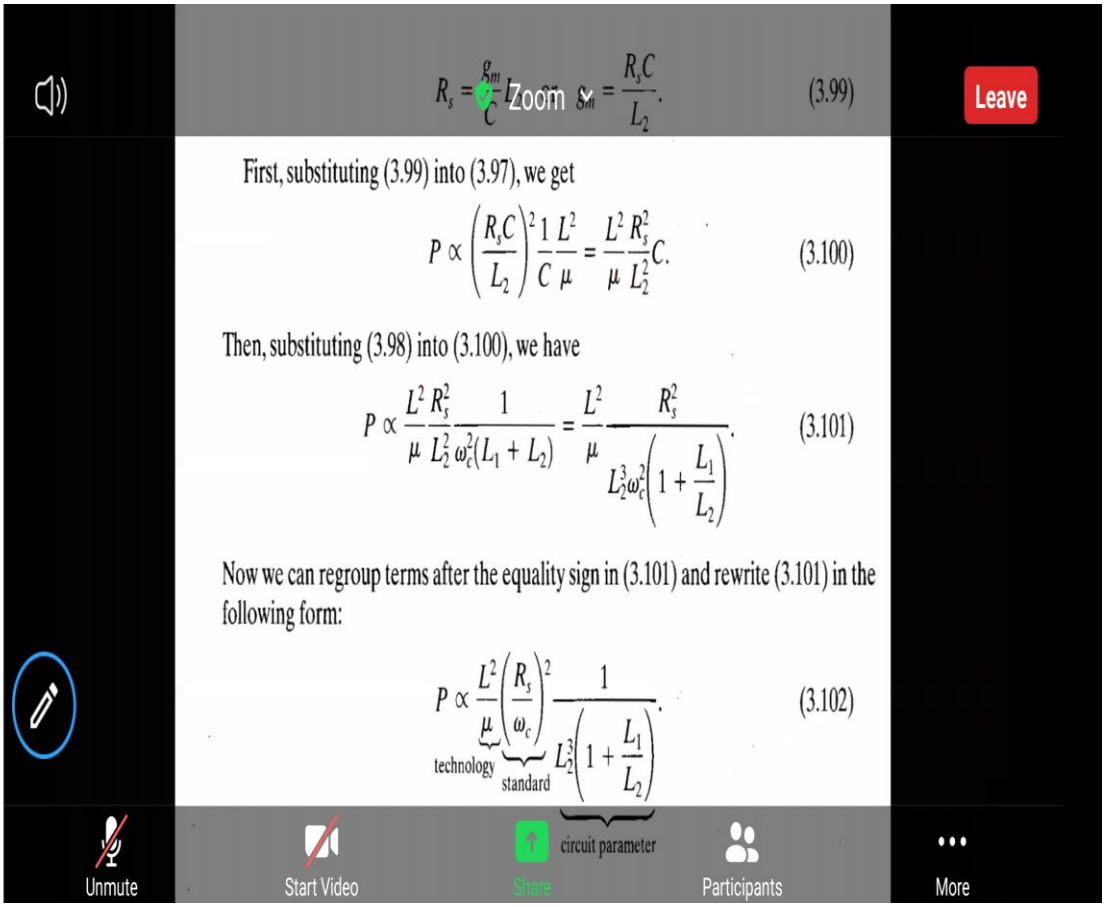
- Approach of RF IC design
- Why s-parameters?
- LNA using lumped representation.
- Objectives of matching networks.





WB LNA

- WB LNA: a general wideband amplifier is to be designed
- BPF is to be placed at its o/p
- Adv: the design work is divided in to 2 independent steps: fewer variables..constraints
- BPF with accurate center freq is easier
- Disadv: Power monger
- → performance especially noise perf is POOR!



$$R_s = \frac{g_m}{C} L \qquad g_m = \frac{R_s C}{L_2}. \tag{3.99}$$

First, substituting (3.99) into (3.97), we get

$$P \propto \left(\frac{R_s C}{L_2}\right)^2 \frac{1}{C}\frac{L^2}{\mu} = \frac{L^2}{\mu}\frac{R_s^2}{L_2^2} C. \tag{3.100}$$

Then, substituting (3.98) into (3.100), we have

$$P \propto \frac{L^2}{\mu}\frac{R_s^2}{L_2^2}\frac{1}{\omega_c^2(L_1 + L_2)} = \frac{L^2}{\mu}\frac{R_s^2}{L_2^3\omega_c^2\left(1 + \frac{L_1}{L_2}\right)}. \tag{3.101}$$

Now we can regroup terms after the equality sign in (3.101) and rewrite (3.101) in the following form:

$$P \propto \underbrace{\frac{L^2}{\mu}}_{\text{technology}} \underbrace{\left(\frac{R_s}{\omega_c}\right)^2}_{\text{standard}} \underbrace{\frac{1}{L_2^3\left(1 + \frac{L_1}{L_2}\right)}}_{\text{circuit parameter}}. \tag{3.102}$$

Day 5 Session 10

Er. M.Vinoth Manoharan , Co-Founder & CTO Wilma Communications Groups (Asia | US | Europe)

presented his talk on "Challenges in Reconfigurable antenna design".

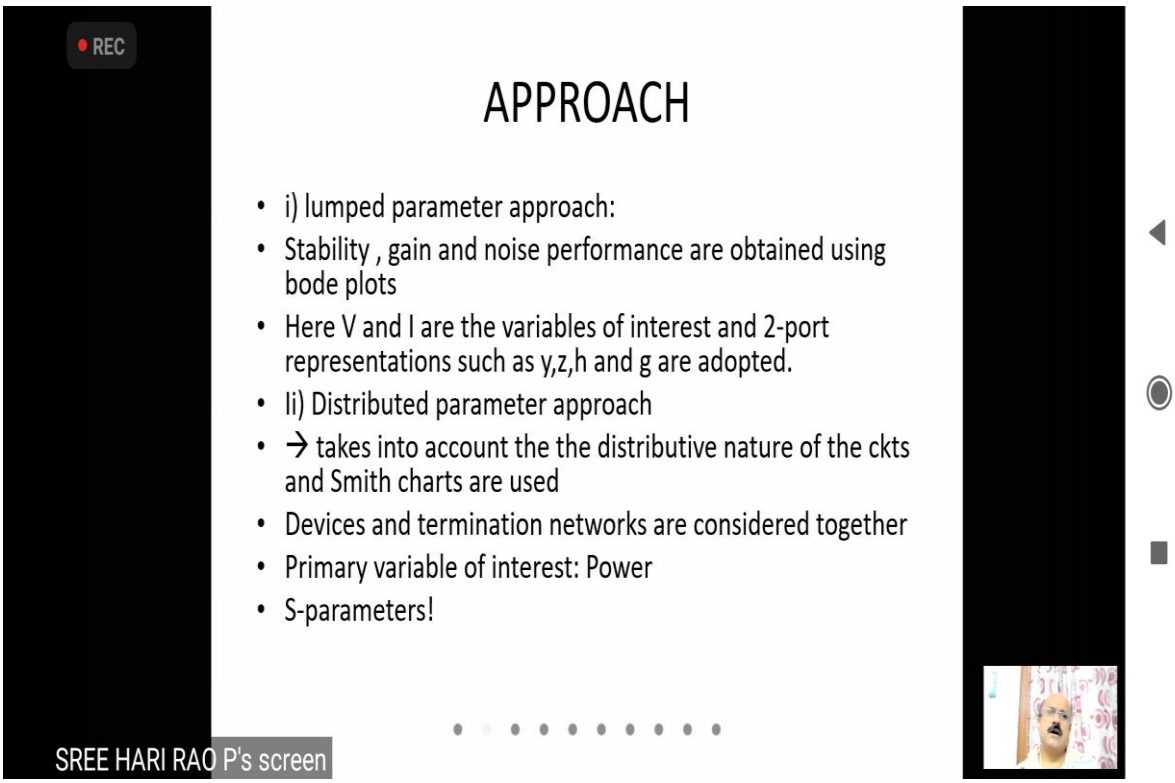
- Modes of antenna design.
- Modes of EM solver analysis.
- Reconfigurable antenna.
- Types of Reconfigurable antenna.
- Necessity of Reconfigurable antenna.

Day6 Session 11

- **Dr. Abhinav Kumar,** Associate Professor, Department of Electrical Engg., IIT Hyderabad,

Presented his talk on "Cellular networks operation on the unlicensed spectrum

- 5G
- Spectrum bands.
- Modes.
- LAA-LBT.
- CSAT.
- Existing hardware implementations.

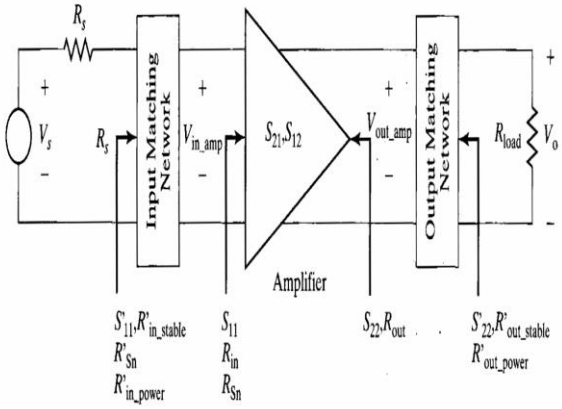


REC

- The general topology can be broken into
- i) I/P matching network
- Ii) the amplifier itself
- Iii) O/P matching network

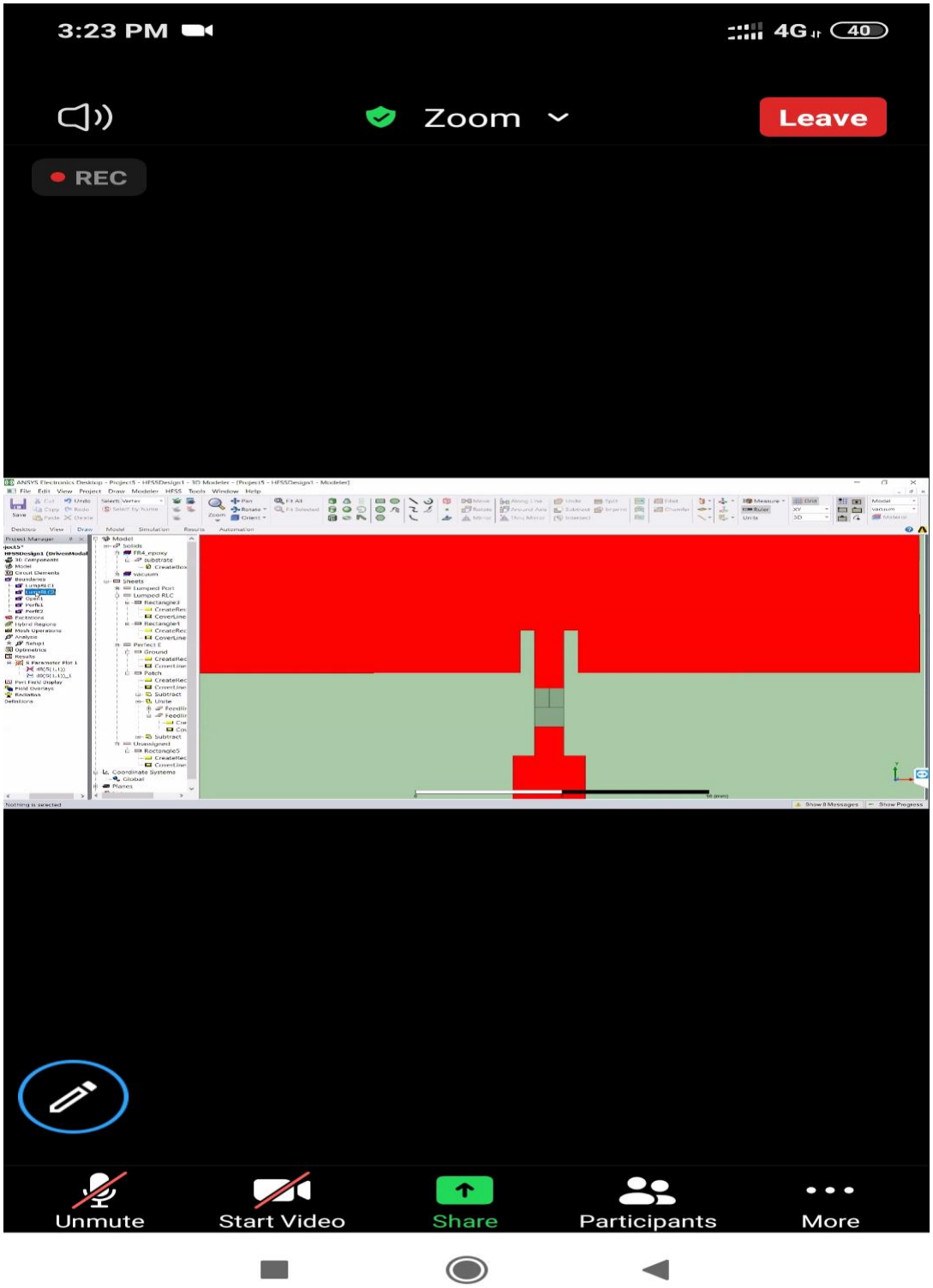
SREE HARI RAO P's screen

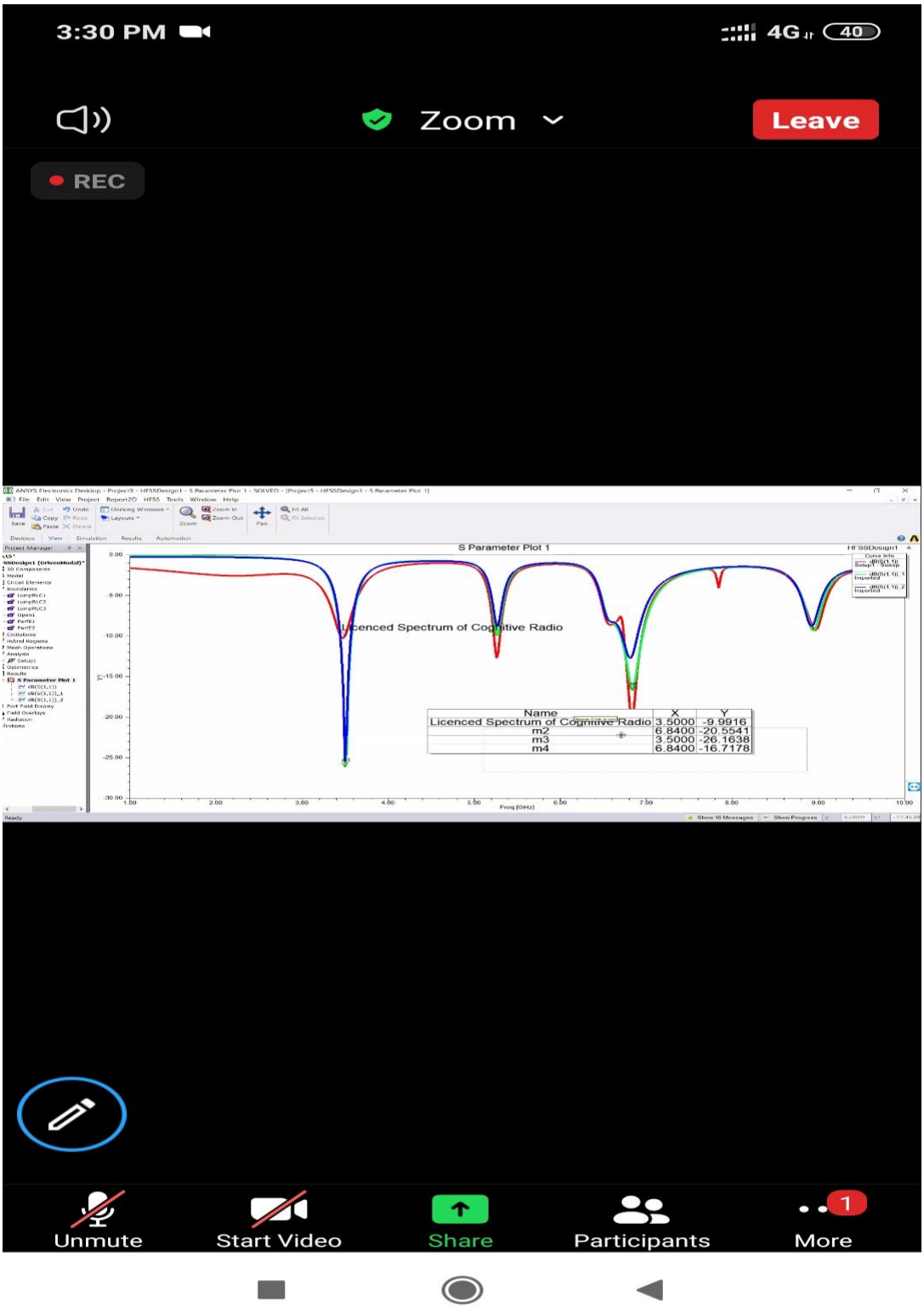
REC

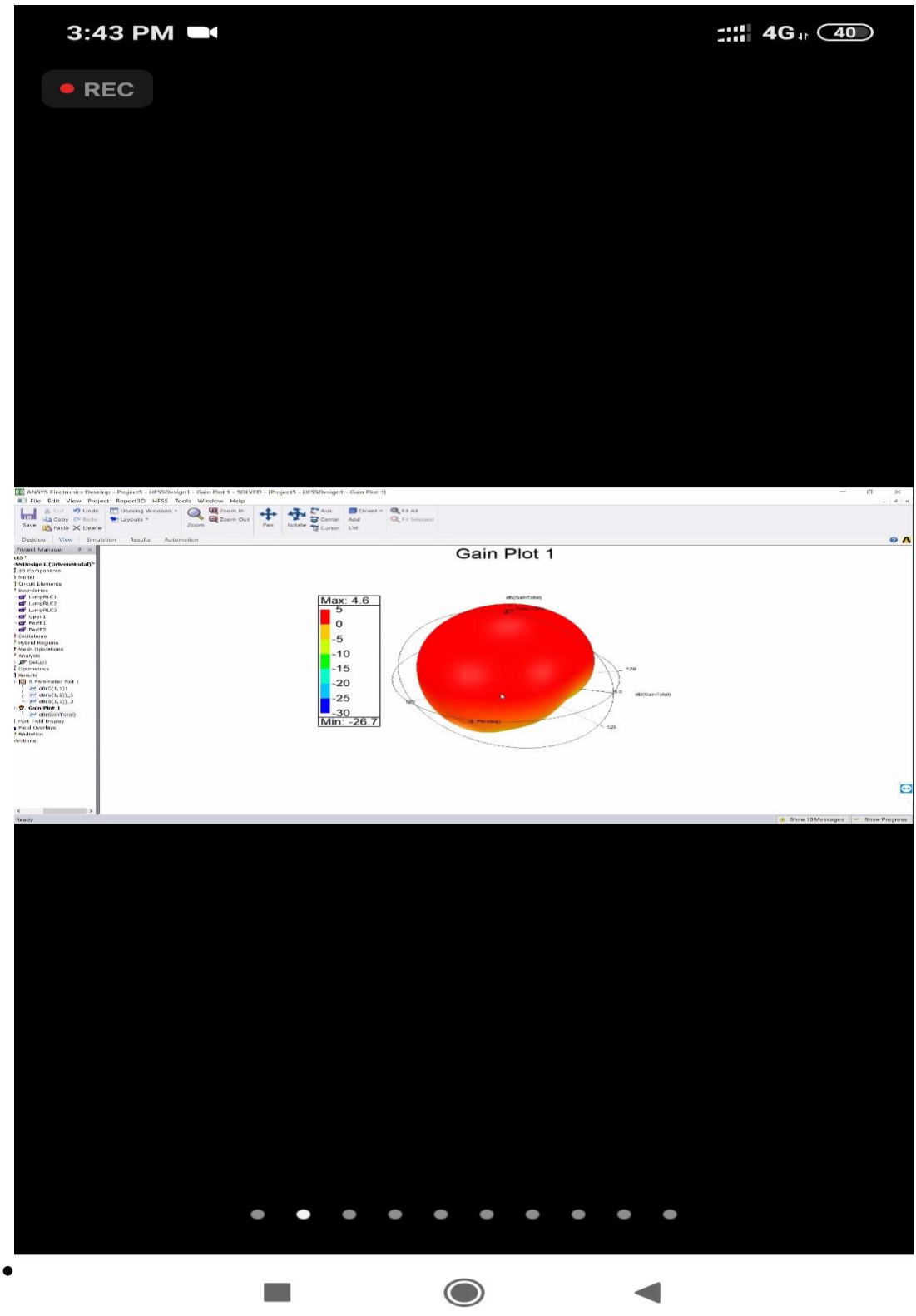


demonstrated “Application about Reconfigurable antenna in Cognitive radio Communication”

- Design and simulation of Reconfigurable antennas.
- Result analysis.




3:30 PM
4G
40
Zoom
Leave
REC
S Parameter Plot 1
Licenced Spectrum of Cognitive Radio
Name
X
Y
Licenced Spectrum of Cognitive Radio 3.5000 -9.9916
m2 6.8400 -20.5541
m3 3.5000 -26.1638
m4 6.8400 -16.7178
Unmute
Start Video
Share
Participants
More
1



At the end **Dr. M.Padmaja,** one of the coordinator of STTP offered a vote of thanks and we conducted the online exam to the participants and issued e-certificates to the all eligible participants.