

**Report on Online Kaizen 2020**  
**Department of Instrumentation and control Engineering**  
**L. D. College of Engineering-Ahmedabad**

**1. Brief Description of the event:**

The online Kaizen 2020 for Instrumentation & Control Engineering Department was conducted with 5 panels of faculties reviewing all the teams of final year IDP/UDP projects on dated 9<sup>th</sup> April, 2020 through Zoom meeting app. Total 14 faculty members had reviewed 23 teams (total 65 students) as per the schedule given below.

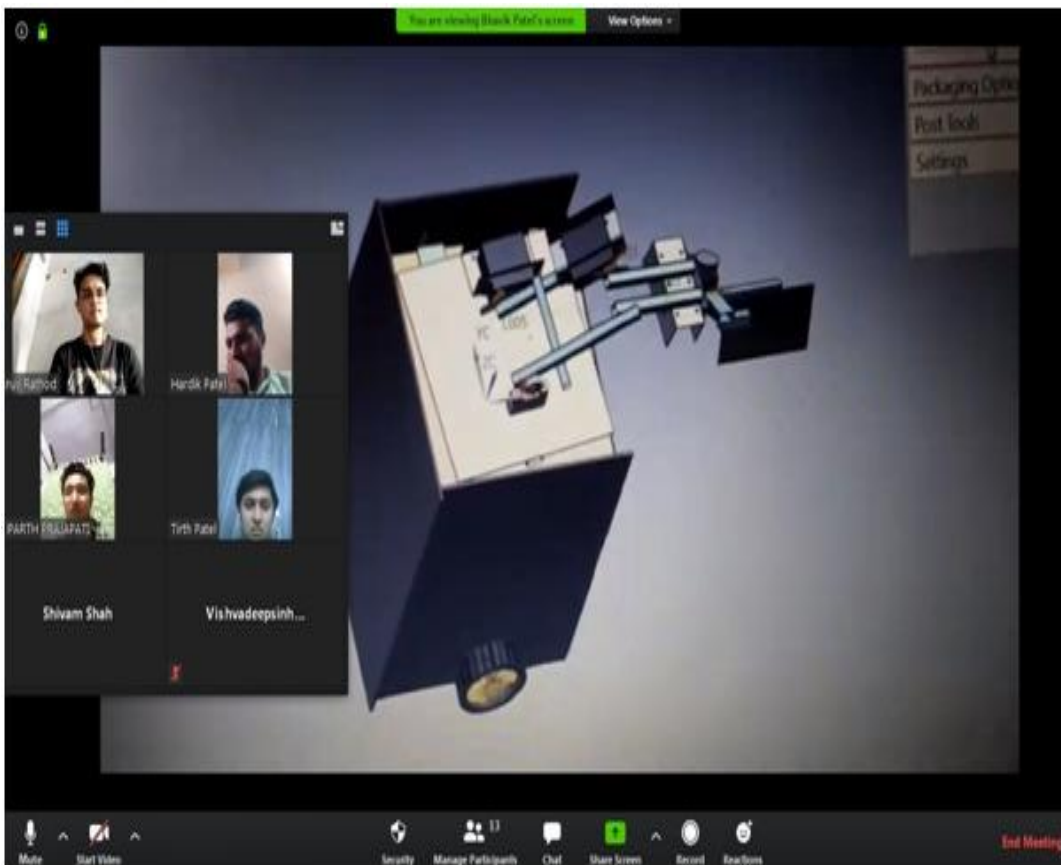
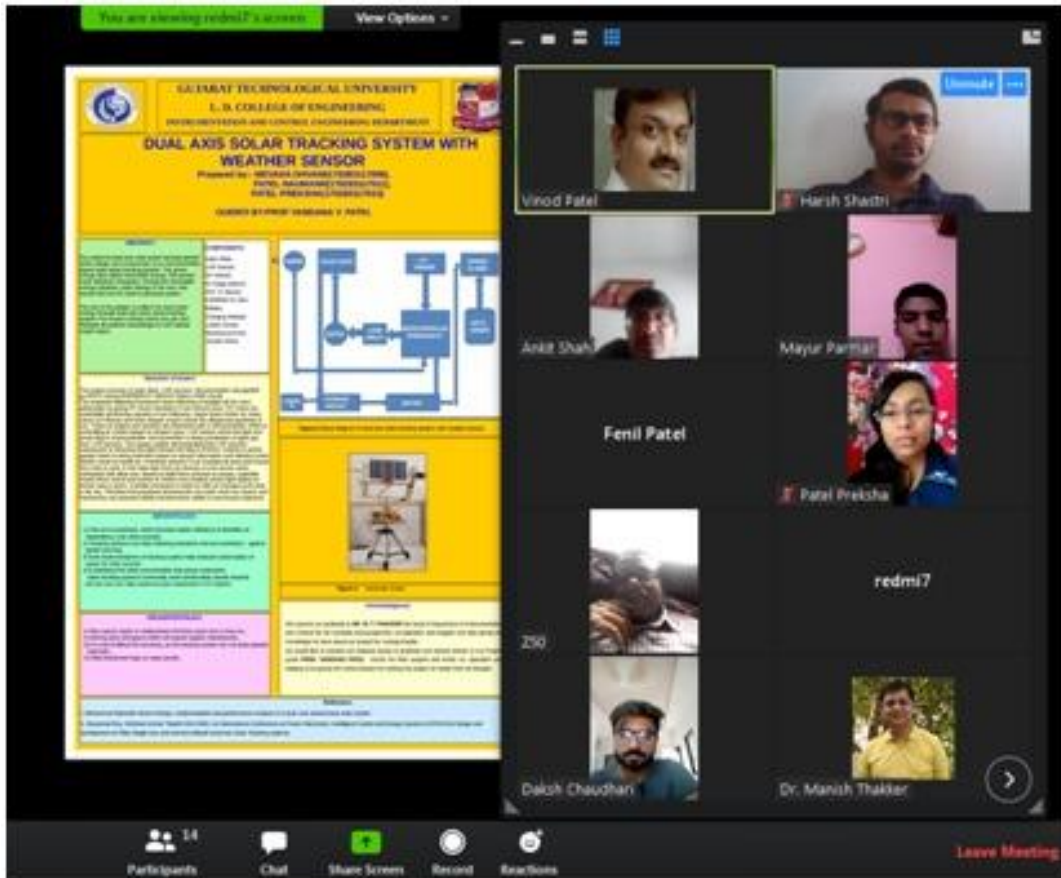
Sr no	Date & Time	Project Title	Guide	Sr. no	Enroll no	Student Name
1	09-04-2020 11:00	Liquid level control system using microcontroller based PID controller	Dr. R.C. Patel	1	160280117014	Gohil nayanpalsinhb havsinhbhai
				2	160280117010	Devmurari Yogesh Parshotambhai
				3	160280117008	Chavadaparije etsinhrajendra sinh
2	09-04-2020 11:10	Micro Controller Based Multi Channel Temperature Measurement And Control Using Pid Control	Dr. R.C. Patel	1	160280117060	Vaghasiya Meet Kiritbhai
				2	160280117001	Ajudiya Nirav Bharatbhai
				3	160280117005	Bhaliyajaimin vinubhai
3	09-04-2020 11:20	Smart ID Card	Prof. V.P.Patel	1	160280117032	Parmar Pranay Nileshkumar
				2	160280117056	Soni Jainish Mahendrakumar
				3	160280117022	Kothari kenilkiranbhai
4	09-04-2020 11:30	Robotic Assistant	Prof. V.P.Patel	1	160280117034	Patel Bhavik Bharatbhai
				2	160280117043	
				3	160280117046	Rathod Dhruv Pareshbhai
5	09-04-2020 11:40	Dual Axis Solar Tracking System With Weather Sensor	Prof. V.P.Patel	1	170283117009	Mevadadhvan ivasantkumar
				2	170283117013	Patel prekshachirag

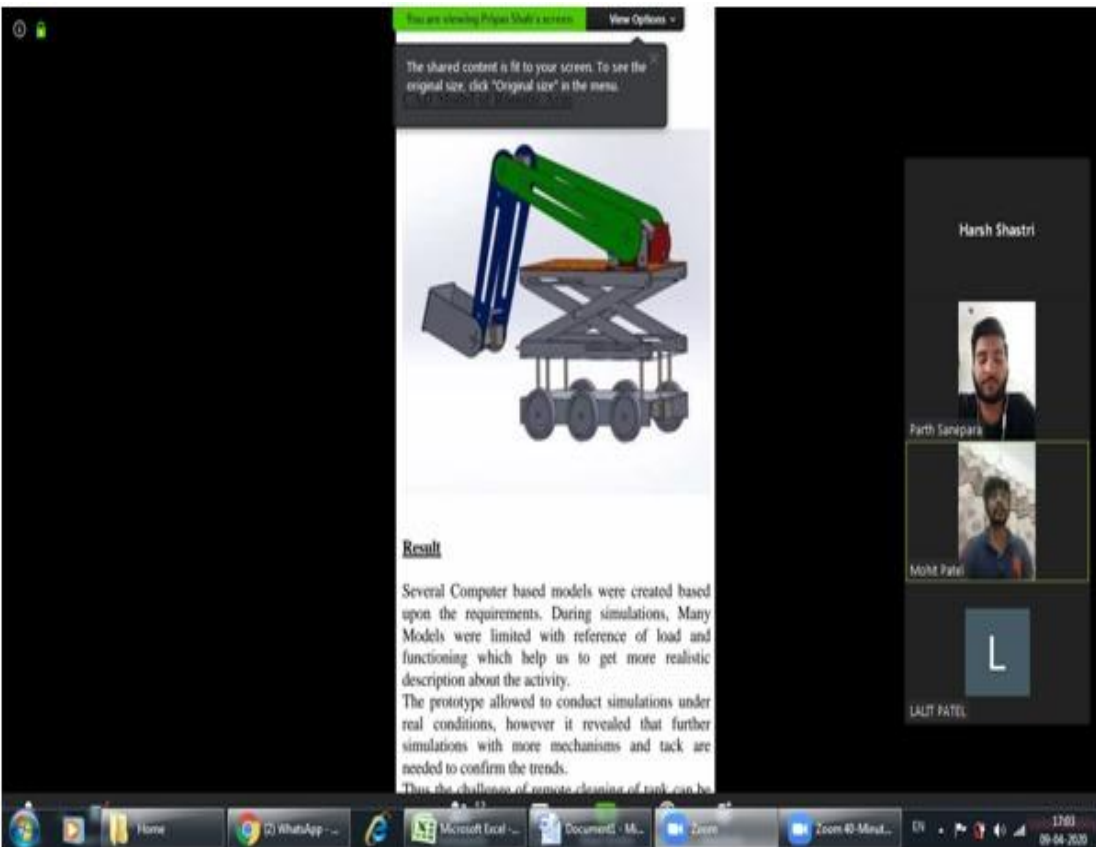
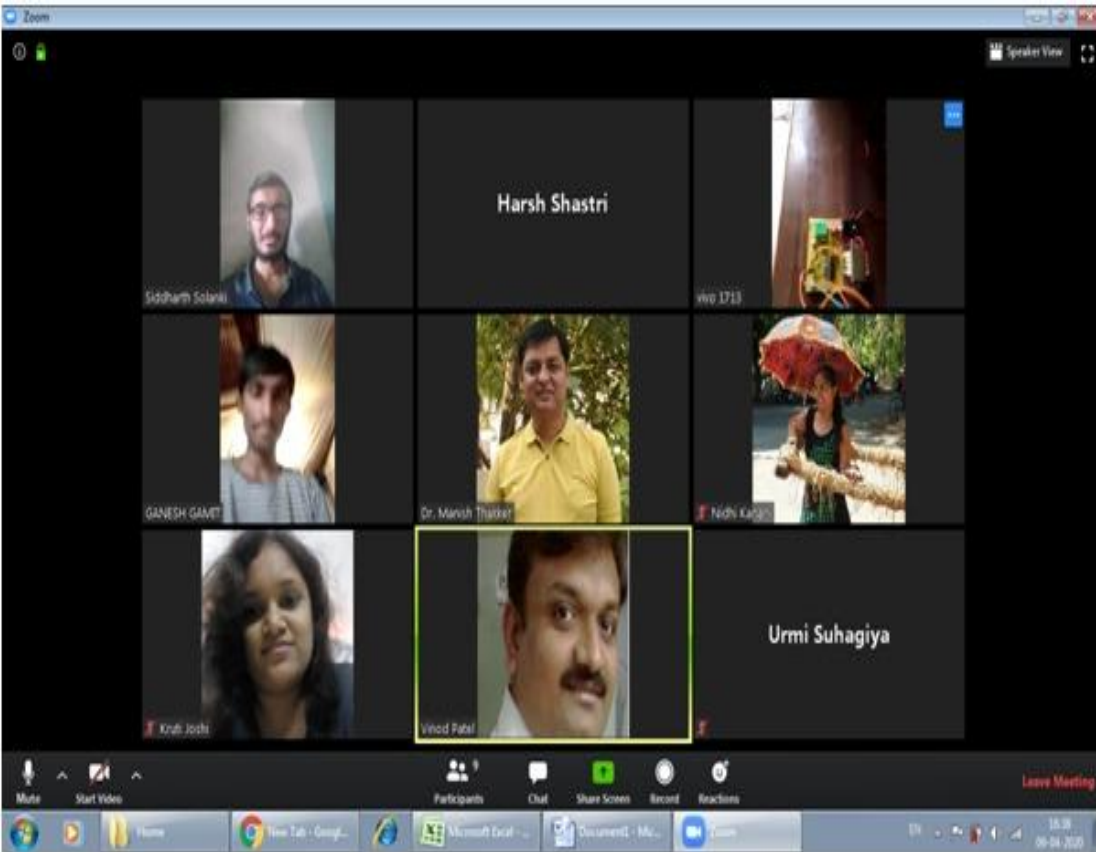
						bhai
				3	170283117011	Patel Nauman Nazeer
6	09-04-2020 11:50	Density based automatic traffic control system	Prof.V.P.Patel	1	160280117038	Patel fenildilipkumar
				2	160280117031	Parmar Mayur Natvarlal
				3	160280117006	Chaudhari dakshkumarc heljibhai
7	09-04-2020 12:00	Techocleaner	Dr.A.K.Shah	1	160280117026	Nayan Bhola
				2	160280117027	Nihardhokai
8	09-04-2020 12:10	Temperature Measurement And Controller Using Pid	Prof.U.V.Shah	1	160280117020	Kasvala Ashish Maheshbhai
				2	160280117011	Finaviyahiren kumar Rameshbhai
				3	160280117015	Jethva mishalkumarr asikbhai
9	09-04-2020 12:20	DC motor speed control	Prof.S.N.Shah	1	160280117009	Dahivalkar Parikshit Sanjay
				2	160280117023	Koyani Tejas Mahendrabhai
10	09-04-2020 12:30	Automatic Water Distribution System using PLC	Prof.S.N.Shah	1	170283117004	Gondaliyajay dipvinubhai
				2	170283117006	Kathiriyadivy angghanshyambhai
11	09-04-2020 12:40	Heat Exchanger control using PLC	Prof.M.C.Patel	1	170283117008	Kumare Prashant Hemantbhai
				2	170283117012	Patel parthvasantbhai
				3	170283117015	Rohan Rathod
12	09-04-2020 12:50	Smart Wearable Device	Prof.M.C.Patel	1	160280117019	Kapoor Khushboo Kapil
				2	160280117024	Lunia Chandan Dilip
13	09-04-2020 4:00	accident detection and notification system for	Prof.K.R.Joshi	1	150280117048	Rathod Pragadesh

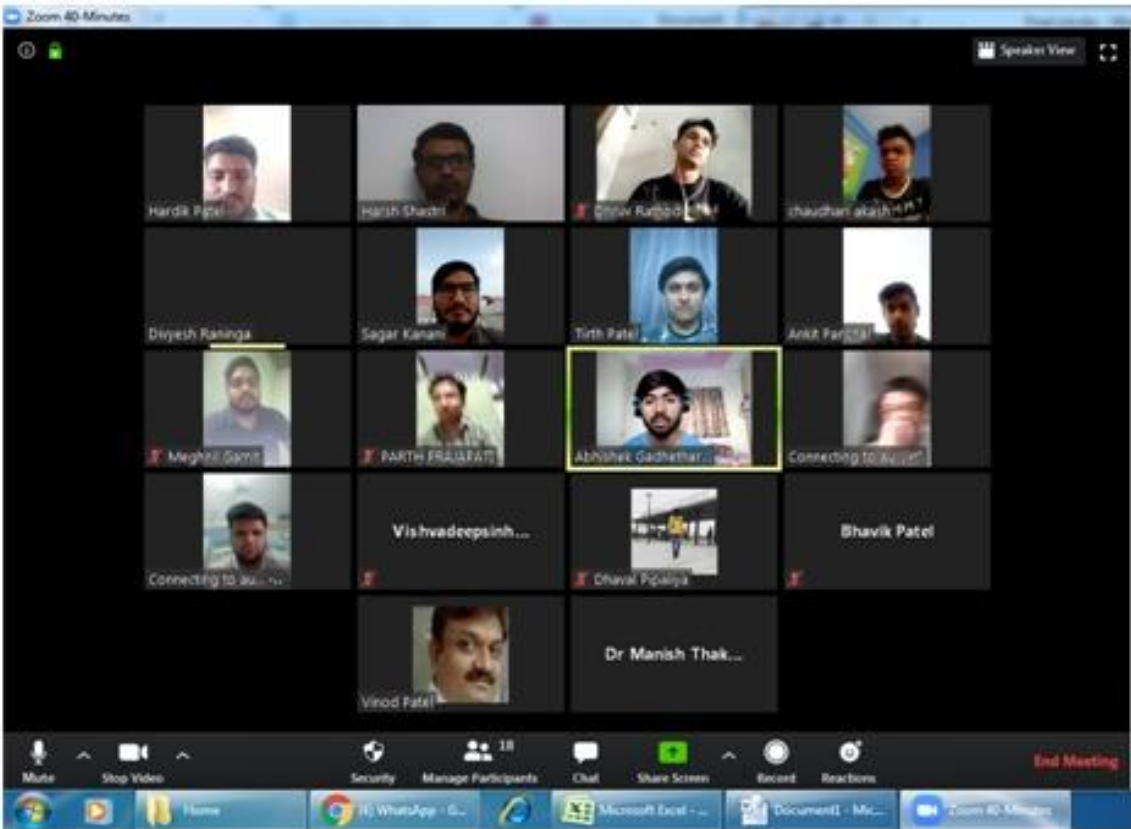
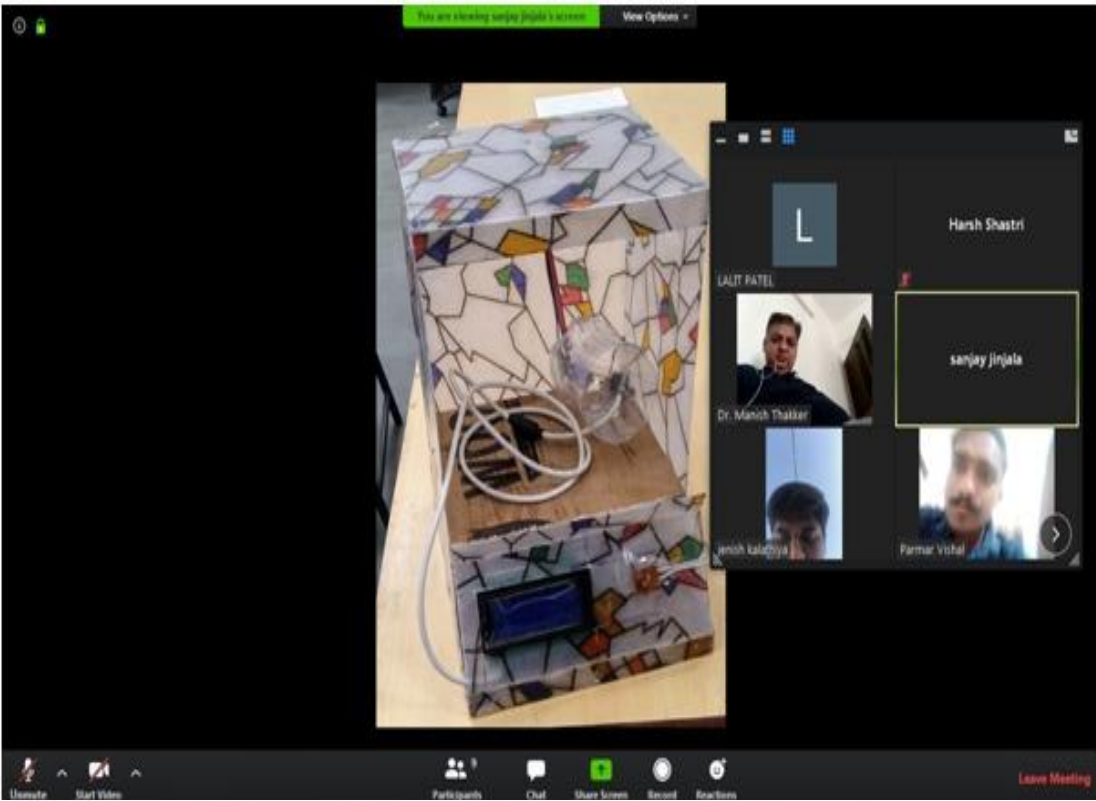
		motor – vehicles		2	160280117035	Patel bhavinbhaimaganbhai
				3	160280117030	Parmar jigneshkumarjayendrabhai
14	09-04-2020 4:10	Digital Visiting Card System	Prof.N.A.Kanani	1	160280117054	Solanki malharsinhani ruddhsinh
				2	160280117053	Solanki hiralkuvarbaindrasinh
				3	160280117055	Sonagaraankitkumarukabhai
15	09-04-2020 4:20	Wood fire boiler	Prof.U.G.Suhagiya	1	170283117014	Patel Ushaben Bhupendrabhai
				2	170283117003	Gamitganeshbhainileshbhai
				3	170283117017	SOLANKI SIDDHARTH RAJENDRA KUMAR
16	09-04-2020 4:30	Development of Data Acquisition system for clutch testing	Dr. M.T.Thakker	1	170283117018	Tandelpavitrakumarbharatbhai
				2	170283117005	Kamaliya Harshad Rameshbhai
				3	170283117010	Nakum Vishal Vitthalbhai
17	09-04-2020 4:40	Robotic arm	Dr. M.T.Thakker	1	160280117051	Shah priyandharmeshkumar
				2	160280117041	Patel Mohit Jitendrabhai
				3	160280117048	Saneparaparthkumarbhikhubhai
18	09-04-2020 4:50	Density meter	Prof.L.S.Patel	1	160280117016	Jinjalasanjaykumardulabhai
				2	160280117033	Parmar Vishal
				3	160280117017	Kalathiyajenishkumarbhupatbhai
				4	160280117064	Vivekjyoti Bhowmik
19	09-04-2020 5:00	GUI development using WINCC for cryoplant termination cold box	Prof.L.S.Patel	1	160280117025	Manipuzhapri thviraj Sankaran

		ANUJ GARG IPR 8980301523 <a href="http://www.ipr.res.in/documents/429.html">//http://www.ipr.res.in/documents/429.html</a>		2	160280117 028	Palkhiwala Shubham Darshitkumar
20	09-04- 2020 5:10	Smart greenhouse over IOT platform	Prof.D. V Raninga	1	160280117 012	Gadhethariya Abhishek Upendrabhai
				2	160280117 002	Antala Darshan Sureshbhai
				3	160280117 018	Kanani Sagar Bharatbhai
21	09-04- 2020 5:20	Imitating robotic arm	Prof.D. V Raninga	1	160280117 052	Shah shivammitesh kumar
				2	160280117 042	Patel Tirth Navnitkumar
				3	160280117 061	Valavishvade epsinhhardevs inh
22	09-04- 2020 5:30	smart waste water recycling system with rain water harvesting for domestic use	Prof.H.K.Shastrri	1	160280117 013	Gamitmeghnil
				2	160280117 007	Chaudhary akashkumarm anojbhai
				3	150280117 056	Tadavihiteshk umarkhushalb hai
23	09-04- 2020 5:40	Automatic Colour Based Object Sorting Machine	Prof.H.K.Shastrri	1	160280117 029	Panchal ankitbhaidine shbhai
				2	160280117 044	Prajapati parthharshadb hai
				3	160280117 039	Patel Hardikkumar Maheshbhai

Screenshots of the online kaizen 2020 through Zoom Meeting application.









## 2. Brief Detail of innovative projects having good industry/societal impact

- **Title: SMART ID-CARD**

### □ **GROUPDETAIL:**

<b>Enroll No:</b>	<b>Name Of the student</b>
160280117032	Parmar Pranay Nileshkumar
160280117022	Kothari KenilKiranbhai
160280117056	Soni Jainish Mahendrakumar

- ### □ **NAME OF INTERNAL GUIDE:** Prof. VINOD .P. Patel

### □ **ABSTRACT:**

In many MNCs, employs are not allowed to carry their mobile phones with them. There are some areas where use of mobile phones is restricted. So, under those conditions, there exists vast communication gap between Master and Slave. So, this project reduces the communication gap. The most important portion or the back bone of the project is the communication part. Here, in this project the Idea is based on the principal of Master and Slave. A person at the Managerial post have the excess and have the IP addresses of every particular individual with whom he is going to communicate and through the Wi-fi module they communicate with each other. The message is been displayed on the LCD screen on the ID Card. Here, we have used Node MCU which acts as a communication device over here. Node MCU is a combination of Controller and Wi-fi Module. So, through same Wi-fi Connectivity one can easily communicate. Here, we have also included Digital Authenticated Security Control System with the help of RFID Sensors. The Next Thing is the GPS System Through which one can monitor persons exact location. So, from its feature we can say it is working smartly. Also, we have included the safety alarm System in it.

### □ **PROJECT IMAGES:-**



- ### □ **TYPE OF PROJECT:** - UDP

**Prof. VINOD .P. Patel**  
Internal Guide (I.C Dept.)



□ **Title: SMART WEARABLE DEVICE – “SAATHI”**

□ **GROUPDETAILS:**

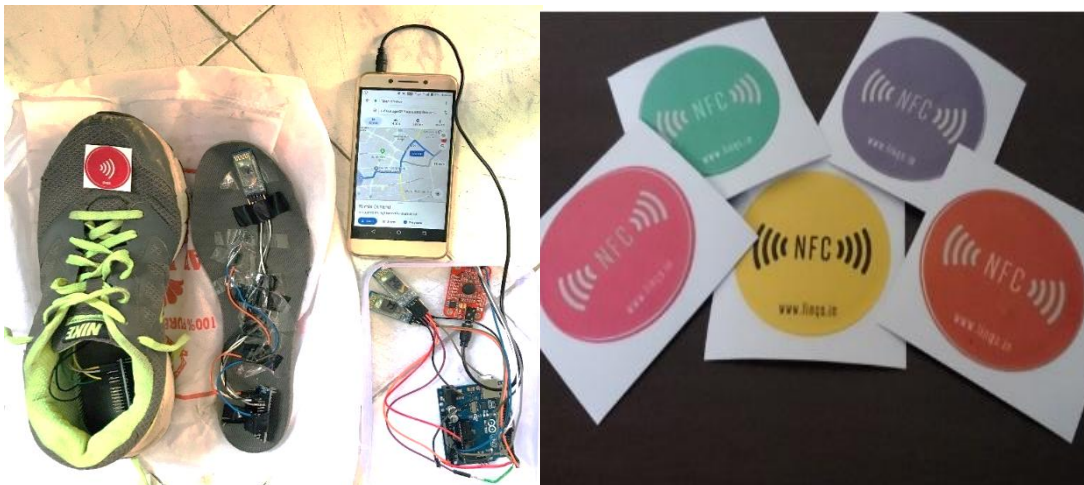
<b>Enroll No:</b>	<b>Name Of the student</b>
160280117019	Kapoor Khushboo Kapil
160280117024	Lunia Chandan Dilip

□ **NAME OF INTERNAL GUIDE:** Prof. MANISHA PATEL (I.CDept.)

□ **ABSTRACT:**

Travelling for blind people, old people, and differently abled can be a very difficult task. In today's time, with so much traffic on roads, it can be difficult for them to cross roads, reach their destination, that too hassle-free. Also, another problem involves people commuting on two wheelers, if they don't know the route it becomes very difficult for them to take out their phone and check the route every now and then. This can also cause accidents. For this, we have designed a solution that can work for this category of civilians as well. Smart wearable device includes smart shoes that can solve the problems stated above. It will guide them with the route and notify when the destination is reached. Secondly, for two-wheeler drivers, they can set their destination on maps and when they start the shoe's vibration will guide them through their route. For example, when we have to go left (right), the shoe on the left (right) leg will vibrate. This will solve their problem of stopping every time and checking the maps.

□ **HARDWARE IMAGE:-**



□ **TYPE OF PROJECT: - UDP**

**Prof. MANISHA PATEL**  
Internal Guide (I.C Dept.)

**Title: DENSITY METER**

**GROUPDETAIL:**

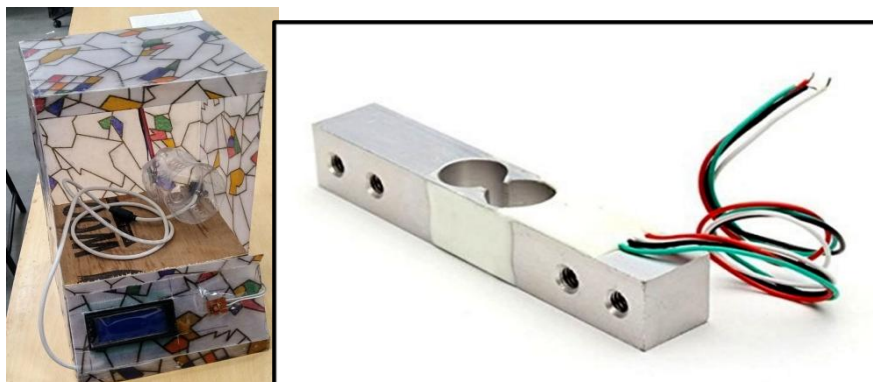
<b>Enroll No:</b>	<b>Name Of the student</b>
160280117016	Sanjay Jinjala
160280117017	JenishKalathiya
160280117033	Vishal Parmar
160280117064	Vivekjyoti Bhowmik

**NAME OF INTERNAL GUIDE:** Prof. Lalit S. Patel (I.CDept.)

**ABSTRACT:**

In most chemical, pharmaceutical and plastic plants and industries density measurement plays vital role in monitoring and controlling process parameters and our prototype is meant for that's only. The proejct is special one as it measures both solid & liquid densities in a single unified device. The market price of these existing products is costly However proposed project is very cost effective. In order to make it economical transducer (hx711), load cell as sensor, micro controller. Product is very portable as well as it having many features and use in multipurpose application like measurement of various liquid density as well as solids.

**HARDWARE AND SOFTWARE IMAGE:-**



**TYPE OF PROJECT: - UDP**

**PROF. LALIT S. PATEL**  
Internal Guide(I.C Dept.)

- **Title: Multi-Channel Temperature measurement and control using PID control**

- **GROUP DETAIL:**

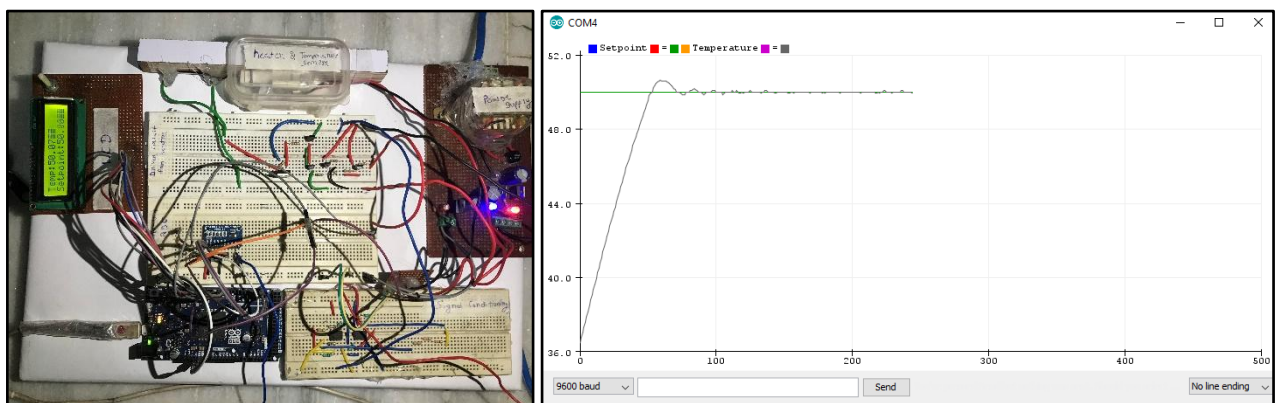
Enroll No:	Name Of the student
160280117060	Vaghasiya Meet Kiritbhai
140280117001	Ajudiya Nirav Bharatbhai
140280117005	BhaliyaJeiminVinubhai

- **NAME OF INTERNAL GUIDE:** Dr. RAKESH.C. Patel (I.C Dept.)

- **ABSTRACT:**

In almost all the process industries temperature measurement is necessary to maintain the quality of the product, so in this project we have made the temperature measurement system using PT1000 as a temperature sensor, and using micro controller to take the value of temperature at specific time and according to it taking the PID control action to control temperature of the system. In this project we have included the temperature measurement from different location using multi-channel input we can measure the temperature from different location simultaneously and take the control action accordingly as per requirement and PID control used for controlling temperature is made using microcontroller which will also continuously monitor the value of temperature from different location and LCD will display the value of temperature of different location turn by turn.

- **HARDWARE AND SOFTWARE IMAGE: -**



- **TYPE OF PROJECT: - UDP**

**Dr. RAKESH. C. Patel**  
Internal Guide (I.C Dept.)

- **Title: Robotic Assistant**

**GROUPDETAIL:**

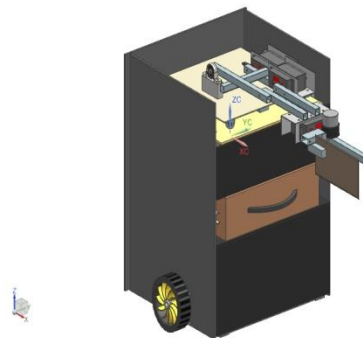
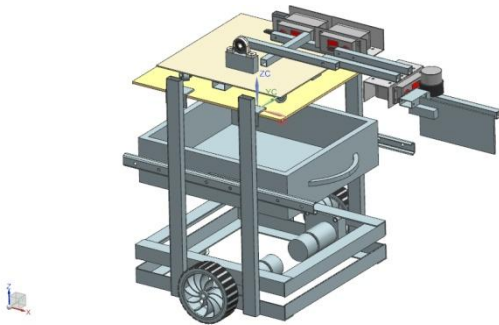
<b>Enroll No:</b>	<b>Name Of the student</b>
160280117034	Bhavik Patel
160280117043	Dhaval Pipaliya
160280117046	Dhruv Rathod

- NAME OF INTERNAL GUIDE:** Prof. VINOD .P. PATEL (I.CDept.)

**ABSTRACT:**

The most redundant and cumbersome task in any manufacturing industry is the frequent need of relocating and reorganizing resources. In most industries and organizations this task is done manually. So, write end to present system of robot(s) which does this task automatically for the users as and when they require. Once the robot gets the request from the user it queues the request in its buffer. The intended users are registered to the system database by the admin. The permitted user can log in to the application using his/her credentials. The user can make request to send or receive an object. The request can be made through the application interface provided. On receiving the request the robot uses its navigation mechanisms to receive the object from sender, and delivers it to the intended receiver. Additional security is provided by including biometric lock mechanism.

**HARDWARE IMAGE:-**



- TYPE OF PROJECT:** - UDP

**Prof. VINOD .P. PATEL**  
Internal Guide (I.C Dept.)

• **Title: Techocleaner**

• **GROUP DETAIL:**

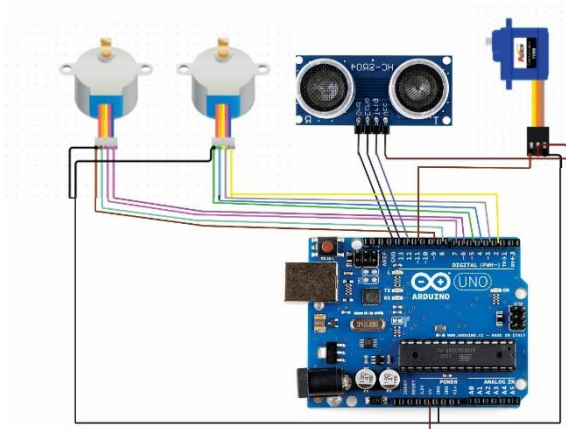
Enroll No.	Name of the Student
160280117026	Nayan Bhola
160280117027	NiharDhokai

• **NAME OF INTERNAL GUIDE:** Dr. ANKIT SHAH (I.C Dept.)

• **ABSTRACT:**

With the advancement of technology, robots are getting more attention of researches to make life of mankind comfortable. This projects presents the design, development and fabrication of prototype automatic floor cleaner. This robot operates autonomous mode with additional features like dirt container with air vacuum mechanism and pick and place mechanism. This work is very useful in improving life style of mankind.

• **HARDWARE AND SOFTWARE IMAGE: -**



• **TYPE OF PROJECT: - UDP**

**Dr. Ankit Shah**  
Internal Guide  
(I.C Dept.)

- **Title: Graphical User Interface (GUI) Development Using The WINCC For Cryoplant Termination Cold Box (CTCB)**

- **Group Details:**

Enrollment	Name
160280117025	PrithvirajManipuzha
160280117028	Shubham Palkhiwala

<b>Internal Guide:</b> Prof Lalit Patel	<b>External Guide:</b> Mr Anuj Garg, IPR,Gandhinagar
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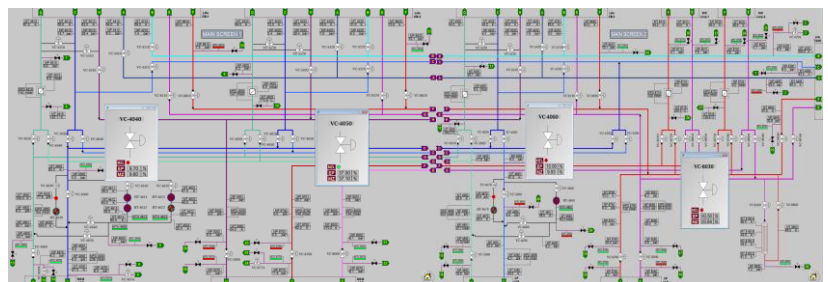
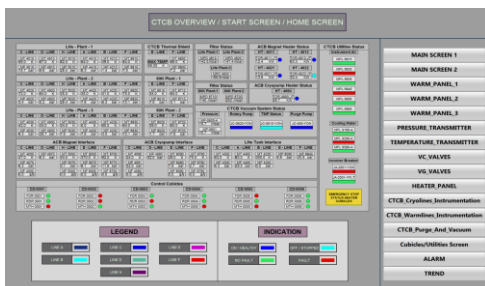
- **Abstract:**

ITER-INDIA Cryogenics group is committed to deliver the cryogenics distribution system for various clients i.e. Magnet, Cryopump and thermal shield of ITER at required process parameters. ITER Cryoplant, consists of mainly three liquid helium plants and two 80 K plants, is used to supply cryogenics power. The Cryoplant termination cold box (CTCB), part of ITER-INDIA deliverable, works as intermediate cold box between Cryoplant and clients with possibility of inter-connection of LHE plants and 80 K plants for magnet and Cryopump clients as per requirement.

PLC programming and GUI for CTCB have been already developed for level 1 (I/O objects), level 2(field objects), and level 3 (PID controller), using CODAC core system (mini-CODAC). PLC programming for level 4 (interlock logic) & level 5(sequence programming), is under development, will be used during the final cold test of CTCB. Before final cold test, instrumentations (i.e. control valves, pressure transmitter, flow transmitter, temperature transmitters, heater operation etc.) of CTCB have to be tested at room temperature for its functionality check.

Mini-CODAC is Linux based software package developed and distributed specifically for ITER project, includes EPICS (Experimental Physics and Industrial Control System), for Supervisory control and data acquisition (SCADA) development. A simplified GUI may be required to check the functionality of instrumentation of CTCB as Mini-CODAC level 4 & 5 programming may be in developing phase during CTCB test. WINCC, industrial proven SCADA software, based on windows operating system, is foreseen to be used as redundant system to Mini-CODAC if required. Therefore, another GUI can be developed in WINCC for redundancy purpose; will be useful to verify the functionality of instrumentation based on requirement.

- **Images:**



- **Project Type: IDP**

**PROF. LALIT S. PATEL**  
Internal Guide  
(I.C. Dept)



**Title: SMART WASTE WATER RECYCLING SYSTEM WITH RAIN WATER HARVESTING FOR DOMESTIC USE.**

**GROUP DETAIL:**

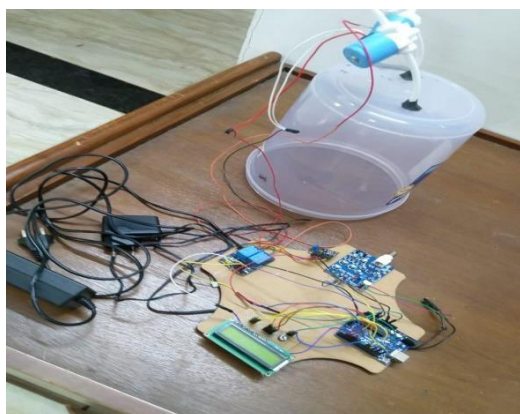
<b>Enroll No:</b>	<b>Name Of the student</b>
160280117013	Meghnil Kiritbhai Gamit
160280117007	Akash Manojbhai Chaudhari

**NAME OF INTERNAL GUIDE:** Prof. HARSH K. SHASTRI (I.C DEPT.)

**ABSTRACT:**

At the rate in which India population is increasing, it is said that India will surely replace china from its number 1 position of most densely populated country of the world after 20-30. these will lead to high rate of consumption of most valuable natural resource 'water' resulting in augmentation of pressures on the permitted freshwater resources. ancient method of damming river and transporting water to urban area has its own issues of eternal troubles of social and political. in order to conserve and meet our daily demand of water requirement, we need to think for alternative cost effective and relatively easier technological methods of conserving water. smart wastewater recycling and rain water harvesting system is one of the best methods fulfilling those requirements. To recycle waste water and rain water harvesting at domestic stage and purification of water for that purpose new approach with real time smart function has been proposed the waste water derived from human activities such as bath, laundry, dish washing, etc. is called domestic waste. and rainwater harvesting is the most common technique of rainwater harvesting for domestic consumption. in rural areas, this is most often done at small-scale. it is a simple, low-cost technique that requires minimum specific expertise or knowledge and offers many benefits.

**HARDWARE AND SOFTWARE IMAGE:**



**TYPE OF PROJECT:UDP**

**PROF. HARSH K. SHASTRI**  
Internal Guide (I.C Dept.)



### 3. Feedback

#### (A) Feedback from the faculty:

The online project review and presentation was something unique assignment for faculty as well as for students. These practices are generally not followed at graduations level. Overall the session was wonderful and most of all final year students, all faculties and external guide participated. Student explained technicality of their project and received suggestions from faculties and experts. Also their work was motivated and appreciated by panel. Best thing is, apart from project review and technical discussion students' communication skills augmented and such session will make student confident to face online interviews, meetings or video conferences in their professional life. Finally this session was a small fight against Covid 19. Our warrior-students proved that "virus lock downed their education institute but failed to lockdown their teaching-learning process."

From  
Harsh K. Shastri  
Assistant Professor

#### (B) Feedback from the students

- 1) First of all thank u very much to all faculty for their support. We all were worried about how our project will be analysed but online kaizen was a great idea. The support from the faculty was very good and the session was really superb and we have totally been able to display our project virtually. Again thank u very much to all faculty.

From: Chandan Lunia

- 2) We are glad to have successfully completed our final year project reviews through an online platform in such a pandemic situation being safe at home. We'd like to express our gratitude to all the faculties of Department of Instrumentation and Control Engineering to understand everyone's situations as well with their projects and allowed them to present it in any other way than hardware presentation. The process was smooth and the faculties during the review call also gave the groups great new ideas which they can add to their project and also motivated some teams to get a patent filed for their innovative work! We are thankful to our head of the department and our project guides for helping us throughout and staying in touch!

From: Khushboo Kapoor

#### **4. Best practice for evaluation of projects in Instrumentation & Control department**

##### **A) Internal Review for effective presentation:**

Instrumentation and control engineering department has organized two mid sem internal review for BE Final Year (8th Sem) projects. In which 1<sup>st</sup> review was conducted in the department and 2<sup>nd</sup> was done online. Students work progress and directions were rectified and suggestion for improvement were provided. This practices make students to be aware and confident for their final external presentation in University examination. This review also suggests the team ability to perform the project work so team members can synchronize with each other while presenting. The object of a project review is to help the team achieve the project goal and develop their soft skills.

##### **B) Outcome based evaluation for projects**

Department is having 5 Outcomes for project and best practices is followed by faculties for all the projects to cop up with Course Outcomes of project as below

##### **1. Student will able to apply integrating skills, software and hardware to develop prototypes**

To achieve this CO Students are timely meeting to internal Guide. Guide review direction and ensure continuous progress of project.

##### **2. Student will able to interpret data from prototype which leads to valuable conclusion / solution of project definition**

Again this CO was initially reviewed by guide, later on 2 to 3 departmental level events were organised in which senior faculties as well as experts from industry or stake holders are invited to review students work and provide suggestions

##### **3. Student will able to demonstrate prototype to professionals and incorporate feedback in the final project model**

To achieve above CO online Kizen event was organised dated 09/04/2020 in which student demonstrated their work in online to panel of experts

##### **4. Student will able to Prepare technical documentation and explore the opportunities for publications as well presentation**

- Time to time all project related data is to be uploaded on GTU's project PMMS portal by students. Uploaded data review by the internal guide which either sent back to student for correction or submit on portal. This activity is timely completed as per academic schedules of University
- Apart from university protocol students have to Submit hard bound Project report to department signed by internal / external guide and Head of Department which kept in departmental library
- A Paper is prepared on the project and submitted on Google Classroom. After reviewing paper students are encourage find possibility to publish in reputed journals
- Some of innovative projects are motivated for patenting and with funding under SSIP scheme

**5. Student utilize knowledge and acquire skills like collaborations, communication and independent learning for betterment of mankind**

- Some of projects are developed in the collaboration of students of other department
- Students soft skills are sharpen with various demonstration and presentation. IC department ensure that each team demonstrate their work in public domain at least 2-3 times in semester which helps to remove their stage fear and enhance communication skills.
- Various tools like PPT, animation, simulation, video meetings etc were asked to employ for presentation.

**C ) Evaluation based on outcome rubrics**

**Department has formed a rubrics for evaluation of projects, every students explained this rubrics before the starting of the projects.**

A dedicated session was conducted before 1<sup>st</sup> review in the department’s “RavindranathTagor seminar hall” by HOD and faculty members. In this session students were explain outcomes and rubrics of project also discuss various key points for project

**RUBRIC:**

	<b>Parameter</b>	<b>Outstanding (up to 100%)</b>	<b>Accomplished (up to 75%)</b>	<b>Developing (up to 50%)</b>	<b>Beginner (up to 25%)</b>
1	Prototype development	Working hardware, software and integrating skills demonstrated	Working software, hardware demonstrated but lack of integrating skills	Working hardware OR software demonstrated	non working prototype demonstrated
2	Prototype result and project definition justification	Fully Justified	Major part of definition justified	Justified at some extent	few part justified
3	Exhibits prototype in college event / review / experts' and incorporate feedback	excellent communication, exhibition skills and able to face queries and critics	Good communication and explanation and able to face some of queries and critics	Good communication/ explanation but unable to face queries	Communication/ explanation is up to the marks
4	Technical documentation and publications and presentation	1 . Project report submitted 2. Based on project Patent filled OR Paper Publication OR Project participated in other colleges / University techfest/	1 . Project report submitted Project participated in other colleges / University techfest/ hackathon etc. 2.Project participated national level (	1. Project report submitted 2.Project participated in State/local level event (other colleges / University techfest/ hackathon etc.)	1. Project report submitted

		hackathon etc.	colleges / University techfest/ hackathon etc.)		
5	Professional development	1. Best procedure and safety measures followed by team 2. Regular reporting to Guide and Timely update task on University PMMS Portal	1. Good procedure and safety measures followed 2. reporting to Guide and task on University PMMS Portal not done as per schedules	1. Good procedure and some safety measures followed 2. Regularity is up to the marks	1. safety measures ignored 2. Regularity is up to the marks

**D) Encouragement of publication as well SSIP funding.**

In house session for preparation of poster and paper were organized. A poster is prepared for each project which submitted in the Google Classroom. Some of good posters are framed and placed on the wall of department.

Each group has to prepare poster as well as technical paper. Some of the innovative projects encourage for patenting and funding for SSIP.