

# Instrumentation Engineering

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Newsletter 2022-2023



## **Vision statement of Department**

To be recognized as leading contributor in imparting technical education and research in Instrumentation & Control engineering for development of the society.

## **Mission statement of Department**

- 1.To deliver knowledge of Instrumentation and Control Engineering by strengthening involvement of Research institutions and industries in academics
2. To build conducive environment for advanced learning through participation of faculty and students in collaborative research, consultancy projects, student exchange programs and internships
- 3.To develop competent Engineers with entrepreneurial skills to address socio-economic needs.

## **Program Educational Objectives (PEO)**

The Graduates would demonstrate

1. Core competency in Instrumentation and Control Engineering to cater to the industry and research needs.
2. Multi-disciplinary skills, team spirit and leadership qualities with professional ethics, to excel in professional career and/or higher studies.
3. Preparedness to learn and apply contemporary technologies for addressing impending challenges for the benefit of organization/society.
4. Knowledge of recommended standards and practices to design and implement automation solutions.

## **PEO – Mission Mapping**

	M1	M2	M3
PEO1	3	2	2

PEO2	2	3	2
PEO3	2	3	3
PEO4	2	3	3

### **Program Specific Outcomes (PSOs)**

Graduates shall have the ability to:

- 1.Evaluate the performance of suitable sensors / Process components/ Electronic / Electrical components for building complete automation system.
2. Analyze real-world engineering problems in the area of Instrumentation and Control.
- 3.Design or Develop measurement / electronic / embedded and control system with computational algorithms to provide practical solutions to multidisciplinary engineering problems.

### **Program Outcomes**

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research –based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## Department Activities

### 1. Research Projects and Consultancy

Sr .No	Achievements	Name of Faculty
1	Ongoing Consultancy project	1. Prof. Dr. Shilpa Sondkar  2. Prof. Dr. Jayant Kulkarni and Dr. Sanika Patankar
3.	Ongoing Funded Research Projects	Prof. Dr. Jayant Kulkarni
4.	Ongoing Research Projects	Dr. Manisha Mhetre
5.	Applied Research Projects	1. Prof. Jitendra Gaikwad, Prof. Vijaykumar Bhanuse and Prof. Dr. Jayant Kulkarni applied to Rajiv Gandhi Science and Technology Commission in July 2022

### Faculty Publications in SCI, Scopus and UGC Care listed/ referred Journals

Journal	Number of Papers
SCI	4
Scopus/WOS	3
UGC/ Other	20
<b>Total</b>	<b>27</b>

### Faculty Publications with details

Sr. No	Title of paper	Name of the author/s	Name of journal	Year of publication	ISSN number	SCI/Scopus/ UGC Care
1.	Determination of Some Elastic Constants of Materials Using Impact Analysis	Vijaykumar Bhanuse	Journal of Vibration Engineering	2022-23	2523-3939	SCI/Scopus
2.	Electric components testing and analysis	Vijaykumar Bhanuse	GIS SCIENCE JOURNAL	2022-23	1869-9391	UGC care
3.	Reconstruction of an Image Based on 13/19 Triplet Half-Band Wavelet Filter Bank and Orthogonal Matching Pursuit	Pramod Kanjalkar	International Journal on Recent and Innovation Trends in Computing and Communication	2022-23	2321-8169	Scopus Sources 2021
4.	Age and Gender Detection	Pramod Kanjalkar	International Journal of Innovative Science and Research Technology	2022-23	2456-2165	Google Scholar
5.	Predictive Analysis of Adverse Drug effects using Machine Learning	Shilpa Sondkar	International Journal for Research in Applied Science and Engineering Technology	2022-23	2321-9653	Scopus Sources October 2022
6.	Triboelectric Nanogenerator-Based Vibration Energy Harvester Using Bio-Inspired Microparticles and Mechanical Motion Amplification	Manisha Mhetre	MDPI, Energies	2022-23		Scopus
7.	Music Genre Classifier	Manisha Mhetre	High Technology Letters	2022-23	1006-6748	UGC Care

8.	The Fitness Guide	Manisha Mhetre	Gis science journal	2022-23	1869-9391	Web of Science, UGC care
9.	MRI Image-Based Automatic Segmentation and Classification of Brain Tumor and Swelling Using Novel Methodologies	Kapil Mundada	International Journal of Image and Graphics	2022-23	0219-4678	Cross Ref
10	SMART FLOOR CLEANER	Vijaykumar Bhanuse	Journal of Emerging Technologies and Innovative Research	2022-23	2349-5162	UGC Care
11	Comparison of Signal Processing Methods for Bearing Fault Detection	Jitendra Gaikwad	International Journal for Research in Applied Science	2022-23	2321-9653	UGC Care
12	Automated Doors And Windows Using Voice Command	Jitendra Gaikwad	NOVYI MIR Research Journal	2022-23	0130-7673	UGC Care
13	Vision Based Pothole Detection And Mapping System	Jitendra Gaikwad	NOVYI MIR Research Journal	2022-23	0130-7673	UGC Care
14	Ingenious EV Charging Station with Green On-Grid Electricity and Wireless Charging	Jitendra Gaikwad	NOVYI MIR Research Journal	2022-23	0130-7673	UGC Care
15	Water Cooling System of PV Panel	Jitendra Gaikwad	NOVYI MIR Research Journal	2022-23	0130-7673	UGC Care
16	Design and Development of Underground Cable Fault Detection and Alerting System using GSM and GSM Module	Jitendra Gaikwad	International Journal of Scientific Research in Engineering And Management	2022-23	2582-3930	UGC
17	IntelliStick	Archana Chaudhari	International Journal of Creative Research Thoughts	2022-23	2320-2882	UGC
18	Development of Automated Trash Collecting Boat using Machine Learning	Anil Kadu	International Research Journal of Engineering and Technology	2022-23	2395-0072	UGC

19	Design and Development of Three Factor Authentication System for Smart Lock	Anil Kadu	GIS SCIENCE JOURNAL	2022-23	1869-9391	UGC Care
20	Crowdfunding Donation System Using Smart Contract and Ethereum	Pramod Kanjalkar	NOVYI MIR RESEARCH JOURNAL	2022-23	0130-7673	UGC Care
21	Vehicle number plate detection	Archana Chaudhari	NOVYI MIR Research Journal	2022-23	0130-7673	UGC Care
22	Material Characterization Based on a Comparative Analysis of Various Metals Elongations	Manisha Mhetre	IJRASET	2022-23	2321-9653	Google Scholar
23	Cleanzo: Vacuum Cleaner with Obstacle Detection using Bluetooth	Manisha Mhetre	IJRASET	2022-23	2321-9653	Google Scholar
24	Vision Application for Visually Impaired People	Manisha Mhetre	IJRASET	2022-23	2321-9653	UGC Care
25	A High Efficiency Modified Forward Converter for Solar Photovoltaic Applications	Praveen Pol	Electronic Power components and Systems Taylor and Francis	2022-2023	1532-5008	SCI
26	Dr. Vedant Shukla	Noise estimation in 2D MRI using DWT coefficients and optimized neural network	Biomedical Signal Processing and Control, Vol-71	2022-23	1746-8094	SCI
27	Dr. Vedant Shukla	Estimation of Nonhomogeneous Noise in 2D Magnetic Resonance Imaging	International Journal of Imaging Systems and Technology, 32 (4), 1357-1372	2022-23	1098-1098	SCI

### Faculty Patents

#### Patents Filed/Published and Granted Summary

Patents Granted	1
Patents Filed and Published	9
Total	10

<b>Sr. No</b>	<b>Name of Faculty</b>	<b>Title of Patent</b>	<b>Application No</b>	<b>Publication date</b>	<b>Patent No</b>
1.	Archana Chaudhari	System for Congestion control using congestion location indicator and supporting data collector nodes in WSN's using ML	2022/12899	28 <sup>th</sup> Feb 2023	Granted
2.	Manisha Mhetre and Shilpa Sondkar	Smart Tap Water System	2023/03208	28 <sup>th</sup> Feb 2023	Published
3.	Manisha Mhetre and Shilpa Sondkar	Non –invasive Hemoglobin level screening and indication system	2023/03196	28 <sup>th</sup> Feb 2023	Published
4.	Manisha Mhetre and Shilpa Sondkar	Advanced Digital board using Virtual pen	2023/03285	28 <sup>th</sup> Feb 2023	Published
5.	Manisha Mhetre	A portable device to convert text language to Braille language and vice versa	202221042161	30 <sup>th</sup> Nov 2022	Published
6.	Pramod Kanjalkar and Dr. Praveen Pol	A solar and Grid power hybrid water pumping system	202321029662	25 <sup>th</sup> April 2023	Published
7.	Archana Chaudhari and Shilpa Sondkar	A system for vegetable and fruits ripeness detection by color W-TF	2023/03293	28 <sup>th</sup> Feb 2023	Published



8.	Pramod Kanjalkar	An Artificial intelligence Real Time Wearable Audio Visual System for Sign Language Interpretation	202321026374	9 <sup>th</sup> April 2023	Filed
9.	Pramod Kanjalkar and Jitendra Gaikwad	An early Fire detection system with audio visual alarm	202321029531	23 <sup>rd</sup> April 2023	Filed
10.	Pramod Kanjalkar	A portable automatic extinguishing and collection system for highly polluting LIT cigarette Butts	202321030183	24 <sup>th</sup> April 2023	Filed

## 2. Interaction of Department Faculty with Department mentor Prof. Dr. Ramkrishna Pasumarthy, IIT Chennai

Prof. Dr. Ramkrishna Pasumarthy, IIT Chennai visited the department during International Conference on Industry 4.0 Technology 2022 from 22<sup>nd</sup> to 24<sup>th</sup> Sept 2022. He interacted with the department faculty on 22<sup>nd</sup> Sept 2022.



## 3. Professional Body Activities

## A. IEEE IMS VIT Pune Chapter activities

### 1. IEEE IMS Pune Chapter's National Level Project Competition on 3<sup>rd</sup> June 2022

**IEEE IMS Pune Chapter** and the team successfully organized its first-ever national event conducted in an online mode. The event was organized by **IEEE IMS Student Chapter** Vishwakarma Institute of Technology, Pune in association with the **IEEE Pune section of IEEE IMS Pune chapter of the department of instrumentation engineering**. The event was all about a National Level Project Competition. Students from various parts of the country participated in the competition.

The domains for the project competition were as follows

- Sensor and sensor design
- Industry 4.0
- Smart Cities/Agriculture/Energy/Healthcare
- Embedded Systems and Measurements, HMI/Industry Protocols
- Artificial Intelligence and the Internet of Things

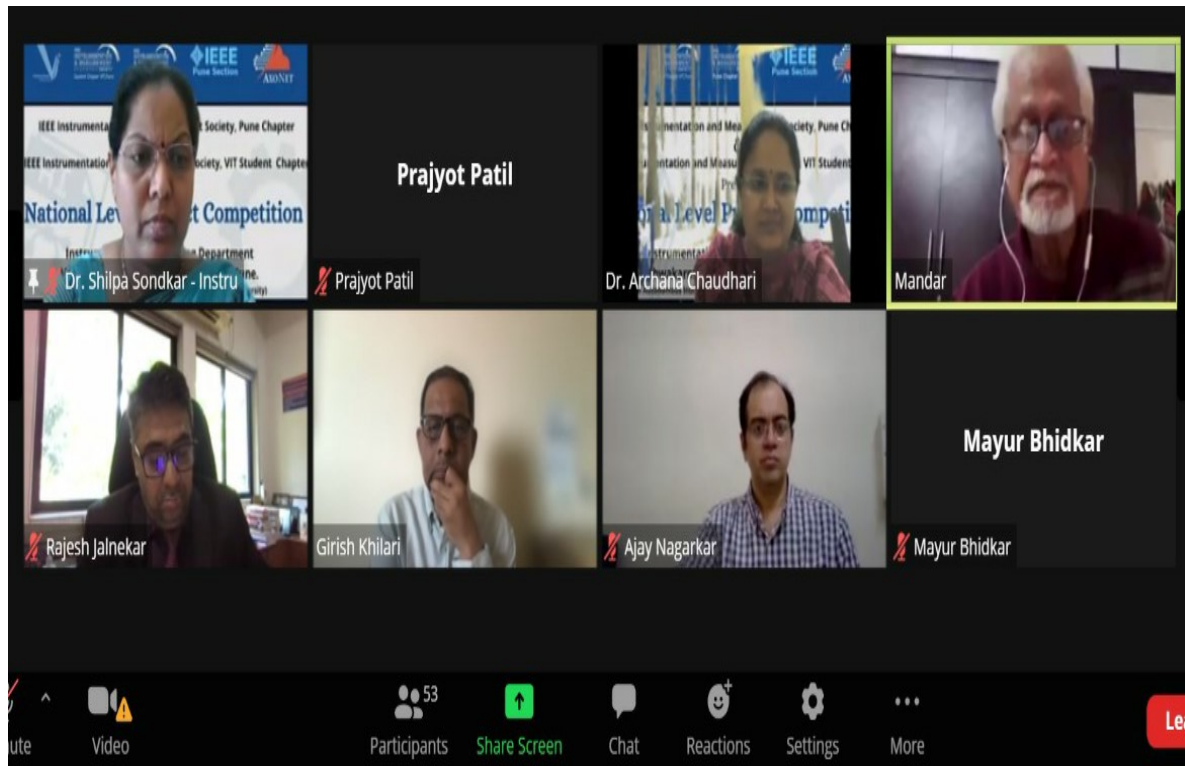
The total of **82** teams had registered for the competition among which **25** teams made it to the second phase and **13** groups made it to the final phase. The whole event was conducted in 3 phases. Students had to register their group to enter the competition. The first phase which was open till 10th May 2022, included the submission of the idea followed by a presentation. Various problem statements were brought by the students and their vision was to find a solution to the real-life problem faced by people. In the second phase which was held between 12th May 2022 to 20th May, 2022 students had to submit their idea in the form of a video. Students came up with a prototype of the projects. Phase 3 was the final round which was conducted on 3rd June 2022. The 3rd round was conducted online through google meet. Students demonstrated their hardware projects in front of the judges and the jury members.

Three teams were declared winner, runner up and second runner up. Prizes worth **Rs.35000/- along with IEEE memberships was awarded to the winner**. The participants were awarded a certificate of participation. Following are the details of the winners

Sr. no	Name of Student	Prize	Name of Institute
1	Luvai Darwajawala	Winner	K J Sommaiya College, Mumbai
2	Pavan Bhadane	First runner up	Vishwakaram Institute of Technology Pune
3	Sukhpreet Bhatti		
4	Maruti Patil		
5	Siddhant Pawar		
6	Ruchita Chaudhari		

7	G Arun Prabhakar	Second runner up	Francis Xavier Engineering College, Tamilnadu
8	R. Issac John Brighton		
9	S. Aishwarya		
10	P. Harries Pandi		
11	V J Venkatesh Babu		

Few snapshots of the event



**IEEE INSTRUMENTATION & MEASUREMENT SOCIETY®**  
Student Chapter VIT, Pune

**IEEE INSTRUMENTATION & MEASUREMENT SOCIETY®**  
Pune Chapter

**IEEE Pune Section**

## National Level Project Competition

**PHASE - 1**  
IDEA & PPT SUBMISSION  
Upto 05/ 05/22

**PHASE - 2**  
PROJECT VIDEO SUBMISSION  
10/05/22 to 15/05/22

**PHASE - 3**  
GRAND FINALE  
On 03/06/22

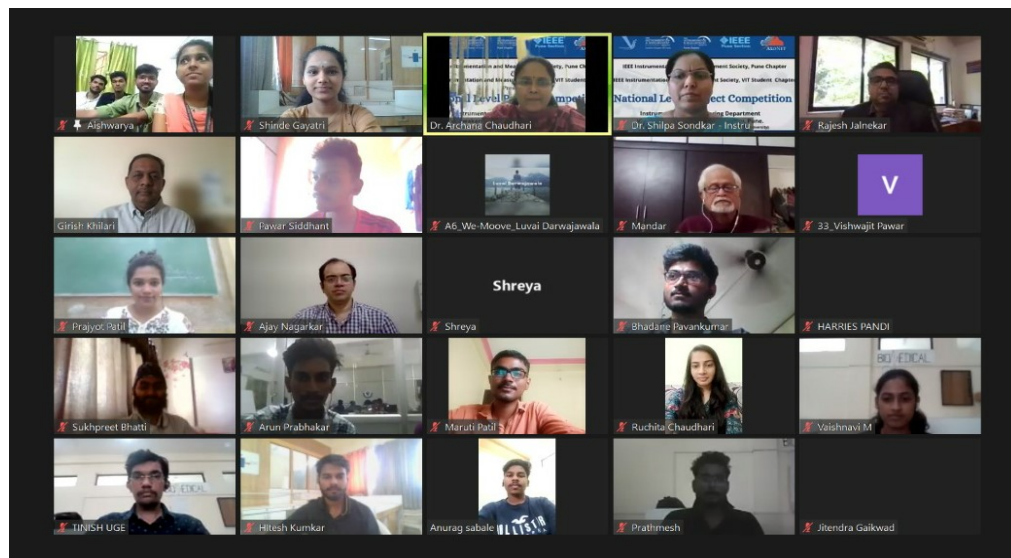
**ENTRY FEES:**  
Rs. 200/- Per group

**Prizes:**  
Rs. 50,000, Cer tificates and Much More

**CONTACT US :**  
Samarth Tiwatane : 9284639312  
Pushkar Choudhari : 9359815300

Registration (Rs .200/-per group) is mandatory for all the shortlisted students for Phase 2

[ieee.ims@vit.edu](mailto:ieee.ims@vit.edu) [ieee\\_ims\\_student\\_chapter\\_vitp](https://www.instagram.com/ieee_ims_student_chapter_vitp/) [IEEE IMS Project Competition](#)



We would like to mention our heartfelt thanks to the director of Vishwakarma Institute of Technology, **Dr. Rajesh Jalnekar** sir for providing us with this opportunity to conduct this event. We would like to thank the chairman of the IEEE IMS Pune chapter, **Prof. Mandar Khurjekar** sir, and **Girish Khilare** sir, chairman Of the IEEE Pune section for their helping hands. This wouldn't have been possible without the support of **Dr. Shilpa Sondkar** madam (HOD of Instrumentation and Control department & secretary of IMS Pune Chapter). Special

thanks to our faculty guide, **Archana Chaudhari** madam, whose guidance has helped us during this event.

Thank you so much **Ajay Nagarkar**, ACCONET for sponsoring our event. Last but not least we would like to thank the entire team of IEEE IMS Student Chapter VIT Pune for executing the whole event successfully. A total of **50** people were present in the event out of which **13** were IEEE IMS student members, three IEEE Faculty members and remaining non IEEE members.

## **2. Interaction of Prof. Dr. Daniel Watzeing, Graz University, Austria and Prof. Dr. RamkrishnaPasumathy with IEEE IMS student members of the Department on 22<sup>nd</sup> Sept 2022**

Prof. Dr. Daniel Watzeing visited and interacted with the IEEE IMS VIT Students chapter members. The students discussed the research and internship opportunities with him. The students also presented the activities conducted in the department from Jan 2022 .

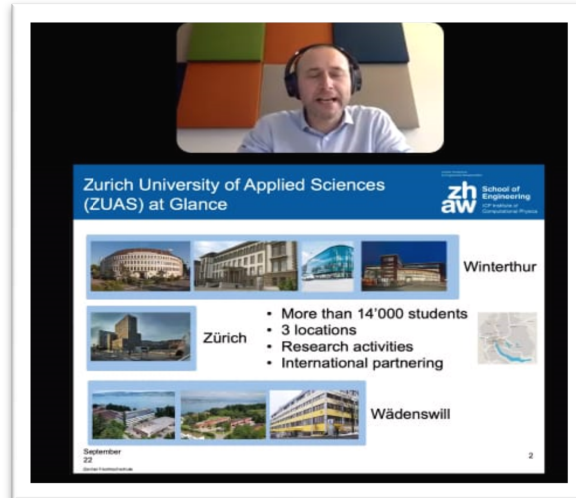


Interaction of IEEE IMS VIT students chapter with Prof. Dr. Daniel Watzeing along with Prof. Mandar Khurjekar, IEEE IMS Pune Chapter Chairman and Prof. Dr. Shilpa Sondkar Head of Department

## **3. Interaction of Prof. Dr. Mathias Bonmarin, Zurich University of Applied Science, with IEEE IMS student members of the Department on 24<sup>th</sup> Sept 2022**

Prof. Dr. Mathias Bonmarin, interacted with IEEE IMS VIT student members via online meeting on 24<sup>th</sup> Sept 2022. The students presented the activities conducted in the department under IEEE IMS student chapter. The students also asked him about the research and internship opportunities as Zurich.





Interaction of IEEE IMS VIT student members with Prof. Dr. Mathias Bonmarin

#### 4. Industrial Visit to IUCAA on 28<sup>th</sup> Feb 2023

IEEE IMS Student Chapter VIT Pune conducted its very first industrial visit on the 28th of February 2023 to The Inter-University Centre for Astronomy and Astrophysics (IUCAA) and National Centre for Cell Science (NCCS). The industrial visit was attended by the core committee members and the coordinators of IEEE IMS.



#### Introduction

Inter University Centre For Astronomy and Astrophysics (IUCAA), Pune was set up in 1988. At IUCAA, all the students were first briefed about the importance of IUCAA and the role it plays to help initiate and nurture, research and developmental activities in Astronomy and Astrophysics in the University sector. A small presentation was set up in the “Pulasta” auditorium for all the students attending the visit. A video called the “The space voyage” was shown and all the information in it was discussed by the Faculty at IUCAA. A Q&A session

was also arranged for those who were interested in clarifying their doubts regarding astronomy.

After an enriching and wonderful experience at IUCAA, the IEEE IMS team members headed to the National Centre for Cell Science (NCCS) which is a National Level, Biotechnology, Tissue Engineering and Tissue Banking research center located on the campus of University of Pune. The staff at NCCS welcomed all the students and briefed everyone about NCCS and the work that is carried out. After the brief, everyone was taken to the “Gargi” auditorium where a small video discussing about the previous work of NCCS and the facilities they have at their centre. The faculty then guided the members to the Fluorescence Activated Cell Sorters (FACS) lab where equipments named FACS Canto II, FACS Aria II SORP, FACS Aria III SORP, FACS Aria III STD were set up.

### Glimpses of the Industrial Visit



The Industrial visit to IUCAA and NCCS was an excellent and rewarding experience. A total numbers of members present were 22 out of which IEEE IMS members were 16 and non-IEEE IMS members were 6. It was an amazing experience to witness the knowledge about vastness of the space at IUCAA to the tiniest organisms in the cell at NCCS. All the members of IEEE IMS Student Chapter VIT Pune extend their gratitude towards Prof. M Khurjekar sir, Prof. Dr. Shilpa Sondkar ma'am and Prof. Sanika Patankar ma'am for organizing the visit.

### **5. Industrial Visit to Shree Pandurang Sahakari Sakhar,Shreepur**

An industrial visit of student members of IEEE IMS chapter was arranged on 1<sup>st</sup> March 2023 to Shree Pandurang Sahakari Sakhar Sugar Factory in Shreepur. Total of 25 student members attended the visit. Prof. Dr. Sanika Patankar accompanied the students for the industrial visit. The visit provided exposure to state of are process instrumentation loops, DCS, PLCs, valves, SCADA etc.

The Factory has significant presence in India for sugar and ethanol production along with sustenance in terms of power generation. The factory has crushing capacity of 7500 tonnes crushed per day. The plant is equipped with Siemens PLCs and Honeywell DCS systems. Plant consisted of five Mill tandem with Electric Drive ACVFD and controlled through DCS, Boiling House DCH to clear Juice, Horizontal tube type Continuous Pan,45 KLPD Distillery plant, which is PLC Controlled Multiprocessor distillation.

The plant manufactures Rectified Spirit, ENA and Ethanol. They are the first and only Co-operative Sugar factory availed CDM benefit. The Factory Generates power from bagasse (a sugar cane by product) for captive consumption and sale to the state grid in Maharashtra. Total Cogeneration capacity is 19MW with exportable surplus of 12 MW. Out of 19 MW, 9MW is of DEC and 10MW is of BP type. 09MW STG set was installed in the year 2005 and commissioned in 2006 and it was first DEC turbine in Maharashtra.

The students were given a brief introduction to the history and operations of the factory. They were then taken on a guided tour of the factory, where they saw the different stages of the sugar manufacturing process. The students were able to see the raw sugar cane being unloaded, cleaned, and shredded into small pieces. They were also able to witness the process of extracting juice from the sugar cane, and the subsequent steps of clarification, evaporation, and crystallization. The students were impressed by the efficiency and scale of the operations at the sugar factory.

In addition to the tour, the students were also shown the various equipment and technologies used in the sugar manufacturing process, including boilers, turbines, centrifuges, and distillation columns. The staff at the factory explained the working principles and the advantages of the different technologies, and the students were able to ask questions and clarify their doubts. In conclusion, the industrial visit to the sugar factory in Shreepur was a successful and valuable learning experience for the students. The visit provided them with practical exposure to the sugar manufacturing process and the various technologies and equipment used in the industry. The students gained insights into the different job roles and



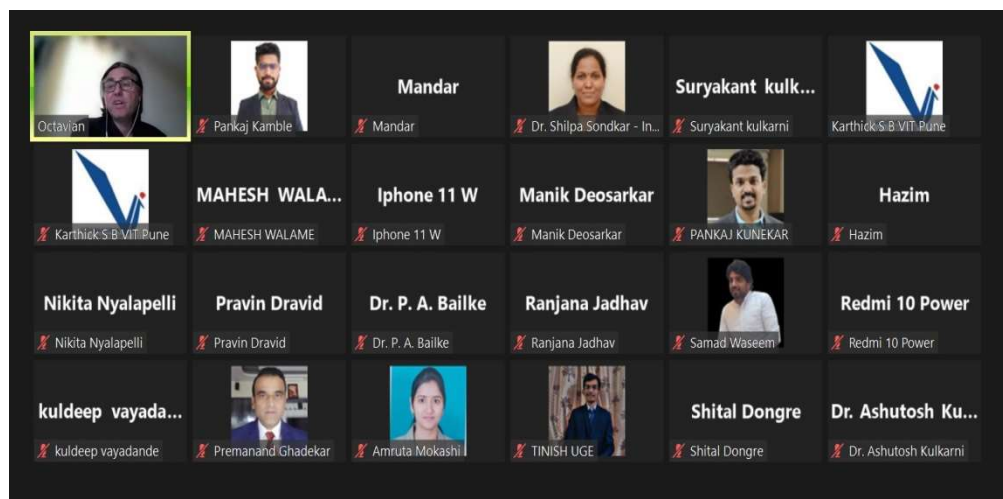
functions within the factory, and appreciated the importance of the sugar industry. The department IEEE IMS VIT PUNE CHAPTER hopes to organize similar visits in the future.

### Glimpses of the Industrial Visit



## 6. IEEE IMS Distinguished Lecture on Smart Sensing Systems and AI for Precision Agriculture in Climate

The DL was held on 31<sup>st</sup> March 2023 at 3.30 pm in online mode via zoom meeting platform.



## 4. International Conference on Industry 4.0 Technology (I4Tech2022) 22<sup>nd</sup> Sept -24<sup>th</sup> Sept 2022

The International conference on Industry 4.0 Technology 2022 was organized by the Department of Instrumentation Engineering, Vishwakarma Institute of Technology Pune from

22<sup>nd</sup> to 24<sup>th</sup> Sept 2022. The conference was technically sponsored by IEEE Pune Section, IEEE IMS Pune Chapter and IEEE IMS VIT Pune Students Chapter.

The Conference received an overwhelming response, 330 research papers were submitted on the Conference portal hosted on Microsoft Conference Management Portal (CMT). From the 330 papers, 168 papers were rejected in the rigorous peer review process, including 13 review or survey papers, 43 papers were desk rejected due to plagiarism, 20 papers were withdrawn. 85 papers were informed of the acceptance in two stages and out of which 67 papers were registered. Out of the 67 registered papers, around 30 papers were registered by IEEE student members or IEEE members and remaining 37 by non-IEEE members.

The conference received papers from all most all parts of India. Two papers were received from abroad. One of the authors was from Germany and another from Bangladesh. The conference received papers from eminent institutes from all over the country among which we can name a few as IIT Indore, NIT Kurukshetra, NIT Sibpur, Delhi Technology University, Anna University and many others.

Following major tracks were defined under the Industry 4.0 Technology: Sensors and technology, Signal and image Processing, Automation and control, networks and communication, Artificial intelligence, Internet of Things, Big Data Analytics, Data Science and Analysis and Standardization and interdisciplinary aspects. The conference received papers from almost all the areas mentioned with more response in the artificial intelligence and machine learning track.

Around more than 70 researches from industry and educational institute helped the conference for conducting a rigorous peer review.

The conference kick started with the pre-conference tutorial on 22<sup>nd</sup> Sept 2022. The tutorial was planned in 3 sessions. The first session of the tutorial was conducted by Mr. Niraj Jain and Ms. Shweta Prasad by Ethosh Digital. The second session was conducted by Dr. Shri Chandra from IEEE. The third and the last session were conducted by Mr. Nikhil Sonavane from Matlab. There were around 20 attendees for the preconference tutorial among these 7 were IEEE members and 13 non IEEE members.

The conference was conducted in the hybrid mode. The inauguration of the conference was on 23<sup>rd</sup> Sept 2022 with eminent key note sessions and expert talk. The first keynote session was by Prof. Dr. Daniel Watzeing, Graz University, Austria. The Second keynote was by Prof. Dr. RamkrishanPasumarthy, IIT Chennai. An Expert talk on research using IEEE Xplore was conducted by Dr. DhanukumarPattanshetti, Bengaluru. The first day of the session ended with online keynote session by Prof. Dr. Ashutosh Dutta, John Hopkins University. Both on campus and online mode of paper presentation was conducted with total 6 sessions. The second day of the conference 24<sup>th</sup> Sept 2022 was conducted in online mode with four paper presentation sessions. The conference ended with online keynote by Prof. Dr. Mathias Bonmarin from Zurich University.

**Pre-conference Tutorial, Thursday, 22<sup>nd</sup> Sept 2022**

It consisted of 3 sessions by industry experts. For the conference tutorial, students and faculty across the engineering colleges and authors were the attendees. The first session was on “Customer Engagement in Metaverse” by experts Niraj Jain, customer engagement expert, Ethosh and Shweta Prasad, technology expert, from Ethosh Digital. The tutorial sessions started with a welcome speech and were followed by a felicitation. Prof. Dr. Shilpa Sondkar, Head of Instrumentation Department, welcomed and felicitated Mr. Ravi Palekar, the Head of Learning and Development, from Ethosh. Thenafter, Prof. Manisha Mhetre, the Incharge of IEEE Tutorial Committee felicitated Mr. Niraj Jain and Ms. Shweta Prasad. And Prof. Archana Chaudhari, In charge of IEEE IMS VIT Chapter felicitated Mr. Srikant Chandrasekaran with a bouquet. They gave a brief idea about the Creation, Exploration, Collaboration and Connection of Metaverse as well as the multiple scenarios in a verse. Also, Internet Evolution of Metaverse was explained. The session concluded with a feedback.



Felicitations of Experts from Ethosh by Prof. Mandar Khurjekar, Chairman IEEE IME Pune Chapter

The second session was on “Importance and Impact Of IEEE Standards On Emerging Technologies” by industry expert Mr. Srikant Chandrasekaran, Senior Director and practice lead, foundational technologies IEEE Standards Association. Mr. Mandar Khurjekar, Chairman, IEEE IMS Pune Chapter felicitated the expert. He explained, Importance of IEEE Standards and Technologies such as LTE, WiFi and Solid State devices like Semiconductors. The IEEE Standards used in Cellphones was also talked about. This session was also ended with feedback.



Welcome and Felicitation of Mr. Srikant Chandrasekaran by Head of Department Prof. Dr. Shilpa Sondkar



Session by Mr. Srikant Chandrasekaran in progress

The third session was on “Hands on Session on MATLAB”, conducted by the expert Mr. Nikhil Sonavane, Education Technical Evangelist at MathWorks. Prof. Mrs. Archana Chaudhari, Convener, IEEE Conference felicitated the expert. He explained and taught basic to advanced knowledge about toolbox in MATLAB along with actual implementation in MATLAB.



Felicitation of Mr. Nikhil Sonavane expert from Matlab by Dr. Archana Chaudhari



Session by Mr. Nikhil Sonavane expert from Matlab in progress

The tutorial sessions were concluded with vote of thanks delivered by HOD of Instrumentation department, Prof. Dr. Shilpa Sondkar.

### Day 1 of International Conference, Friday 23<sup>rd</sup> Sept 2022

Following dignitaries attended the conference: Prof. Dr. Daniel Watzeing, Graz University Austria, Prof. Dr. Ramkrishna Pasumathy, IIT Chennai, Mr. Girish Khilari, IEEE Pune Section Chairman, Prof. Mandar Khurjakar, Chairman IEEE IMS Pune Chapter, Prof. Dr. Vivek



Deshpande, Director Vishwakarma Institute of Information Technology Pune and Mr. BajrangdasLohia.



Dignitaries on the dais

The conference was inaugurated by the following dignitaries: Prof. Dr. Daniel Watzeing, Graz University Austria, Prof. Dr. RamkrishnaPasumathy, IIT Chennai, Mr. Girish Khilari, Prof. Dr. Vivek Deshpande, Mr. BajranjdasLohia and Prof. Dr. Vivek Deshpande, Director Vishwakarma Institute of Information Technology Pune.



Address by Prof. Dr. Shilpa Sondkar, Head of the Instrumentation Engineering

The conference was attended by the students of the Instrumentation Engineering department and few other departments in the Institute. It was also attended by different Heads of the Department of the Institute. The conference saw a foot fall of more than 100 attendees including students and other guests. Among the attendees of the conference more than 30 attendees were IEEE members or IEEE student members and remaining 70 were non-IEEE members.

The International Conference inauguration started with Saraswathi Poojan by the dignitaries. The welcome address was given by Conference Chair, Head of Instrumentation Engineering Department Prof. Dr. Shilpa Sondkar. Dr. Shilpa Sondkar presented an overview of the institute a brief about the conference. The dais welcomed the IEEE Pune Section Chairman Mr. Girish Khilari and felicitated him. In his speech Mr. Girish Khilari presented an overview of all the IEEE Pune section activities conducted around the year. He also inspired all the and motivated the forum to conduct such conference on Industry 4.0 as it was an upcoming area and need of the hour.



#### Saraswathi Poojan by the Dignitaries

The dais then felicitated Prof. Dr. Daniel Watzeing at the hands of Honorable Mr. BajrangdasLohia sir. Felicitation of Prof. Dr. RamkrishnaPasumarthy was done by Prof. Dr. Vivek Deshpande, Honorable Director Vishwakarma Institute of Information Technology Pune. The conference proceedings were inaugurated in the form of CD by the dignitaries on the dais followed by address from Honorable Mr. BajranjdasLohia Sir.



Felicitating of Mr. Girish Khilari, Chairman  
IEEE Pune Section



Address by Mr. Girish Khilari, Chairman  
IEEE Pune Section

Prof. Dr. Daniel Watzeing, Graz University Austria presented the first keynote of the International Conference on the topic **Multi-sensor Perception and Data Fusion**. The challenges faced by single sensor and the role of multiple sensors in autonomous vehicles were presented. The need of data fusion and techniques of multi-sensor data fusion along with the limitations were the highlights of the keynote speech.



Felicitating of Prof. Dr. Daniel Watzeing, Graz University Austria by Hon. Bajranjdas Lohia

Prof. Dr. Ramkrishna Pasumarth, IIT Chennai presented the second keynote of the International Conference on the topic **Control in the world of Networks**. His keynote highlighted the role of Control in different types of networks in the real time scenario with a focus on Brain networks.





Felicitation of Prof. Dr. Ramkrishna Pasumathy, IIT Chennai by Prof. Dr. Vivek Deshpande, Director Vishwakarma Institute of Information Technology Pune

The third expert talk was conducted by Dr. Dhanukumar Pattanshetti, Senior IEEE Clinet Services Manager, IEEE India Operation Center, Bengaluru on the topic **Inspiring Research and Innovations Using IEEE Publications**. The session was very interactive and the attendees got an insight into the number of IEEE publications and how to make use of the publications on IEEE for research work.



Inauguration of Conference proceedings by the dignitaries on the dais

After the keynote and expert talks the authors presented the paper in the session. Since the conference was conducted in online mode, one paper presentation session was planned on campus in the Institute at the Department of Instrumentation Engineering in the Signal Processing Lab.





Address by Honorable Bajrangdas Lohia

The Session One was the on-campus paper presentation session. It had total 8 papers. One of the authors who presented the paper was a PhD Scholar from Karlsruhe University,



Keynote address by Prof. Dr. Daniel Watzeing, Graz University, Austria



Keynote address by Prof. Dr. RamkrishnaPasumarthy, IIT Chennai Germany. Three authors from the session represented VJTI Institute Mumbai and the remaining authors were from College of Engineering Pune. Among the eight authors who presented the papers, one author was IEEE student member and remaining were IEEE nonmembers. The Session was chaired by Prof. Dr. Daniel Watzeing, Graz University Austria, Prof. Dr. RamkrishnaPasumarthy, IIT Chennai. Two papers were selected by the Session Chairs as the Best papers of the International Conference. The track named Artificial Intelligence and Machine Learning was conducted in three parallel sessions as session 2A, session 2B and session 2C in online mode on Google meet.



Feliciation of Dr. Dhanukumar Pattanshetti,  
Expert from IEEE



Expert talk of Dr. Dhanukumar Pattanshetti,  
Expert from IEEE





On campus paper presentation of session 1 by authors



On campus paper presentation of session 1 by authors

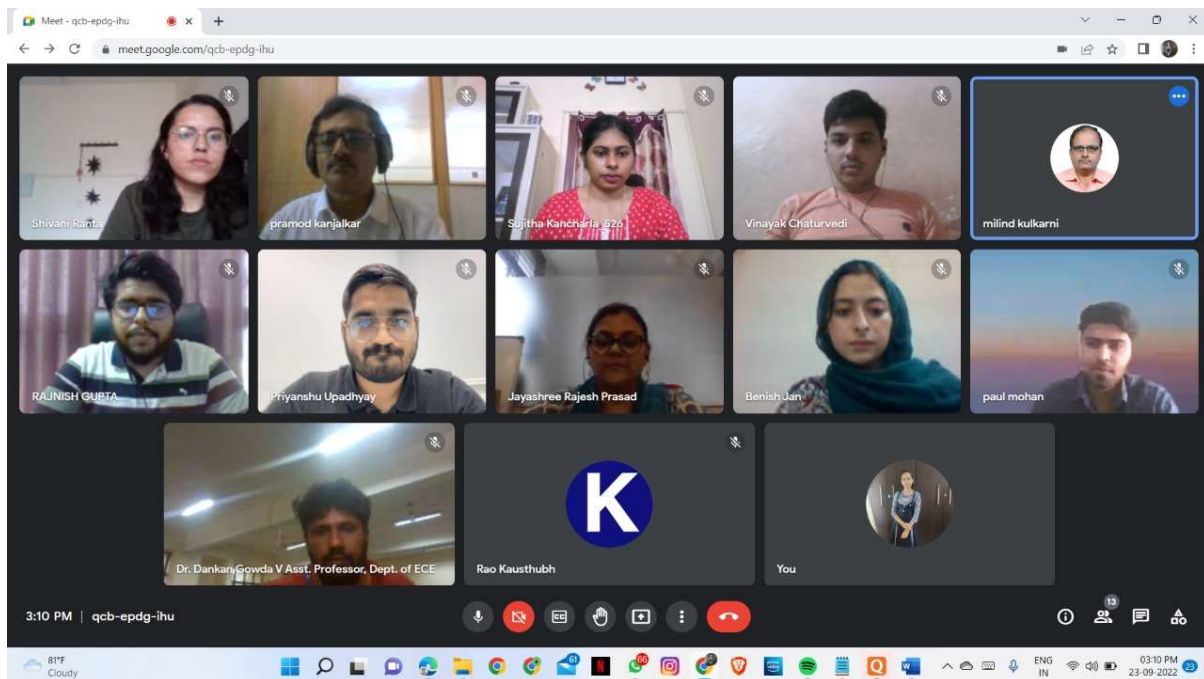


Certificate distribution for session 1





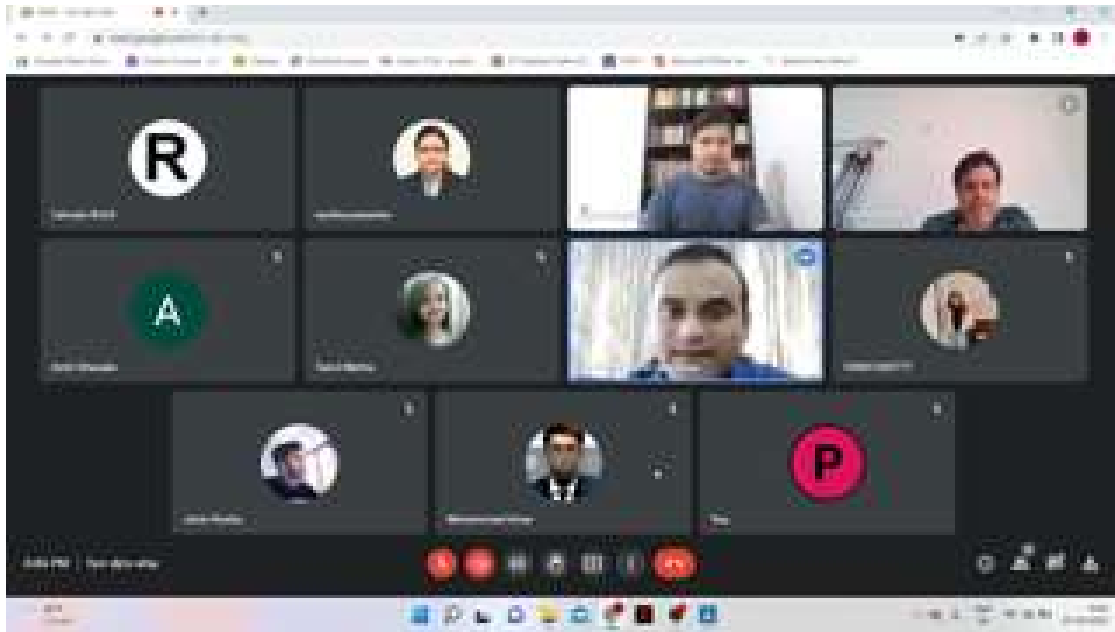
Dr. Jayashree Prasad from MIT World Peace University, Pune and Dr. Milind Kulkarni from Vishwakarma Institute Technology, Pune chaired the session 2A and 7 papers were presented in the session. Among the 7 authors one author was IEEE member and remaining authors were non-IEEE members.



Screenshot of attendance of session 2A

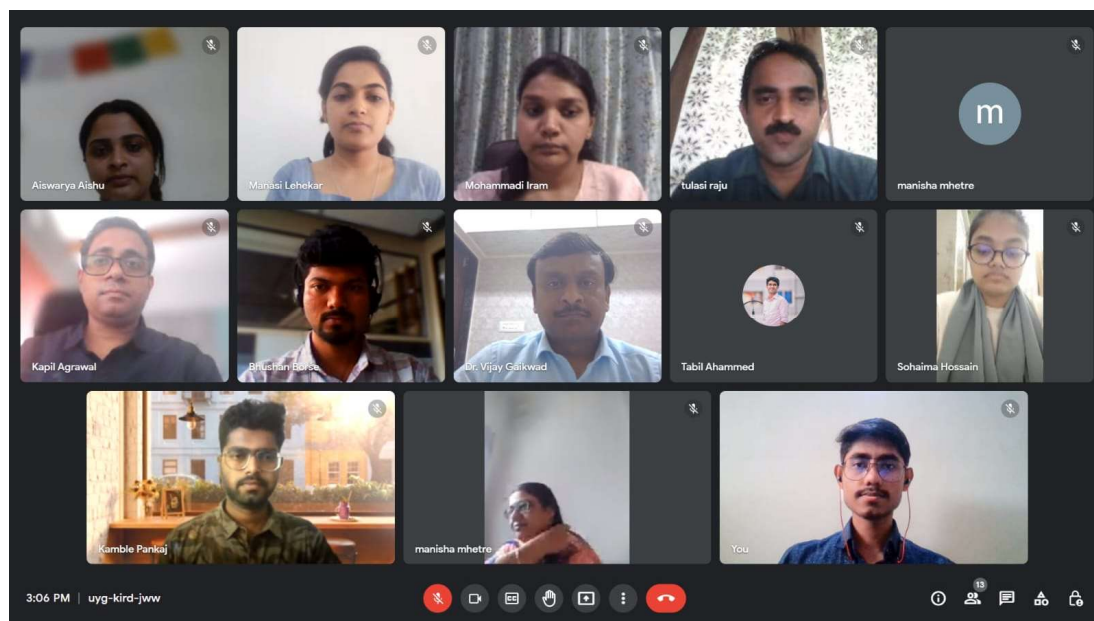
Mr. Kunal Gauraw from John Deere and Dr. Premanand Ghadekar, Head Information Technology Department, Vishwakarma Institute of Technology chaired the session 2B and 7 papers were presented in the session. Among the 7 authors two authors were IEEE member and remaining authors were non-IEEE members.





Screenshot of attendance of session 2B

Mr. Kapil Agrawal Head and CEO Velotio Technologies and Dr. Vijay Gaikwad, Dean Quality Assurance, Vishwakarma Institute of Technology chaired the session 2C and 7 papers were presented in the session. Among the 7 authors one author was IEEE member and remaining authors were non-IEEE members.



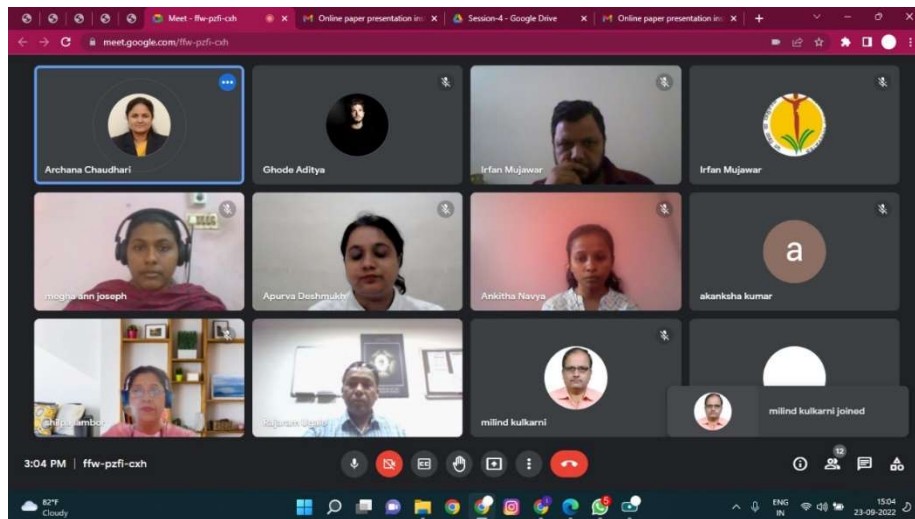
Screenshot of attendance of session 2C

Session 3 was based on the papers in the area of Security and Block Chain and Cloud. Dr. ErudiyaSandeepkumar from Bosch and Dr. Sandeep Shinde, Head Computer Engineering Department, Vishwakarma Institute of Technology chaired the session 3. 7 papers were presented in the session. Among the 7 authors one author was IEEE member and remaining authors were non-IEEE members.



Screenshot of attendance of session 3

Session 4 was based on the papers in the Energy and Electrical engineering. Dr. Rajaram Ugale from College of Engineering Pune and Dr. Shilpa Lambor from Vishwakarma Institute of Technology Pune chaired the session 4. Total 5 papers were presented in the session nonof the authors as IEEE member.



Screenshot of attendance of session 4

The first day of the conference ended with an online keynote by Prof. Dr. Ashutosh Dutta from John Hopkins University, Baltimore on the topic **5G network security and applications** via zoom meeting link. The keynote focused on the challenges in the security of 4G networks and how theyare overcome by the 5G and applications of 5G networks. This session was attended by around 28 participants. Around 15 participants were IEEE members and remaining non-IEEE members.



Keynote Session 3 in online mode by Prof. Dr. Ashutosh Dutta, John Hopkins University, Baltimore

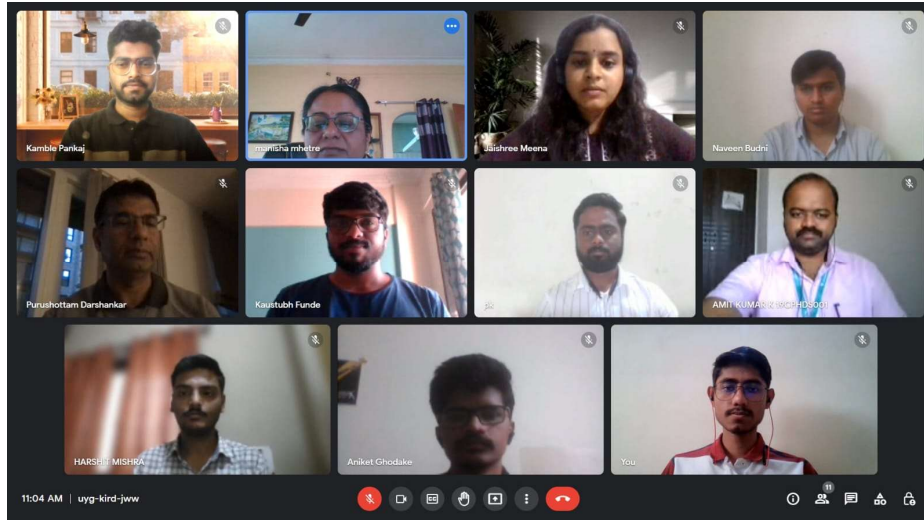


Faculty and Volunteers attending online keynote session 3 in the lab

### **Day 2 of the International Conference Saturday 24<sup>th</sup> Sept 2022**

Day 2 of the international conference started with 4 parallel online paper presentations; session 5 to session 8 via Google meet.

Session 5 was based on the papers in the area of Artificial Intelligence and Machine Learning. Mr. Purushottam Darshankar from TCS chaired the session. 8 papers were presented in the session. Among the 8 authors one author was IEEE member and remaining authors were non-IEEE members.



Screenshot of attendance of session 5

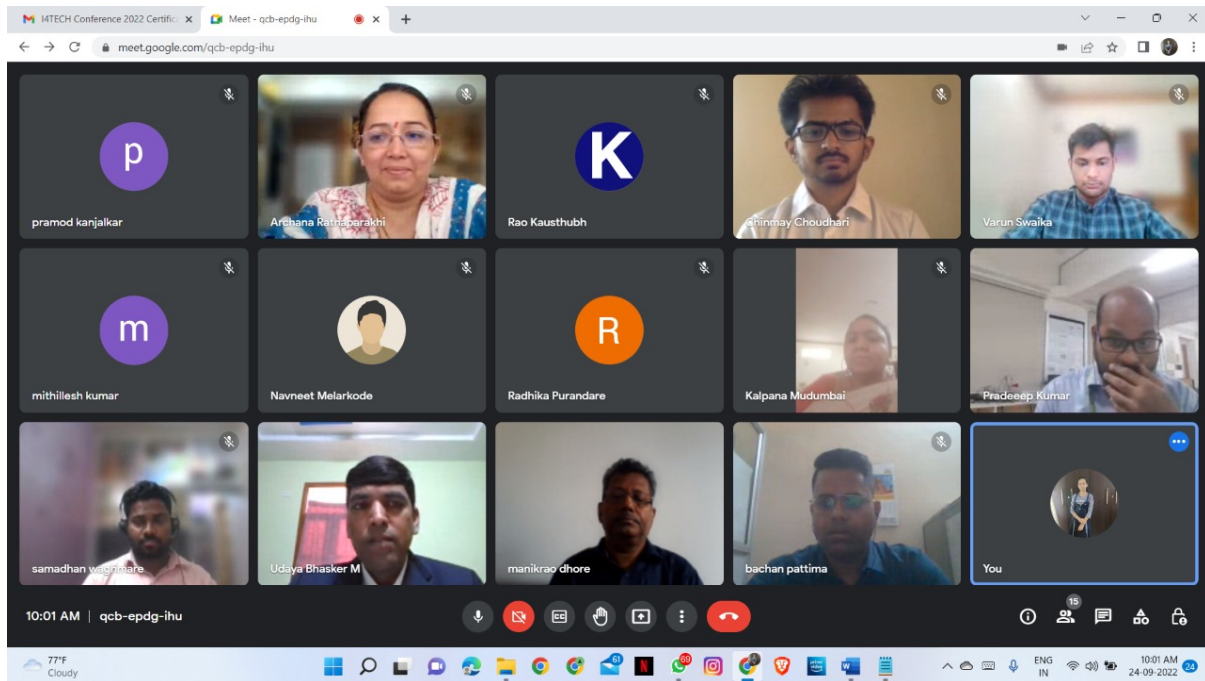
Session 6 was based on the papers in the area of Sensors, automation and control. Mr. Ajay NagarkarAcconet chaired the session. Papers were presented in the session. Among the 7 authors one author was IEEE member and remaining authors were non-IEEE members.



Screenshot of attendance of session 6

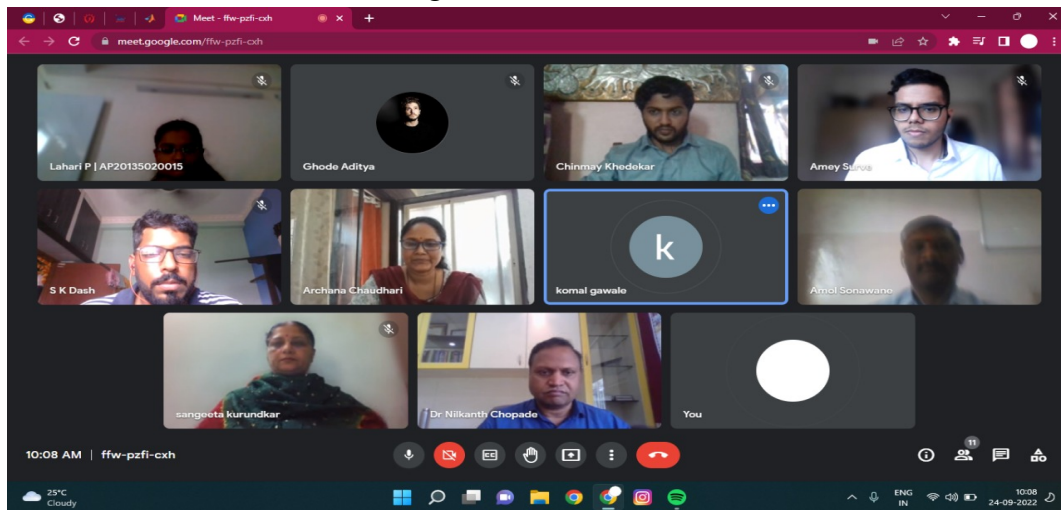
Session 7 was based on the papers in the area of Networks. Dr. Uday Bhaskar NIT Warangaland Dr. ManikraoDhore Vishwakarma Institute of Technology Pune chaired the session. 9 papers were presented in the session. Among the 9 authors two author were IEEE student member and remaining authors were non-IEEE members.





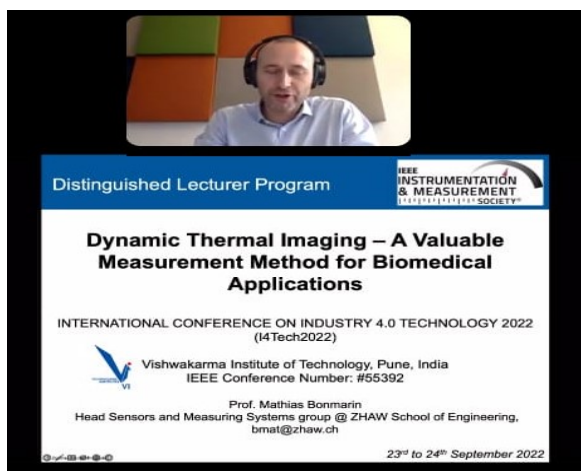
Screenshot of attendance of session 7

Session 8 was based on the papers in the area of Communication. Dr. Nilkanth Chopade Deputy Director, PCCOE College and Dr. Sangeeta Kurundkar Vishwakarma Institute of Technology Pune chaired the session. 8 papers were presented in the session. Among the 8 authors one author was IEEE student member and remaining authors were non-IEEE members.



Screenshot of attendance of session 8

The second day of the International Conference ended with the Keynote session by Prof. Dr. Mathias Bonmarin, Zurich University of Applied Science on the topic **Dynamic Thermal Imaging- A valuable measurement method for Biomedical Applications**. The keynote was conducted via zoom meeting link and it was attended by around 30 participants. Among the 30 participants 22 participants were IEEE members and remaining IEEE non-members.



Keynote session 4 of International Conference on Industry 4.0 by Prof. Dr. Mathias Bonmarin on 24<sup>th</sup> Sept 2022

The conference concluded with the announcement of the Best paper awards by Prof. Dr. Mathias Bonmarin. The five papers which were announced as best papers are as follows

Paper titled Application of Federated learning in manufacturing presented by international author Vinit Hegiste.

Paper titled Deep Convolution Neural Network based classification of microscopic images of environmental micro-organisms presented by author Amit Dhavale.

Paper titled Design and simulation of GPD RF lattice and ladder type SAW Filter presented by Samadhan Waghmare.

Paper titled ANN based multi binary classification technique for incipient fault diagnosis of oil immersed transformer presented by Benish Jan.

Paper titled Robust and Compact end-to-end Hindi language ASR system presented by Hruturaj Nikam.

The second day of the Conference ended by vote of Thanks.

## 6. Expert Lectures conducted in the Department

### A. Expert lecture by Mr. Ajit Borude conducted on 14<sup>th</sup> March 2023 on Current Scenario and applications of projects for Web Technology

Dr. Archana Chaudhari organized expert lecture for Third Year students studying web technology course. The expert guided on the current scenario on placement and internships in Web Technology domain. More than 50 students attended the expert lecture.



Welcome address by the Head of the Department and expert Mr. Ajit Borude conducting lecture on Web Technology

**B. Mr. Shaunak Deshpande Alumina of Instrumentation Department conducted lecture on how to prepare for internships and placement for INFINION company campus placement**

Prof. Kapil Mundada organized expert lecture for Third Year students. The expert guided on the current scenario on placement and internships in INFINION. More than 60 students attended the lecture.



## 7. Services to Community extension Activities

### **A. Visit to Poona Geriatric Care Center, Pune**

On March 14, 2023, the students and Prof. Dr. Manisha Mhetre from Department of Instrumentation and Control Engineering visited the Poona Geriatric Care Center, Pune, which is a home for senior citizens who have been brain disease and need extra care and therapy.

The purpose of the visit was to interact with the elderly residents of the center, and to conduct some brain games and activities to encourage them. The visit began at around 10:30 am and lasted for about three hours.



Upon arrival, the students and Professor were greeted by the Dr. Santosh Kanshetty (Founder & Managing Director), Dr. Ashwini Gawande ma'am (Caretaker of the Orphan) and respective staff of the center and introduced to the lovely senior residents. The students and Professor donated some snacks to the center, which were warmly received by the staff and residents alike. Event had great start by introducing each other in a very nice way.





The students then started with the memory based activities by playing some unique brain games, including dumb charades based on old Bollywood songs and allowing orphan residents recognize their favorite actors and actresses based on the images of actors. The residents were very enthusiastic and participated actively. They enjoyed the activities very well.



After the games, the team played chess with the residents, and helped orphan staff serve their lunch. The interaction with the elderly residents was very heartwarming and gave a sense of satisfaction to the students and faculty members.

Towards the end of the visit, the event ended at around 1:30 pm, and the team returned to the college, feeling satisfied and content with the experience.

Overall, the visit to the Poona Geriatric Care Center was a great success. The team was able to engage with the elderly residents and bring a smile to their faces, even if only for a few hours.

The event helped raise awareness of the need to care for the elderly in our society, and the team hopes to conduct more such visits in the future.

### **B. Microcontroller Workshop for Students of Sumati Balwan School for Underprivileged**

A microcontroller workshop was organized by the Instrumentation Department VIT Pune for Sumati Balwan High School's underprivileged children. On March 23, 2023, in Sumati Balwan School in Gujar, Nimbalkar Wadi, the session got underway at 11 a.m. The workshop's objective was to give the students a fundamental understanding of sensors, Arduino, and microcontrollers. It was organized for 30 students in grades 8 through 10. Third year and second year students of the department volunteered the same along with faculty coordinator Prof. Dr. Sanika Patankar. The purpose of the seminar was to introduce the idea of microcontrollers and some of their uses. The lesson explored the fundamentals of microcontrollers and Arduino, including their uses in different electronic devices and programming languages. Information about various sensors, embedded C, and their applications is also provided. Overall, the lesson was a huge success since it gave the Sumati Balwan High School students a fun and engaging approach to learn the fundamentals of microcontrollers, sensors, and their applications.

#### **Glimpses of the extension activity**



