The Zenith

January 01, 2021

Volume 4, Issue 1

Why Electronics & Telecommunication Engineering?

Contents:

Stretchable micro-supercapacitors to self-power wearable devices

A stretchable system that can harvest energy from human breathing and motion for use in wearable health-monitoring devices may be possible, according to an international team of researchers, led by Huanyu "Larry" Cheng, Dorothy Quiggle Career Development Professor in Penn State's Department of Engineering Science and Mechanics.

The research team, with members from Penn State and Minjiang University and Nanjing University, both in China, recently published its results in Nano Energy.

According to Cheng, current versions of batteries and supercapacitors powering wearable and stretchable health-monitoring and diagnostic devices have many shortcomings, including low energy density and limited stretchability.

"This is something quite different than what we have worked on before, but it is a vital part of the equation," Cheng said, noting that his research group and collaborators tend to focus on developing the sensors in wearable devices. "While working on gas sensors and other wearable devices, we always need to combine these devices with a battery for powering. Using micro-supercapacitors gives us the ability to self-power the sensor without the need for a battery."

An alternative to batteries, micro-supercapacitors are energy storage devices that can complement or replace lithium-ion batteries in wearable devices. Micro-supercapacitors have a small footprint, high power density, and the ability to charge and discharge quickly. However, according to Cheng, when fabricated for wearable devices, conventional micro-supercapacitors have a "sandwich-like" stacked geometry that displays poor flexibility, long ion diffusion distances and a complex integration process when combined with wearable electronics.

This led Cheng and his team to explore alternative device architectures and integration processes to advance the use of micro-supercapacitors in wearable devices. They found that arranging micro-supercapacitor cells in a serpentine, island-bridge layout allows the configuration to stretch and bend at the bridges, while reducing deformation of the micro-supercapacitors -- the islands. When combined, the structure becomes what the researchers refer to as "micro-supercapacitors arrays."

"By using an island-bridge design when connecting cells, the micro-supercapacitor arrays displayed increased stretchability and allowed for adjustable voltage outputs," Cheng said. "This allows the system to be reversibly stretched up to 100%."

By using non-layered, ultrathin zinc-phosphorus nanosheets and 3D laser-induced graphene foam -- a highly porous, self-heating nanomaterial -- to construct the island-bridge design of the cells, Cheng and his team saw drastic improvements in electric conductivity and the number of absorbed

charged ions. This proved that these micro-supercapacitor arrays can charge and discharge efficiently and store the energy needed to power a wearable device.

The researchers also integrated the system with a triboelectric nanogenerator, an emerging technology that converts mechanical movement to electrical energy. This combination created a self-powered system.

"When we have this wireless charging module that's based on the triboelectric nanogenerator, we can harvest energy based on motion, such as bending your elbow or breathing and speaking," Cheng said. "We are able to use these everyday human motions to charge the micro-supercapacitors."

By combining this integrated system with a graphene-based strain sensor, the energy-storing micro-supercapacitor arrays -- charged by the triboelectric nanogenerators -- are able to power the sensor, Cheng said, showing the potential for this system to power wearable, stretchable devices.

www.sciencedaily.com

Flexible and powerful electronics

Researchers at the University of Tsukuba have created a new carbon-based electrical device, π-ion gel transistors (PIGTs), by using an ionic gel made of a conductive polymer. This work may lead to cheaper and more reliable flexible printable electronics.

Organic conductors, which are carbon-based polymers that can carry electrical currents, have the potential to radically change the way electronic devices are manufactured. These conductors have properties that can be tuned via chemical modification and may be easily printed as circuits. Compared with current silicon solar panels and transistors, systems based on organic conductors could be flexible and easier to install. However, their electrical conductivity can be drastically reduced if the conjugated polymer chains become disordered because of incorrect processing, which greatly limits their ability to compete with existing technologies.

Now, a team of researchers led by the University of Tsukuba have formulated a novel method for preserving the electrical properties of organic conductors by forming an "ion gel." In this case, the solvent around the poly(para-phenyleneethynylene) (PPE) chains was replaced with an ionic liquid, which then turned into a gel. Using confocal fluorescent microscopy and scanning electron microscopy, the researchers were able to verify the morphology of the organic conductor.

"We showed that the internal structure of our π-ion gel is a nanofiber network of PPE, which is very good at reliably conducting electricity" says author Professor Yohei Yamamoto.

In addition to acting as wires for delocalized electrons, the polymer chains direct the flow of mobile ions, which can help move charge-carriers to the carbon rings. This allows current to flow through the entire volume of the device. The resulting transistor can switch on and off in response to voltage changes in less than 20 microseconds -- which is faster than any previous device of this type.

"We plan to use this advance in supramolecular chemistry and organic electronics to design a whole arrange of flexible electronic devices," explains Professor Yamamoto. The fast response time and high conductivity open the way for flexible sensors that enjoy the ease of fabrication associated with organic conductors, without sacrificing speed or performance.

Source: University of Tsukuba

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Expert Lecture/Seminars/Courses/Industrial Visits Organized

- A panel discussion was organized on “Scope & Career Opportunities in Electronics & Telecommunication Engineering” on 6th November 2020.

- Webinar was conducted on “Changes in Gate exam and how to take advantage of it" by Mr. Kaja Naga Sai Hemanth, Mr. Gautham Ambati, Mr. Ijaz M Yousuf on 9th November 2020

- Webinar On “Operations Management” By Mr Saleel Raje , CEO & Director, ESDM technology Pvt. Ltd On 10th November 2020.

- A webinar was conducted on “Career Opportunities in Automation World” by Mr. Shirish Chaphekar, Director, Emerson Export Engineering Center, Nashik on 11th November 2020.

- Webinar was conducted on “Career Opportunities for Engineers as Class-1 Officers in the Armed Forces", by Brigadier Harish Chande (retd) on 3rd December 2020.

- Webinar on “2020 Nobel Prize in Physics: Blackholes are there” By Prof. Dr. Gireesh P. Pimpale, Ex. Associate Professor and Head, Department of physics, HPT Arts and RYK Science College, Nashik on 10th December 2020 under Astro club of K. K. Wagh Institute of Engineering Education & Research, Nashik.

Industrial Training / Seminar/Workshop done by Staff

- Mrs. R. V. Chothe has participated in FDP on “Outcome Based Education” from 4th November to 6th November 2020.

- Ms. J. R. Shinde has participated in STTP on “Academic Innovation in industry 4.0” organized by Vishwakarma Institute of Information Technology, Pune from 2nd November to 7th November 2020.


Bansilal Ramnath Agarwal Charitable Trust's
VISHWAKARMA INSTITUTE OF TECHNOLOGY, PUNE
Department of Electronics & Telecommunication
AICTE Sponsored Short Term Training Program on
Academic Innovations in Industry 4.0
2nd November 2020 – 7th November 2020
Certificate of Completion
This is to certify that Mr./Mrs./Ms. Jagruti R. Shinde
has successfully completed the Short Term Training Program on
"Academic Innovations in Industry 4.0",
organized during 2nd November 2020 to 7th November 2020 by Department of E&TC Engineering, Vishwakarma Institute of Technology, Pune and sponsored by AICTE.
Dr. Shripad Bhatlawande
Coordinator
Professor & Head E&TC Dept
Dr. Swati Shilaskar
Convener
Associate Professor & Dean
Dr. Rajesh Jalnekar
Director
Vishwakarma Institute of Technology

- AICTE, New Delhi has organized Online Student Induction Program (SIP) in two parts (SIP Part I – 8th to 13th November 2020 & SIP Part II – 16th to 20th November 2020) mainly for 1st year (newly admitted) students of 2020-21 batch and interested faculty members. From the Department of Electronics and Telecommunication of K. K. Wagh Institute of Engineering Education and Research, Nashik. Mrs. A. H. Dhangare and Mr. S. A. Zalte have attended the Online Student Induction Program in English Language.
- Mrs. R. V. Chothe has participated in Short-Term Training Program on “Role of Teacher: To Boost Moral values, Ethics in Engineering Education System” from 17th December to 23rd December 2020.


KBTCOE
Maratha Vidya Prasarak Samaj's
KARMAVEER ADV. BABURAO GANPATRAO THAKARE
COLLEGE OF ENGINEERING, NASHIK
Certificate
of participation
Rupali Vilas Chothe
of
KKWIEE&R
has participated in AICTE sponsored One week Online Short-Term Training Program on
"Role of Teacher: To Boost Moral values, Ethics in Engineering Education System"
Organized by Department of Electronics & Telecommunication Engineering,
MVPS's, KBT College of Engineering, Nashik
During 17th Dec. 2020 to 23rd Dec. 2020
Dr. V.M.Birari
HOD E&TC Engg.
Prof. N.B.Desale
Vice-Principal
Dr. N.S.Patil
Principal

Campus Placement

Sr. No.	Name of the Company	No. of students Placed
1.	TCS	11

Indian Constitution Day

On the occasion of Indian Constitution Day, all the faculty of E & TC Department reads the preamble of constitution on 26th November 2020.

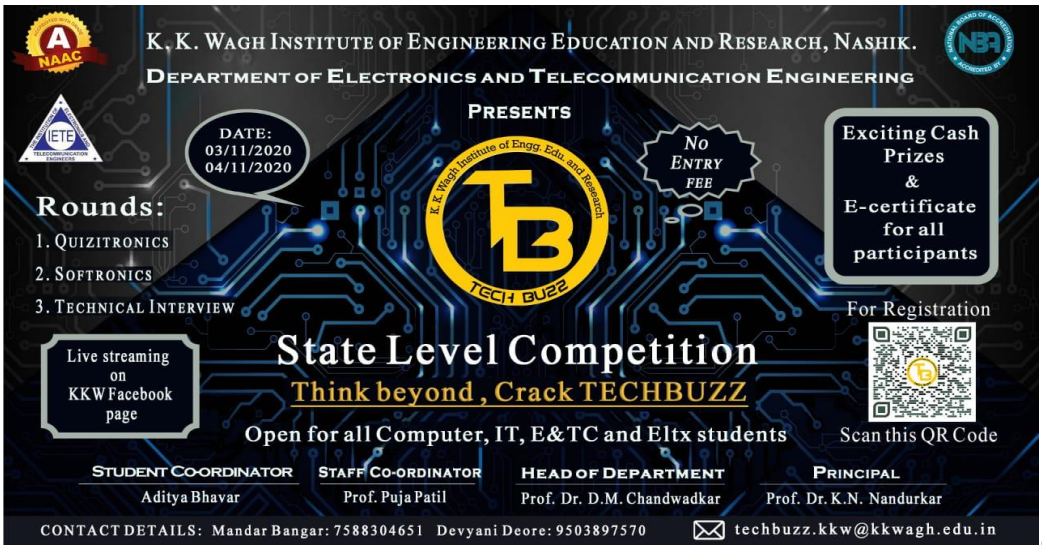
TECKBUZZ-2020

About Techbuzz

“In the middle of difficulty, lies opportunity”

It is obvious to feel overwhelmed and anxious about what is happening all around us. This pandemic has changed everything. Being stuck in this pandemic, students should be kept motivated. Technology is something that allows us to connect anytime, anywhere, and to anyone in this world.

Hence, making use of this technology we the students of Department, Electronics and Telecommunication of K.K. Wagh Institute of Engineering Education and Research, Nashik had planned to organize state Level Online Technical event TechBuzz-2020 in collaboration with I.E.T.E, Nashik Sub center event online to prepare them to compete in the future competitive world and not compromising on our student’s future. Students from all over Maharashtra have come forward and participated in this event. We got overwhelming 250+ responses from students participating from all over state.



This is the complete package for the students to test themselves in all the aspects of technical field. Also to sharpen their skills, and forced them to think out of box.

Sitting at home students were able to experience one on one interview, the interviewer were expertise in their respective fields

The event was held online on 3rd and 4th November 2020 with an aim of awakening student's imagination and resonating their skills with us. The competitions were Circuit building ,coding and quiz competition for 12th students.

We hoped for getting maximum participation from the student's side and it certainly did. We feel so glad to say that from the safety of the house students could participate and share their work with us.

There were no entry fees for participation. The students eligible to participate were Junior college students (11th and 12th Standard), Diploma students, and UG Engineering Students. All the participants have received a participation certificate and a Cash Prize worth Rs. 5,000/- was given to the winners.

Pillars of Strength for TechBuzz:

Patron: Hon. Shri. Balasaheb D. Wagh (President, K.K. Wagh Education Society, Nashik)

Program Chair: Prof. Dr. K. N. Nandurkar (Principal, K.W.I.E.E.R, Nashik)

Convener:

Prof. Dr. D. M. Chandwadkar (Head, Department of Electronics and Telecommunications, K.W.I.E.E.R, Nashik)

Prof. Dr. S. A. Patil (Ugale) (U.G. Coordinator, Department of Electronics and Telecommunications, K.W.I.E.E.R, Nashik)

Staff Co-Ordinators: Mrs. Puja . P .Patil

Technical and Organizing Team:

1. Aditya Bhavar(TE Eltx)
2. Mandar Bangar(TE Eltx)
3. Sanjana kalantari(TE Eltx)
4. Deyvani Deore(TE Eltx)

Competition wise Entry:

Sr. No.	Competition	Total Participants
1.	Circuit Building	259
2.	Engineering foundation Quiz	28
	Total Participant's	287

Summary of Participants:

Total Participant's: 287

Participant's from Junior Colleges: 28

Participant's from Diploma Colleges: 31

Participants from UG Engineering College: 228

1. **Participants from K.K.W.I.E.E.R:** 121
2. **Participants from Other Engineering Colleges:**166

ABOUT INAUGURAL CEREMONY

Date: 3rd November 2020 Time: 10:15am to 11.30 pm Total Participants: 190

The inauguration ceremony started with a warm introduction about Techbuzz-2020 and later on welcoming the Eminent Chief Guest of Honour Prof. Dr. D. S. Bormane, Chairman, BOS(E&TC), Principal, AISSMS, Pune , Mr. Chetan Deokar ,Project Mnager ,R&D,SIEMENS, Banglore, Prof. Dr. K. N. Nandurkar ,Principal of K.K. W.I.E.E.R, Nashik, Prof. Dr. D. M. Chandwadkar Head of Department of Electronics and Telecommunication Department and U. G. Coordinator of the department Dr. S. A. Patil (Ugale). Later on, the Inauguration Ceremony started with curtains opening with the sound of Nashik Dhol to give a maximum visual and energetic impact to all the audience present. Next, there was a speech by Prof. Dr. D. M. Chandwadkar followed by a speech by Prof. Dr. K. N. Nandurkar, Prof. Dr. D. S. Bormane Sir and Mr. Chetan Deokar Sir also guided our students with their wisdom and precious knowledge. Students from all over India attended the Ceremony in large numbers and appreciated both the Guest's kind gesture to honor all of them with their gracious presence. At last, the inauguration ended with a Vote of thanks by P.P. Patil..

DAY-1 COMPETITIONS

1. **Quiz competition for UG and Diploma**

Quizzes were held on google forms platform were 228 participants were of UG and 31 were of diploma. The questions in the quiz were based on mathematics, general aptitude, electronics and coding. There were 30 questions. 40 students were shortlisted for round 2 on the basis of merit list.

2. **Circuit building / coding**

The shortlisted participants were given the choice between hardware and software, according to their preference they appeared for round 2. The circuit building competition was held on google forms platform there 3 question were given to participants on problem solving. The coding competition was conducted on hacker rank platform. Here also 3 questions were given to the participants.

3. **Engineering Foundation Quiz**

A Foundation quiz competition was also held on Google quiz Participants from all over state had participated in this competition. This quiz is of 50 marks was based on physics ,chemistry and Maths .There was a total of 28 participants entry. Then the Winner and Runner -Up for the competition were selected. The Winner and Runner-Up of the Competition were

Rank	Name
1	Ms . Jagruti Suresh Patil
2	Ms Sanskriti Vijayprakash Sharma
3	Mr. Shreyas Sanjay Dashpute

DAY-2 COMPETITIONS

Personal Interview:

Overall 12 participants were selected for 3rd round i.e. personal interview among which 6 participants were of software and the other 6 were of hardware category.

The participants under software category were judged by Mr. Ojas Patil and Mr. Amit Naik. On the basis of their technical (based on round 2 questions), analytical, behavioral, skills.

Top Three Winners in Software Category:-

Rank	Name	Institute Name
1	Ajinkya Badhan	Sandip Institute, Nashik
2	Harshada Kadus	Cummins College, Pune

3	Sakshi Kulkarni	K. K. W. I. E. E. R. Nashik

The participants under hardware category were judged by Mr. Mohan Dhotare on the basis of their technical (based on round 2 questions), analytical, behavioral, skills.

Top Three Winners in Hardware Category:-

Rank	Name	Institute Name
1	Rigveda Koranne	Sandip Institute, Nashik
2	Ankush Darade	Cummins College, Pune
3	Pankaj Darade	K. K. W. I. E. E. R. Nashik

Alumni Meet 2020-21

Date: 21st December 2020

Time: 1:30 pm

Duration: 1 hour

Number of attendees: 52

Attendees:

- Alumni
- All staff members of E & TC department
- Few Students of B.E E&TC and Electronics

SUMMARY:

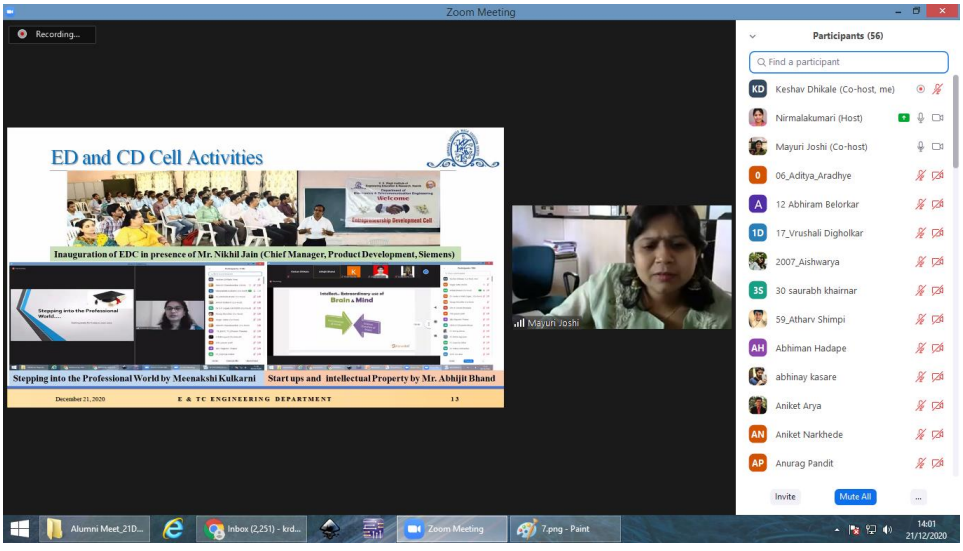
An Online Alumni Meet of E & TC department, K. K. Wagh Institute of Engineering Education & Research, Nashik was organized on 21st December 2020 at 1:30 PM. Meeting started with a Warm Welcome by Alumni Coordinators and then Departmental Video followed by Departmental presentation.

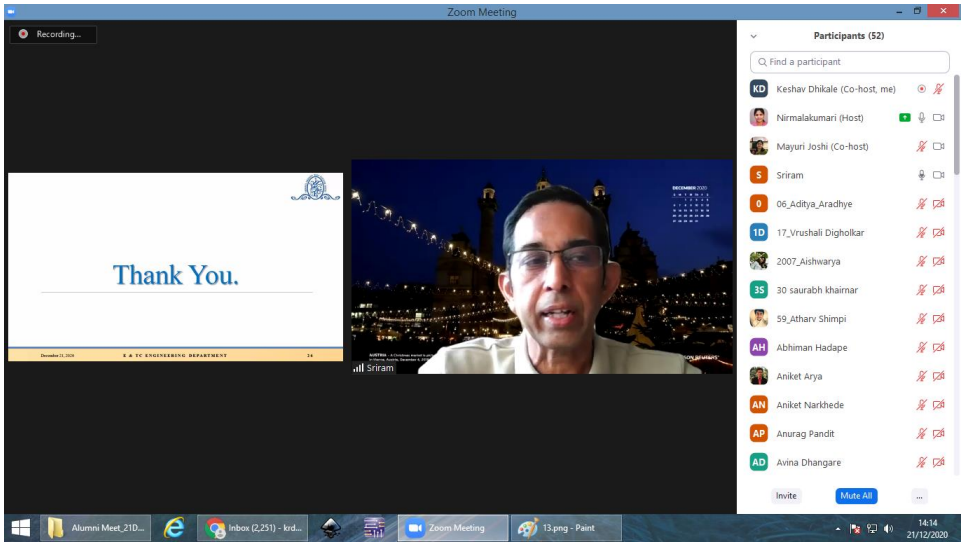
Some of the things which Alumni has shared/interacted are:

1. Mahesh Vibhute(2005 passout) suggested to conduct some sort of online meets to be arranged to ensure that connection will be there with one another.
2. Shriram Krishnan(1992 passout) expressed his old memories when he was a student. He said that he want to be in touch in any form with staff and college. He said An alumni is important part for college to grow. Lot of work can be done alumni together with college, it is a mutually beneficial thing he said. Lot of people are in positions of power where they could have enough influence within their organizations where they can use it for the benefit of students/college like from the presentation he focused on internships to be offered to students by alumni. He also spoke about Bangalore chapter.

   Chetan Deokar, Anurag Pandit, Aniket Narkhede, Smital Dhake, Amit trivedi answered to the queries raised by current students

   Finally cultural activity (song sung by Tushar Agasti) and Vote of thanks

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Nirmalakumari (Host)
Mayuri Joshi (Co-host)
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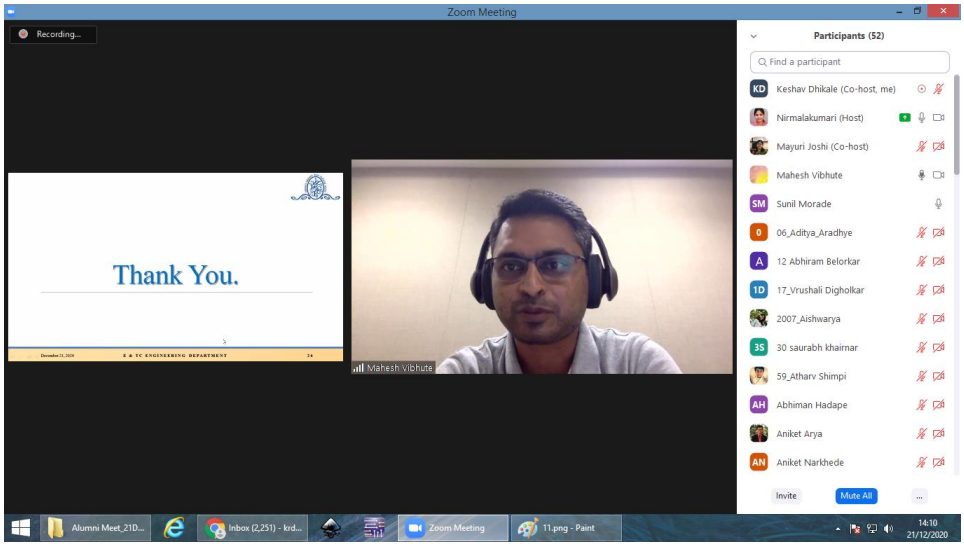
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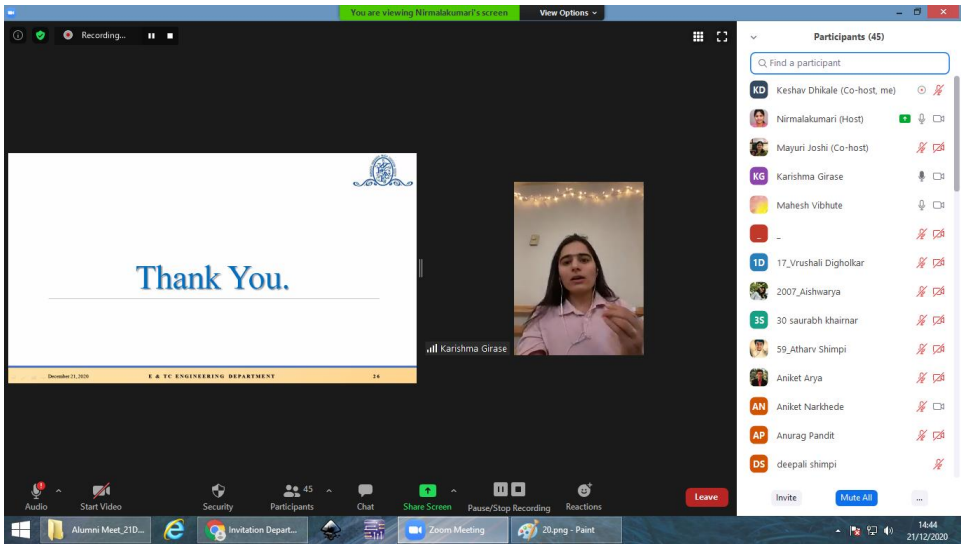
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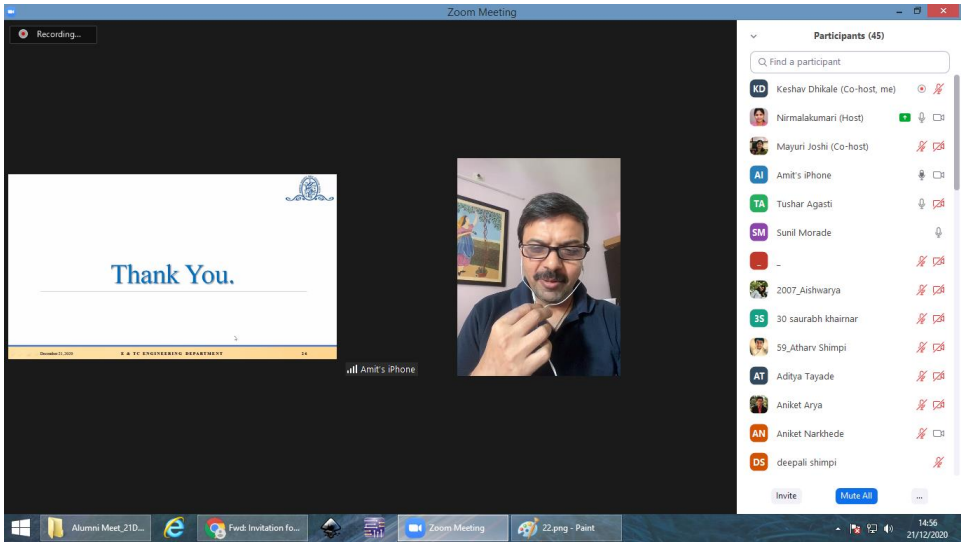
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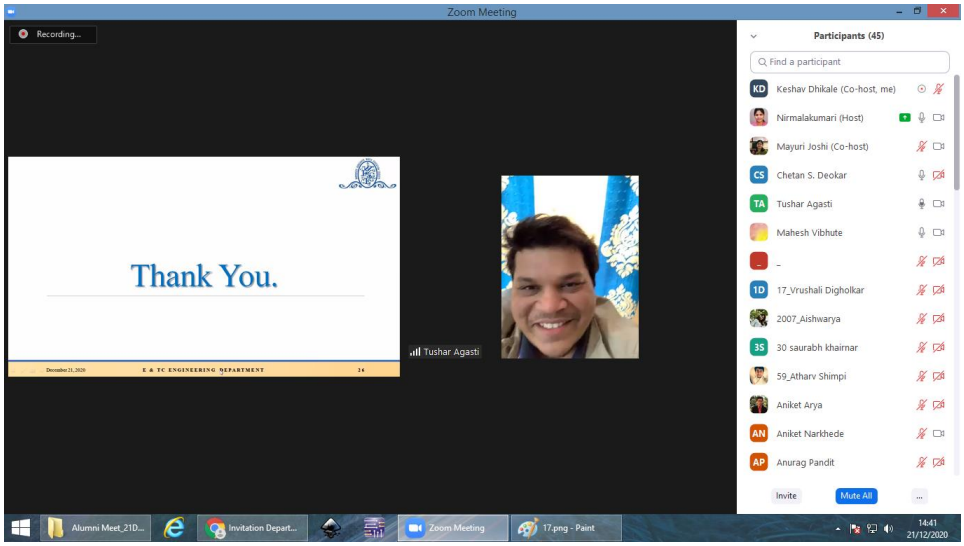
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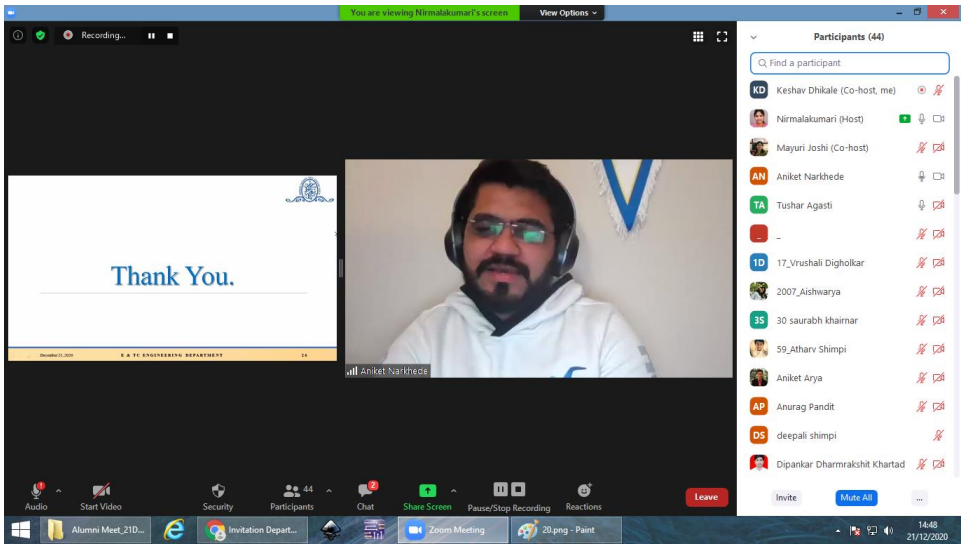
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Vision

Provide quality education to create engineering professionals of global standards by keeping pace with rapidly changing technologies to serve the society.

Mission

M1: To educate the students with the state-of-the-art technologies and value based education to meet the growing challenges of industry.

M2: To provide scholarly ambience & environment for creating competent professionals.

M3: To inculcate awareness towards societal needs.