



# **KONERU LAKSHMAIAH EDUCATION FOUNDATION**

(Deemed to be University, Estd. u/s 3 of UGC Act, 1956)  
Greenfields, Vaddeswaram-522502, Guntur Dt, A P, INDIA.

## **A Report On**

**Online National Level Webinar**

## **Speaker**

**Dr. M. Kamaraju**

**Professor-ECE & Director (AS-A),  
Seshadri Rao Gudlavalleru Engineering College, A.P**

## **Talk Topic**

**Low Power VLSI Design Challenges: A View**

## **Date and Time**

**March 16, 2024 - From 2:00 PM to 3:30 PM**

## **Venue / Online Webinar Link**

**<https://meet.google.com/avs-yits-mnu>**

## **Conveners**

**Dr. Fazal Noorbasha & Dr. K. Hari Kishore**

## **Co-Convener**

**Dr. K. Girija Sravani**

## **Chair**

**Dr. K. Srinivasa Rao**

## **Co-Chair**

**Dr. Venkata Ratnam D**

## **General Chair**

**Dr. Suman Maloji**

## **Organized by**

**VLSI & Microelectronics Research Group  
Department of Electronics and Communication Engineering,  
K L University,  
Vaddeswaram, Tadepalli, Guntur, AP, Inda.**

## 1. Introduction

The National Level Webinar on "Low Power VLSI Design Challenges: A View" was conducted by the VLSI & Microelectronics Research Group, Department of Electronics and Communication Engineering (ECE), K L University, Vaddeswaram. The webinar aimed to address contemporary challenges and advancements in low-power VLSI design, organized on March 16, 2024, from 2:00 PM to 3:30 PM.

## 2. Speaker and Topic

The keynote address was delivered by Dr. M. Kamaraju, Professor-ECE & Director (AS-A) at Seshadri Rao Gudlavalluru Engineering College, A.P. His presentation focused on "Low Power VLSI Design Challenges: A View," providing insights into the complexities and strategies of low-power VLSI design.

## 3. Organizers

The webinar was organized by the VLSI & Microelectronics Research Group, ECE, with Dr. Fazal Noorbasha and Dr. K. Har Kishore serving as conveners, and Dr. K. Girija Sravani as the Co-Convenor. Dr. K. Srinivasa Rao and Dr. Venkata Ratnam D acted as Chair and Co-Chair, respectively, while Dr. Suman Maloji served as the General Chair.



**WEBINAR SPEAKER**  
Dr. M Kamaraju



**GENERAL CHAIR**  
Dr. Suman Maloji



**CHAIR**  
Dr. K. Srinivasa Rao



**CO CHAIR**  
Dr. Venkata Ratnam D



**CONVENER**  
Dr. Fazal Noorbasha



**CONVENER**  
Dr. Kakarla Hari Kishore



**CO CONVENER**  
Dr. K Girija Sravani

#### **4. Key Highlights**

- Dr. Kamaraju elucidated the significance of low-power VLSI design in contemporary electronics, emphasizing its importance in energy-efficient systems.
- Various techniques including voltage scaling, clock gating, power gating, and dynamic voltage and frequency scaling (DVFS) were discussed.
- The presentation included practical case studies illustrating the application of low-power design techniques, showcasing their effectiveness without compromising performance.
- Emerging trends such as the integration of machine learning algorithms and exploration of novel materials for energy-efficient circuit implementation were also highlighted.

#### **5. Conclusion**

The webinar provided valuable insights into the challenges and opportunities in low-power VLSI design, inspiring further research and innovation in the field. Dr. Kamaraju's expertise contributed significantly to the academic discourse, fostering knowledge dissemination and academic growth.

#### **6. Acknowledgments**

The organizers express their gratitude to Dr. M. Kamaraju for his insightful presentation and to all participants for their active engagement. Special thanks are extended to the conveners, chairpersons, and the organizing committee for their efforts in making the webinar a success.

This report encapsulates the essence of the National Level Webinar, reflecting the collaborative efforts of the VLSI & Microelectronics Research Group at K L University in advancing knowledge in VLSI design.

## Appendix

### A. Webinar advertisement Link:

<https://www.kluniversity.in/pdfs/National-Webinar-Low-Power-VLSI-Design-Challenges.pdf>

The screenshot shows the homepage of K L University. At the top, the university's name and logo are displayed. Below the navigation menu, there is a prominent banner for admissions. The banner features the text: "Your Road to Success Begins Here B.Tech, UG & PG ADMISSIONS OPEN 2024-25 5000+ Students Placed in 300+ Companies in 2023". There is also a "National Webinar (Online) on 'Low Power VLSI Design Challenges: A View' - March 16, 2024, 2PM to 3.30PM" notification. A group of students is shown on the right side of the banner, and an "Enquire Now" button is visible.

### B. Webinar Brochure:

The brochure is for a National Webinar titled "Low Power VLSI Design Challenges :A view". It is scheduled for Saturday, March 16, 2024, from 2.00PM to 3.30 PM. The speaker is Dr. M Kamaraju, Professor – ECE & Director (AS&A) at Seshadri Rao Gudlavalluru Engineering College – A.P., India. The brochure includes details about the university, the department of electronics and communication engineering, and the VLSI & Microelectronics Research Group. It also provides information about the webinar's overview, target audience, registration link, and the organizing group.

**K L University**  
(Deemed to be University Estd. u/s. 3 of the UGC Act. 1956)  
Koneru Lakshmaiah Education Foundaion

**National Webinar**  
**Low Power VLSI Design Challenges :A view**  
On  
**Saturday, March 16, 2024 – 2.00PM to 3.30 PM**  
By  
**Dr. M Kamaraju**  
**Professor – ECE & Director (AS&A)**  
**Seshadri Rao Gudlavalluru Engineering College – A.P., India**

**KONERU LAKSHMAIAH EDUCATION FOUNDATION**  
KLEF Deemed to be university was established in 1980-81, as KL College of Engineering, which was upgraded to KL College of Engineering Autonomous in 2006 by UGC, and was declared as a Deemed to be University in 2009 by UGC, MHRD Govt of India. In 2012 as a Deemed to be University the institution was accredited by NAAC with A Grade and later in 2018, was re-accredited by NAAC with A++ grade. In 2019 UGC, MHRD declared this institution as Category I Institution. The institutes remains indebted to leadership of our late co-founder Er.Koneru Lakshmaiah, and our Founder Er.Koneru Satyanarayana, both of whose vision has helped in creating this abode of learning, which has emerged as one of the elite institutes of the nation.

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**  
Established in the year 1983, the Department of ECE enjoys the support of 248 distinguished faculty members, specialized in core areas of ECE. 87 out of them have PhD degrees and 121 they are pursuing PhD. The department houses faculty that has rich industry experience to cater to the industry and academic needs of the students. With the state of the Art laboratories, Centers of Excellence and Research Centers, the department of ECE is equipped with the sophistication of the highest order to meet the needs of our UG, PG and PhD students.  
With a special emphasis on R&D activities, we have placed all the latest software tools available to the students to explore beyond the curriculum and experiment on innovative ideas. The Department has 136million (13.65 Crore) worth of Sponsored projects from DST, DLRL, ISRO, DEAL etc. Our faculty has published research in 3000+ International Journal, 600+ International Conference papers and 150+ National Conference.

**VLSI & MICROELECTRONICS RESEARCH GROUP**  
Started in the year 2011 by Dr. Fazal Noorbasha, The VLSI & Microelectronics Research Group within the ECE (Electronics and Communication Engineering) department focuses on advancing microelectronics technology through research in integrated circuit design, semiconductor device physics and system-level integration. Collaborating with industry partners and utilizing state-of-the-art facilities, the group investigates topics such as low-power design, emerging technologies, and design automation. Through publications, conferences, and educational initiatives, it contributes to both theoretical knowledge and practical applications in areas like telecommunications, healthcare, and automotive electronics. Funded by grants and industry contracts, the group plays a pivotal role in shaping the future of VLSI and microelectronics, bridging academia and industry for innovation and technological advancement.

**CHIEF PATRONS**  
Er. K. Satyanarayana, President, KLEF  
Er. K. L. Havish, Vice-President, KLEF  
Er. K. Raja Harin, Vice-President, KLEF

**PATRONS**  
Dr. K.S.Jagannatha Rao, Chancellor, KLEF  
Dr. G.P. Saradhi Varma, Vice-Chancellor, KLEF  
Dr. N. Venkatram, Pro-Vice Chancellor (Administration), KLEF  
Dr. A.V.S Prasad, Pro-Vice Chancellor (Academics), KLEF  
Dr. K. Subbarao, Registrar, KLEF  
Dr. T. K. Rama Krishna Rao, Principal, K. L. College of Engineering, KLEF

**GENERAL CHAIR**  
Dr. Suman Maloji, Professor & HOD-ECE/Vice Principal (CoE), KLEF

**CHAIR**  
Dr. K. Srinivasa Rao, Professor & Addtl. HOD, Group Head –VLSI&ME, ECE, KLEF

**CO CHAIR**  
Dr. Venkata Ratnam D, Professor & HoD Research – ECE, KLEF

**CONVENERS**  
Dr. Fazal Noorbasha, Assoc. Professor-ECE & Associate Dean (Academics), KLEF  
Dr. Kakarla Hari Kishore, Professor-ECE & Associate Dean (SA), KLEF

**CO-CONVENER**  
Dr. K. Girija Sravani, Associate Professor, ECE, KLEF

**ADVISORY COMMITTEE**  
Dr. A. S. Chandra Sekhara Sastry, Professor-ECE & CoE, KLEF  
Dr. V. Rajesh, Professor-ECE & Dean (P&D), KLEF  
Dr. K. Sarat Kumar, Professor-ECE, Director (R&D Placements), KLEF  
Dr. K. Ch. Sri Kavya, Professor-ECE, Director (Alumni), KLEF  
Dr. B. T. P. Madhav, Professor-ECE, Director (Academic Research), KLEF  
Dr. J. Govarhini, Professor-ECE, Principal (ASC), KLEF  
Dr. M. Venkata Narayana, Professor-ECE, Director (Placements), KLEF  
Dr. P.V.V. Kishore, Professor-ECE, Research Group Head, KLEF  
Dr. M. Siva Gangi Prasad, Professor-ECE, & Coordinator FED, KLEF  
Dr. G. V. Subbarao, Professor, ECE, KLEF  
Dr. K. Kumar Naik, Professor, ECE, KLEF  
Dr. Md. Zia Ur Rahman, Professor, ECE, KLEF  
Dr. M. Sridhar, Professor, ECE, KLEF

**OVERVIEW OF THE WEBINAR**  
In this technical webinar, we will review the latest technologies in the VLSI design and explain how they are leveraged with the Software/Hardware. These technologies widely used in the Digital, Analog, Mixed Signal fields and more, where high real time performance, reliability and safety is required.

**TARGET AUDIENCE**  
For those who want to acquire basic knowledge on the various Low Power VLSI designs and seeking help in getting prepared for industry and research.

**Registration Link:**  
<https://forms.gle/eAw8fayWP9Qj4YA>

**Webinar Link:**  
<https://meet.google.com/avs-yits-mnu>

**Organized by:**  
VLSI & Microelectronics Research Group,  
Department of ECE, K L University,  
Green Fields, Vaddeswaram, Tadepalli, Guntur,  
AP, India

**Conduction of National Level Webinar (Online) on 16-03-2024 by VLSI & Microelectronics Research Group, Department of ECE, KLEF, Vaddeswaram – Communication - Reg.**

Registrar <registrar@kluniversity.in>

Fri 15-03-2024 12:23

To: Dean Academics <dean.academics@kluniversity.in>; Dean (R & D) <deanrnd@kluniversity.in>; Dean P & D <deanpnd@kluniversity.in>; Dean Student Affairs <deansa@kluniversity.in>; Dean Quality <deanquality@kluniversity.in>; Dean Faculty & Staff Affairs <deanfsa@kluniversity.in>; Dean - Skill Development <deanskill@kluniversity.in>; Dean Skill & Student Progression <deansdnsp@kluniversity.in>; Dean- MHS <deanmhs@kluniversity.in>; Dean Placements and Progression <deanplacement@kluniversity.in>; Addl. Dean-Academics <addl.deanacademics@kluniversity.in>; PRINCIPAL - COE <principal.coe@kluniversity.in>; Principal-ASC <principal.asc@kluniversity.in>; Pricipal K L Pharmacy College <principal.pharmacy@kluniversity.in>; PRINCIPAL - SCIENCES <principal.cos@kluniversity.in>; PRINCIPAL LAW <principal.law@kluniversity.in>; Vice Principal K L College of Engineering <viceprincipal.coe@kluniversity.in>; Coordinator-FED <coordinator.fed@kluniversity.in>; HOD AI&DS <hod.aids@kluniversity.in>; HOD-BT <hod.bt@kluniversity.in>

📎 1 attachments (134 KB)

National Webinar -brochure 16-3-2024.pdf;

Ref: KLEF/RO/ECE/Webinar/2023-24

Date: 15-03-2024

**Orders of the Hon'ble Vice-Chancellor dt. 15-03-2024**

**CIRCULAR**

Sub: Conduction of National Level Webinar (Online) on 16-03-2024 by VLSI & Microelectronics Research Group, Department of ECE, KLEF, Vaddeswaram – Communication - Reg.

Ref: Letter from Dr.Fazal Noorbasha, Associate Professor, ECE and forwarded by Dr.M. Suman, HoD-CSE.

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This is to inform that the VLSI & Microelectronics Research Group, Department of ECE is conducting a National Webinar (Online) on "**Low Power VLSI Design Challenges: A View**", as detailed below:

**Webinar Details are:**

|                   |   |  |
|-------------------|---|--|
| Speaker           | : | <b>Dr.M. Kamaraju</b> , Professor-ECE & Director (AS-A),<br>Seshadri Rao Gudlavalleru Engineering College, A.P |
| Title of the Talk | : | Low Power VLSI Design Challenges: A View   |
| Organized by      | : | Microelectronics & VLSI Research Group, ECE  |
| Date and Time     | : | <b>16.03.2024 - From 2.00 PM to 3.30 PM</b>  |
| Registration Link | : | <b><a href="https://forms.gle/eAw8fayWP9QpJq4YA">https://forms.gle/eAw8fayWP9QpJq4YA</a></b>                   |
| Webinar Link      | : | <b><a href="https://meet.google.com/avs-yits-mnu">https://meet.google.com/avs-yits-mnu</a></b>                 |

Conveners : Dr.Fazal Noorbasha & Dr.K.Hari Kishore  
Co Convener : Dr.K.Girija Sravani  
Chair : Dr.K.Srinivasa Rao  
Co Chair : Dr. Venkata Ratnam D  
General Chair : Dr. Suman Maloji

Relevant brochure is attached herewith.

The HoDs / Functionaries are requested to ensure that this information is brought to the notice of all the Faculty members, Research Scholars and Students of their respective departments.

## REGISTRAR

Encl: as above

Mail & Hard copy to: Hon'ble President, KLEF

Mail to: Hon'ble Vice-Presidents, KLEF

Mail & Hard copy to: Hon'ble Pro Chancellor

Mail & Hard copy to: Hon'ble Vice-Chancellor

Mail & Hard copy to: Pro Vice-Chancellors

Mail to: Chief Coordinating Officer-Dr.A. Jagadeesh

Mail to: Special Officer -Dr.A. Vani

Mail to: All Advisors / All Deans / All Principals / All Vice-Principals / All Sr.Directors / All Directors / All Additional Deans /  
All Associate Deans / Deputy Deans / PR Head

Mail to: Controller of Examinations-Dr.A.S.C.S.Sastry

Mail to: Joint Registrar / Deputy Registrar / Sr.Manager (Alumni Relations) & AR-Sri A.Krishna Rao / AR-Dr.MVAL Narasimha Rao

Mail to: Advisor – NAAC & Hyderabad Operations - Prof. K.Koteswara Rao

Mail to: Principal-CoE..Dr.T.K. Rama Krishna Rao / Coordinator-FED..Dr.MSG Prasad / Dy.Coordinator-FED..Dr.J.Somlal  
Vice-Principals

Mail to: All HoDs

Mail to: KL H - Principal Off Campus Centre, Aziz Nagar Campus / KL H - Principal Off Campus Centre, Bowrampet  
Vice-Principal / Director / Deputy Director

Mail to: KL H HoDs.. AI&DS / CSE / ECE / BES / FED Coordinator / Business School

Mail to: Librarians

Mail to: Webmaster-Mr.LV

Mail to: Chief Technical Officer (CTO)-Mr.A.Satya Kalyan

Mr. Raja Sekhar, Emp. No. 2482, Jr. Network Administrator (E-mail: rajasekhar\_syte@kluniversity.in)

Mail to: Professor In-charge, EduTech, Animation-Dr. M. Siva Kumar, Assoc. Professor, ECE

Mail to: Professor In-charge, Technical Maintenance / Liberal Arts Club-Dr.R Subhakara Raju

Mail to: HoD-ECE

Additional HoD-ECE

Dr.Fazal Noorbasha, Associate Professor, ECE

All Faculty

All Research Scholars

All Students

Thanks & Regards



**Dr. K. Subba Rao**  
**REGISTRAR**

**KONERU LAKSHMAIAH EDUCATION FOUNDATION**

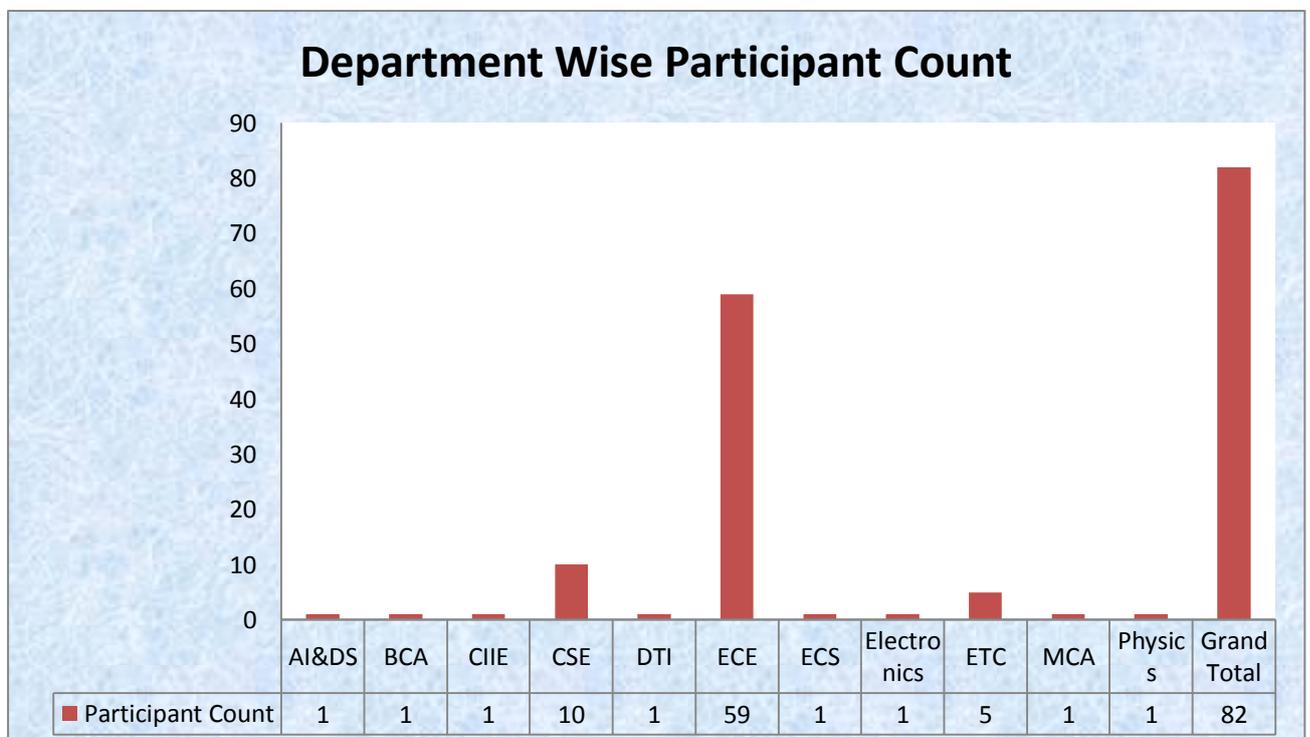
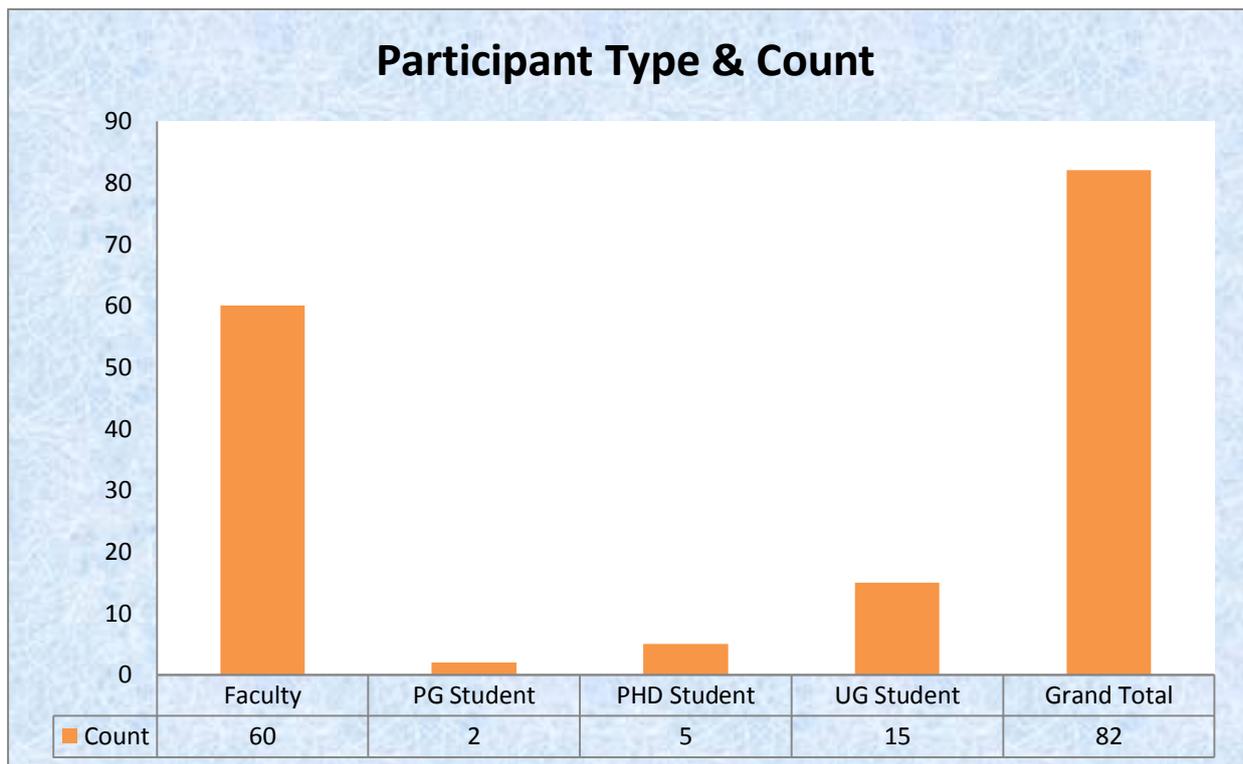
(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)  
Accredited by NAAC as 'A++' Grade University ♦ Approved by AICTE ♦ ISO 21001:2018 Certified  
Campus: Green Fields, Vaddeswaram - 522 302, Guntur District, Andhra Pradesh, INDIA.  
Phone No. 08645 - 350200; [www.klef.ac.in](http://www.klef.ac.in); [www.klef.edu.in](http://www.klef.edu.in); [www.kluniversity.in](http://www.kluniversity.in)

## D. List of Participants:

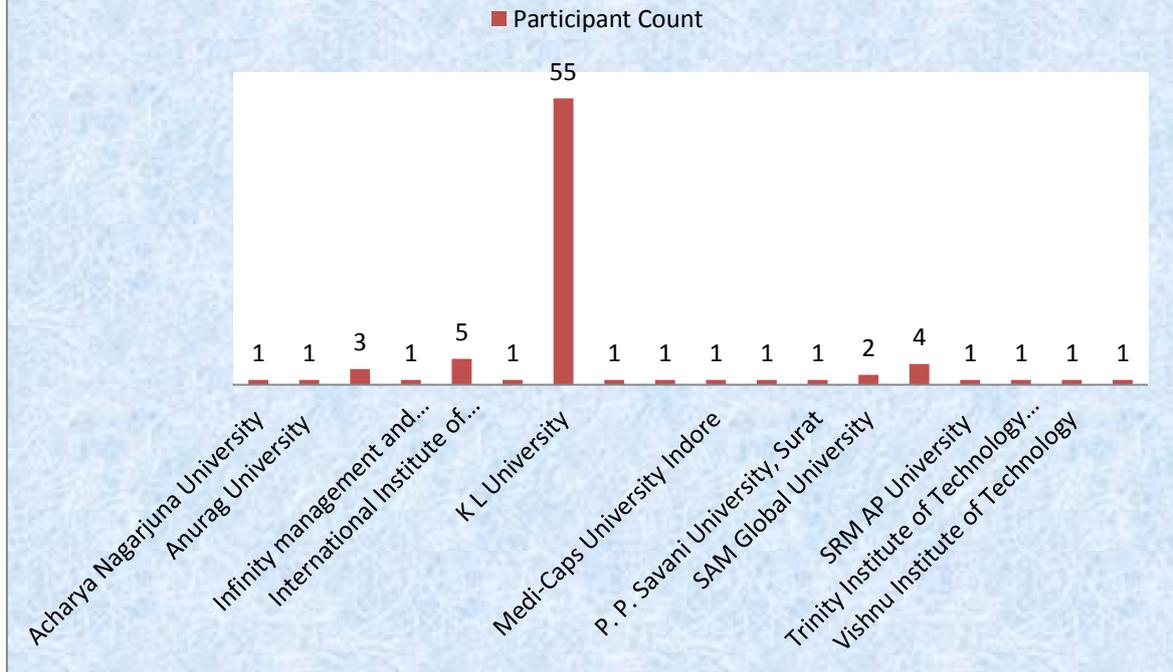
| Sl.No | Name                           | Designation   | Institute                           | State          |
|-------|--------------------------------|---------------|-------------------------------------|----------------|
| 1     | G V Subbarao                   | Faculty       | K L University                      | Andhra Pradesh |
| 2     | Dr.K.Girija Sravani            | Faculty       | K L University                      | Andhra Pradesh |
| 3     | Dr. Chella Santhosh            | Faculty       | K L University                      | Andhra Pradesh |
| 4     | Dr.UDAY KIRAN KASI             | Faculty       | K L University                      | Andhra Pradesh |
| 5     | Dr A V Prabu                   | Faculty       | K L University                      | Andhra Pradesh |
| 6     | Dr.Naren Das                   | Faculty       | K L University                      | Andhra Pradesh |
| 7     | Dr S VAMSEE KRISHNA            | Faculty       | K L University                      | Andhra Pradesh |
| 8     | Dr.M.Ravi kumar                | Faculty       | K L University                      | Andhra Pradesh |
| 9     | V.venkatanaveen                | UG Student    | K L University                      | Andhra Pradesh |
| 10    | Ramakrishna T                  | Faculty       | K L University                      | Andhra Pradesh |
| 11    | Dr. M. Sujatha                 | Faculty       | K L University                      | Andhra Pradesh |
| 12    | Dr.N Prabakaran                | Faculty       | K L University                      | Andhra Pradesh |
| 13    | Debajit Deb                    | Faculty       | K L University                      | Andhra Pradesh |
| 14    | Dr. S. Koteswara Rao           | Faculty       | K L University                      | Andhra Pradesh |
| 15    | MADEM SIVA MASTHAN REDDY       | UG Student    | K L University                      | Andhra Pradesh |
| 16    | Vijayasree                     | UG Student    | K L University                      | Andhra Pradesh |
| 17    | G Anjaneyulu                   | Ph.D. Student | SRM AP University                   | Andhra Pradesh |
| 18    | Dr. PATAN SALEEM AKRAM         | Faculty       | K L University                      | Andhra Pradesh |
| 19    | Dr. Vullanki Rajesh            | Faculty       | K L University                      | Andhra Pradesh |
| 20    | Ch.Vijay                       | Faculty       | K L University                      | Andhra Pradesh |
| 21    | Bolem Vamsy Krishna            | Faculty       | SR Gudlavalleru Engineering College | Andhra Pradesh |
| 22    | SravaniSai.Pakalapati          | UG Student    | K L University                      | Andhra Pradesh |
| 23    | M Lakshmana Kumar              | Faculty       | K L University                      | Andhra Pradesh |
| 24    | E Bhavitha                     | UG Student    | K L University                      | Andhra Pradesh |
| 25    | K Poojitha                     | Ph.D. Student | K L University                      | Andhra Pradesh |
| 26    | Dr. Sandip Swarnakar           | Faculty       | K L University                      | Andhra Pradesh |
| 27    | Bontha Koteswara Rao           | Faculty       | K L University                      | Andhra Pradesh |
| 28    | Vinay Kumar                    | UG Student    | K L University                      | Andhra Pradesh |
| 29    | G Vijay Kumar                  | UG Student    | K L University                      | Andhra Pradesh |
| 30    | Syed Inthiyaz                  | Faculty       | K L University                      | Andhra Pradesh |
| 31    | Dr. Ch . D. Umasankar          | Faculty       | Acharya Nagarjuna University        | Andhra Pradesh |
| 32    | M. Z. Rahman                   | Faculty       | K L University                      | Andhra Pradesh |
| 33    | Dr. K Hari Kishore             | Faculty       | K L University                      | Andhra Pradesh |
| 34    | T.Venkata Lakshmi              | Faculty       | SR Gudlavalleru Engineering College | Andhra Pradesh |
| 35    | Dr.Vamsidhar Enireddy          | Faculty       | K L University                      | Andhra Pradesh |
| 36    | Mr.S.V.S.N.Murthy              | Faculty       | Vishnu Institute of Technology      | Andhra Pradesh |
| 37    | N Mahaveer Singh               | Faculty       | K L University                      | Andhra Pradesh |
| 38    | U.Gnaneshwara chary            | UG Student    | K L University                      | Andhra Pradesh |
| 39    | Dr. K. Venkata Ratnam          | Faculty       | K L University                      | Andhra Pradesh |
| 40    | MOHAMMAD GANDHI BABU           | Ph.D. Student | K L University                      | Andhra Pradesh |
| 41    | Dr. K Kumar Naik               | Faculty       | K L University                      | Andhra Pradesh |
| 42    | MVD Prasad                     | Faculty       | K L University                      | Andhra Pradesh |
| 43    | P siva sai                     | PG Student    | K L University                      | Andhra Pradesh |
| 44    | Dr.Syed.Shameem                | Faculty       | K L University                      | Andhra Pradesh |
| 45    | Dr Badugu Suresh               | Faculty       | K L University                      | Andhra Pradesh |
| 46    | Dr.N.V.K.Ramesh                | Faculty       | K L University                      | Andhra Pradesh |
| 47    | Dr Nagamalli Arasavalli        | Faculty       | K L University                      | Andhra Pradesh |
| 48    | Dr. K. Rajesh Babu             | Faculty       | K L University                      | Andhra Pradesh |
| 49    | Dr G V Ganesh                  | Faculty       | K L University                      | Andhra Pradesh |
| 50    | Y Sri Chakrapani               | Faculty       | SR Gudlavalleru Engineering College | Andhra Pradesh |
| 51    | S. Rooban                      | Faculty       | K L University                      | Andhra Pradesh |
| 52    | L Swapna                       | Faculty       | K L University                      | Andhra Pradesh |
| 53    | Nanduri samba murthy           | Faculty       | SR Gudlavalleru Engineering College | Andhra Pradesh |
| 54    | Mano asif shaik                | UG Student    | VR Siddhartha engineering College   | Andhra Pradesh |
| 55    | Dr P S Srinivasa Babu          | Faculty       | K L University                      | Andhra Pradesh |
| 56    | Dr.B.Balaji                    | Faculty       | K L University                      | Andhra Pradesh |
| 57    | DR.MANCHIRAJU KAMESWARA RAO    | Faculty       | K L University                      | Andhra Pradesh |
| 58    | DR.BONDALAPU CHAITANYA KRISHNA | Faculty       | K L University                      | Andhra Pradesh |
| 59    | Dr. M Suman                    | Faculty       | K L University                      | Andhra Pradesh |

|    |                                |               |   |                |
|----|--------------------------------|---------------|---|----------------|
| 60 | DR VIDYA SAGAR PONNAM          | Faculty       | K L University  | Andhra Pradesh |
| 61 | DR.VENKATA RATNAM DEVANABOYINA | Faculty       | K L University  | Andhra Pradesh |
| 62 | DR.FAZAL NOOR BASHA            | Faculty       | K L University  | Andhra Pradesh |
| 63 | DR.KARUMURI SRINIVASA RAO      | Faculty       | K L University  | Andhra Pradesh |
| 64 | Dr. Shruti Suman               | Faculty       | P. P. Savani University, Surat                          | Gujarat        |
| 65 | SIVA KUMAR GUNTURU             | Ph.D. Student | NEW HORIZON COLLEGE OF ENGINEERING BANGALORE            | Karnataka      |
| 66 | Ritu Arya                      | PHD Student   | Dr. Harisingh Gour Vishwavidhalaya, Sagar               | Madhya Pradesh |
| 67 | Dr. Alka Dubey                 | Faculty       | Dr. Harisingh Gour Vishwavidhalaya, Sagar               | Madhya Pradesh |
| 68 | Prof. Shekhar Nigam            | Faculty       | SAM Global University                                   | Madhya Pradesh |
| 69 | Rajendra kumar patel           | Faculty       | infinity management and engineering college, Sagar      | Madhya Pradesh |
| 70 | Dr. Ashish Verma               | Faculty       | Dr. Harisingh Gour Vishwavidhalaya, Sagar               | Madhya Pradesh |
| 71 | JAHAR SINGH LODHI              | PG Student    | Medi-Caps University Indore                             | Madhya Pradesh |
| 72 | Dr. Neelesh Jain               | Faculty       | Trinity Institute of Technology and Research, Bhopal    | Madhya Pradesh |
| 73 | Pradeep Kumar Pandey           | Faculty       | SAM Global University                                   | Madhya Pradesh |
| 74 | Zahra Amin                     | UG Student    | International Institute of Information Technology, pune | Maharashtra    |
| 75 | Swapnil Uttam Shinde           | UG Student    | International Institute of Information Technology, pune | Maharashtra    |
| 76 | Mangesh Gaikwad                | UG Student    | International Institute of Information Technology, pune | Maharashtra    |
| 77 | ALEX VIRENDRA SAKHA            | UG Student    | International Institute of Information Technology, pune | Maharashtra    |
| 78 | Riddhi Apar                    | UG Student    | International Institute of Information Technology, pune | Maharashtra    |
| 79 | SHASTRI VISHWASHREE            | Faculty       | Malla Reddy College of Engineering for Women            | Telangana      |
| 80 | Dr. Mahesh Mudavath            | Faculty       | Jayamukhi Institute of Technological Sciences           | Telangana      |
| 81 | SHAIK SHOYAB                   | UG Student    | Malla Reddy Institute of Technology                     | Telangana      |
| 82 | Dr Abdul Ahad                  | Faculty       | Anurag University                                       | Telangana      |

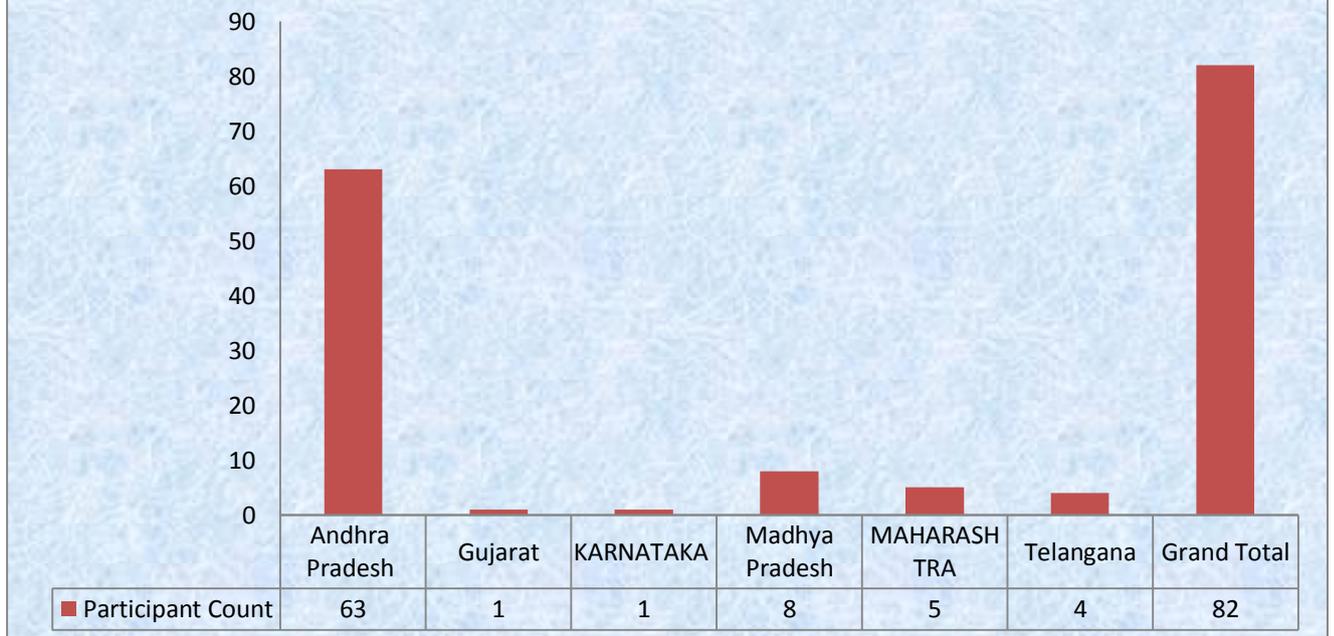
## E. Webinar Data Analysis



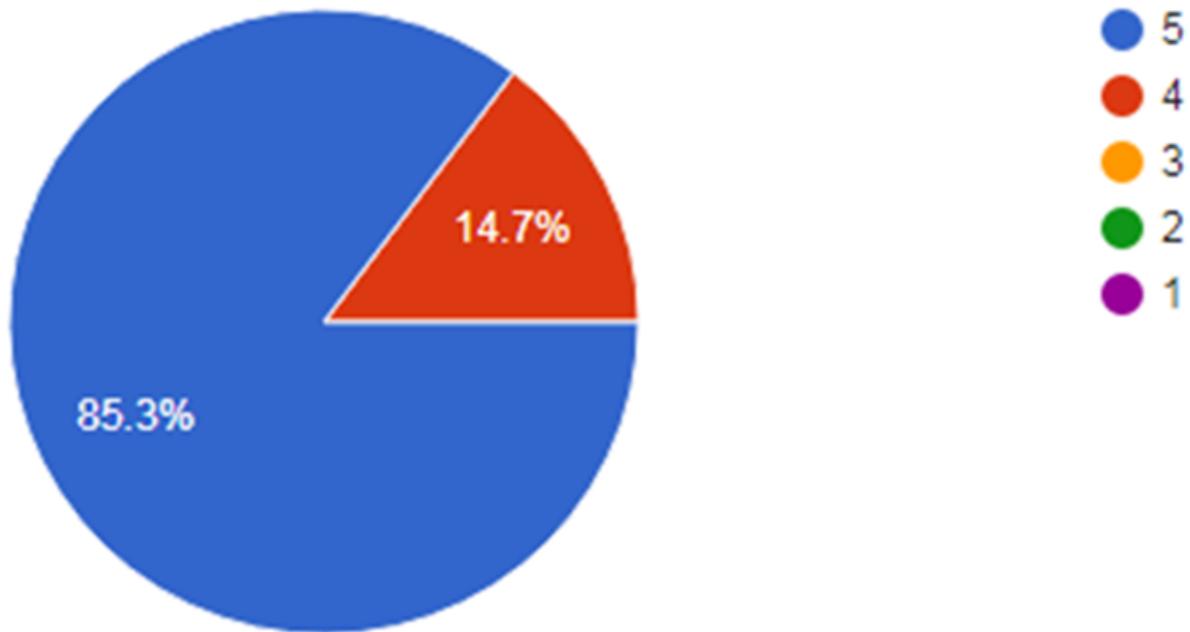
## Institute wise Participant Count



## State Wise Participant Count



## Participant Feedback on Webinar out of 5



## F. Photos

A screenshot of a Google Meet webinar interface. The main screen displays a presentation slide titled "Low Power VLSI Design Challenges - A View" by Dr. M. Kamaraju, Professor of E.C.E. & Director (AS&A) at Seshadri Rao Gudlavalluru Engineering College, Gudlavalluru. The slide also features "Key Points" and "KL University" logos. The meeting controls at the bottom show the time as 2:06 PM and the date as 16-03-2024. The participant list on the right includes Dr. M. Kamaraju, Dr. Srinivasa Rao K., Dr. Neelesh Jain, Rooban S, Dr. Srinivasa Rao K., MOHAMMAD, and DR. FAZAL NOORBASHA.

Guest Portal | Mail - Dr. Fazal Noorbasha - C | (4) WhatsApp | Meet - avs-yits-mnu | National Webinar Low Power |

meet.google.com/avs-yits-mnu

Dr.M Kamaraju (Presenting)

LOW POWER VLSI DESIGN

srgec

**NEED FOR LOW POWER**

Key points

Portable Devices

Dr. M. Kamaraju

Dr.M Kamaraju

Dr.Srinivasa Rao K.

R

DR. FAZAL NOORBASHA

People

+ Add people

Contributors

- DR. FAZAL NOOR... (You) Meeting host
- AKHIL KORMI
- Dr Suman Maloji
- Dr. Arun Kumar Singh
- Dr. Fazal Noorbasha
- Dr. Hari Kishore Kakarla
- Dr. Mvd Prasad

2:07 PM | avs-yits-mnu

14:07 16-03-2024

Dr.M Kamaraju (Presenting)

Dr.M Kamaraju (Presenting)

Rooban S

R

Dr.Srinivasa Rao K.

Dr. Neelesh Jain

MOHAMMAD

Dr.Srinivasa Rao K.

Dr.M Kamaraju (Presentation)

Dr.M Kamaraju joined

Dr.M Kamaraju (Presenting)

LOW POWER VLSI DESIGN

## LOW POWER STRATEGIES

- OS level: PARTITIONING, POWER DOWN
- Software level: REGULARITY, LOCALITY, CONCURRENCY  
(Compiler technology for low power, instruction scheduling)
- Architecture level: PIPELINING, REDUNDANCY, DATA ENCODING  
(ISA, architectural design, memory hierarchy, HW extensions, etc)
- Circuit/Logic level: LOGIC STYLES, TRANSISTOR SIZING, ENERGY RECOVERY-----  
(Logic families, conditional clocking, adiabatic circuits, asynchronous design)

Key points

Strategies

Dr.M.Kamaraju

Dr.M.Kamaraju

Dr.Srinivasa Rao K.

Venkat Ratnam

Rooban S

Dr.Srinivasa Rao K.

V Srinivasa Rao

DR. FAZAL NOORBASHA

Dr.M Kamaraju (Presenting)

LOW POWER VLSI DESIGN

## Balanced Delay Paths to Reduce Glitching

Glitching is due to a mismatch in the path lengths in the logic network: if all input signals of a gate change simultaneously, no glitching occurs

- Delay balanced
- No glitch
- Same function

Key points

Delay Paths

Dr.M.Kamaraju

Dr.M.Kamaraju

Dr.Srinivasa Rao K.

DR. FAZAL NOORBASHA

People

Add people

- BOLEM VAMSY KRISHNA
- Chaitanya Krishna
- Dr.Badugu suresh
- Dr.Fazal Noorbasha
- Dr.G.China Satyanaraya...
- Dr.Hari Kishore Kakarla
- Dr.M.Z.Rahman
- Dr.Nvk Ramesh

Dr.M Kamaraju (Presenting)

LOW POWER VLSI DESIGN

## Clock Power Reduction

Reduce clock frequency:

- Multiple frequency domains
- Dual edge triggered flip flops

$$\text{Clock power} = f * C * V^2$$

Key points

Dynamic Power

Dr.M.Kamaraju

Dr.M.Kamaraju

Dr.M.Z.Rahman

DR. FAZAL NOORBASHA

People

Add people

- Dr.P.S.Srinivas Babu
- Dr.Srinivasa Rao K.
- Dr.Srinivasa Rao K.
- enireddy vamsidhar
- Ghali venkata subbarao
- gnaneshwar chary
- K Girija Sravani
- Lakshmi Yamireddy

Dr.M Kamaraju (Presenting)

VLSI DESIGN STYLES

### IC Design Steps

```

    graph LR
      A[Specifications] --> B[High-level Description]
      B --> C[Functional Description]
      B --- D[Behavioral VHDL, C]
      C --- E[Structural VHDL]
  
```

Key points

Dr.M.Kamaraju

Dr.M Kamaraju

Dr. M.Z.Rahman

DR. FAZAL NOORBASHA

People

- Dr.K.Venkata Ratnam
- Dr. Fazal Noorbasha
- Dr. G. China Satyanaraya...
- Dr. Hari Kishore Kakarla
- Dr. Kumar N Ketavath
- Dr. M.Z.Rahman
- Dr. Mvd Prasad
- Dr. Nvk Ramesh

Dr.M Kamaraju (Presenting)

VLSI DESIGN STYLES

### FPGA Vs Standard Cell ASIC

| FPGA                         | Standard Cell ASIC                 |
|------------------------------|------------------------------------|
| Short Development Time       | Difficult to Design                |
| Easy to Design               | Long Development Time              |
| Low NRE Costs                | High NRE Costs                     |
| Design Size Limited          | Support Large Designs              |
| Design Complexity Limited    | Support Complex Designs            |
| Performance Limited          | High Performance                   |
| Power Consumption (moderate) | Low Power Consumption              |
| High Per-Unit Cost           | Low Per-Unit Cost (at high volume) |

Key points

FPGA, Standard Cell

Dr.M.Kamaraju

Dr.M Kamaraju

Dr. M.Z.Rahman

DR. FAZAL NOORBASHA

People

- DR. FAZAL NOOR... (You) Meeting host
- BOLEM VAMSY KRISHNA
- Chaitanya Krishna
- Dr. Aika
- Dr. Badugu suresh
- Dr. Fazal Noorbasha
- Dr. G. China Satyanaraya...
- Dr. Kumar N Ketavath

Dr.M Kamaraju (Presenting)

LOW POWER VLSI DESIGN

### Low Power VLSI Design :: Challenges-A Quick View

by Dr.M.Kamaraju  
Professor & Director (AS&A),

catch me at

profmkr@gmail.com

Thank you

HEROES  
Nurses  
Doctors  
COURAGE  
Dedication  
Healthcare Workers  
COMMITMENT  
Frontline  
Thank You  
Emergency Services  
BRAVERY  
PASSION  
Police  
Military  
Paramedics  
SPIRIT  
Fire Fighters

Dr.M Kamaraju

Dr.Srinivasa Rao K.

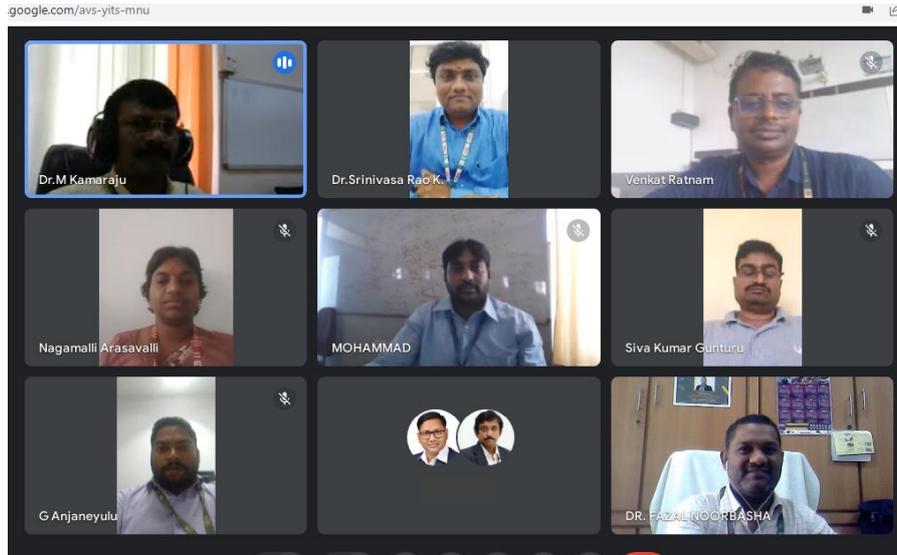
Venkat Ratnam

Rooban S

Dr.Srinivasa Rao K.

Nagamalli Arasavalli

DR. FAZAL NOORBASHA



### G. Participant Certificate



Thank you

With best Regards

**Dr. Fazal Noorbasha**

Convener

Associate Professor – ECE

Associate Dean – Academics

K L University, Green Fields,

Vaddeswaram, Tadepalli, Guntur, AP - India

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----- End of the Report -----