



Government of India
Ministry of Science & Technology
Department of Science & Technology
National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)
Technology Bhawan, New Mehrauli Road, New Delhi -110016, INDIA
(Confidential, only for NM-ICPS use)

Hub Review Report

Type of Review: Annual / Quarterly Visit: First Visit

****Two hardcopies of the DPR to be provided to the Mission Office Team at the time of review.**

Name of the Hub: IIT Guwahati Technology Innovation and Development Foundation.

Host Institute: IIT Guwahati, Assam.

Technology Vertical Area: Technologies for Underwater Explorations.

1. TIH Management:

Project Director (TIH) and Date of Appointment: Prof. S. K. Dwivedy, Date: 6th October 2020

CEO (TIH) and Date of Appointment: Mr. Chandra H. T. Date: 30/04/2022

Director (HI): Prof. T. G. Sitharam

HGB Composition:

Chairperson: Prof. T. G. Sitharam, Director, IIT Guwahati

Vice Chairman: Prof. G. Krishnamoorthy, Dean II&SI, IIT Guwahati

Academic Institute (IIT Guwahati): Prof. Gopal Das, Head Dept. of Chemistry,

Academic Institute (IIT Guwahati): Prof. Udaya Kumar Dharmalingam, Head Dept. of Design,

Academic Institute (Outside IIT Guwahati): Prof. Bibhuti Bhusan Biswal, Director NIT Meghalaya,

Academic Institute (Outside IIT Guwahati): Prof. Sriparna Bhuyan Baruah, Head Centre for Industrial Extension, Indian Institute of Entrepreneurship

Members from Industry: Mr. Ashwin Mahesh, Founder, CEO Mapunity, Bengaluru

Members from Industry: Mr. Rudrapatnam Sreenivasa Iyengar Rajkumar, Senior General Manager at Bosch, Bengaluru, Karnataka, India

Project Director: Prof. S. K. Dwivedy, IIT Guwahati

Members from DST: Mission Director NMICPS: Dr. Ekta Kapoor (Previously Dr. K R Murali Mohan)

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Number and Date of HGB Meetings Held: 1 ON 24th May 2021**BoD Composition:****Chairperson:** Prof. T. G. Sitharam, Director, IIT Guwahati**Vice Chairman:** Prof. G. Krishnamoorthy, Dean II&SI, IIT Guwahati**Academic Institute (IIT Guwahati):** Prof. Sharad Gokhale, Dept. of Civil Engg.,**Academic Institute (IIT Guwahati):****Academic Institute (Outside IIT Guwahati):** Prof. Bibhuti Bhusan Biswal, Director NIT Meghalaya,**Academic Institute (Outside IIT Guwahati):** Prof. Sriparna Bhuyan Baruah, Head Centre for Industrial Extension, Indian Institute of Entrepreneurship**Members from Industry:** Mr. Ashwin Mahesh, Founder, CEO Mapunity, Bengaluru**Members from Industry:** Mr. Rudrapatnam Sreenivasa Iyengar Rajkumar, Senior General Manager at Bosch, Bengaluru, Karnataka, India**Number and Date of BoD Meetings Held: 10,**

| Board Meetings No. | Date |
|--------------------|---------------------------------|
| 1 st | 6 th October 2020 |
| 2 nd | 15 th December 2020 |
| 3 rd | 30 th April 2021 |
| 4 th | 15 th July 2021 |
| 5 th | 19 th November 2021 |
| 6 th | 6 th December 2021 |
| 7 th | 28 th February 2022 |
| 8 th | 27 th June 2022 |
| 9 th | 22 nd September 2022 |
| 10 th | 24 th September 2022 |

Total Space to be allotted (per Sq. Ft.) mentioned in the DPR:
3000 Sq. meter~ 32000 Sq. Ft**Total Space allotted till date:**4th Floor R&D Building: 1500 m².5th Floor R&D Building: 1200 m².Central Workshop: 300 m².**Signing Date of Tripartite Agreement:** 30th December 2020**Date of Registration of Section 8 Company:** 04 September 2020**Website and Social Media Handles (Links to be provided):** <https://iitg.ac.in/tihue/>,
<https://iitgtidf.com/>**Whether Registered Darpan Portal or Not: (if Yes, mention the Darpan ID):** No**Objectives/Goal of the TIH:**

The Aim of this hub is “Indigenous design and development of Mechanical Structures, Prime Movers, Sensors, Controllers, Software, and Communication systems, for underwater application. IIT Guwahati will provide a platform for bringing the experts together for generation of the knowledge through basic and applied research which can lead to generate several entrepreneurs, start-up companies, skill developments, jobs, and research opportunities in this area.”

Grand Challenges/Focus Area:

1. Underwater Repairing and Maintenance

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2. Design and Development of Underwater Vehicles
3. Underwater Vision System
4. Underwater Communication System

Overall Achieved Targets in percentage (%): 90% (First Year)

1. Action Points:

| Areas | Complete (Yes/No) | Target Date (by which action to be Completed) | Challenges, if any |
|----------------|-------------------|---|--------------------|
| SIRO | No | 31/12 /2022 | |
| Income Tax | Yes | | |
| GST Exemptions | No | Not required as per recent Govt. guidelines | |
| CSR Funds | No | 31/12 /2022 | |
| FCRA | No | 31/12 /2022 | |

2. Technical Achievements:

| YEAR | Technology Development | | Entrepreneurship Development | | HR Development | | International Collaborations | | Total Targets (for 5 years) | Total Achievements | Challenges and / or remarks if achievements are lower than targets set | Technology Development |
|----------------------|------------------------|----|------------------------------|-----|----------------|-----|------------------------------|---|-----------------------------|--------------------|--|------------------------|
| | T | A | T | A | T | A | T | A | | | | |
| 1 st Year | 6 | 10 | 16 | 108 | 54 | 133 | 0 | 1 | 77 | | More than the targets have been achieved | Annex I (A1) |
| 2 nd Year | 9 | 9 | 29 | | 231 | 146 | 1 | 1 | 270 | | Second year is continuing | |
| 3 rd Year | 10 | | 29 | | 147 | | 1 | | 187 | | | |

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3. Target Achievements Details:

i) Technology Development

| Year | No. of Total Projects | No. of Total Patents | No. of Total Publications | No. of Other IPs | No. of Technologies Licensed | List (Names) of Technology Products developed | Increase in CPS Research Base | Any Specific Initiatives (mention details) |
|----------------------------|-----------------------|----------------------|---------------------------|------------------|------------------------------|---|-------------------------------|--|
| 1st Year | Annex I (A1) | Annex I (B1) | Annex I (C1) | Annex I (D1) | | Annex I (A1) | Annex I (A11) | |
| 2nd Year | Annex I (A2) | Annex I (B2) | Annex I (C2) | Annex I (D2) | | | | |
| 3rd Year | Annex I (A3) | Annex I (B3) | Annex I (C3) | Annex I (D3) | | | | |

N.B.: Detailed comments should be enclosed in the **Annex's** mentioned above.

ii) Human Resource Development

| Year | No. of Fellowship Granted | No. and details of Chair Professors | Skill Development | Any Specific Initiatives (mentioned in detail) |
|----------------------------|---------------------------|-------------------------------------|-------------------|--|
| 1st Year | Annex II (A1) | Annex II (B1) | Annex II (C1) | Annex II (D1) |
| 2nd Year | Annex II (A2) | Annex II (B2) | Annex II (C2) | Annex II (D2) |
| 3rd Year | Annex II (A3) | Annex II (B3) | Annex II (C3) | Annex II (D3) |

N.B.: Detailed comments should be enclosed in the **Annex's** mentioned above.

iii) Entrepreneurship Development

| Year | TBI Established | | No. of Start-ups | | Numbers achieved | | | | | No. of Jobs created | No. of Technology Parks, CoEs, other Support/ Infrastructure Established | Any Specific Initiatives (mentioned in details) |
|----------------------|-----------------|---------|---------------------|----------------|------------------|----------------|----------------|----------------|----------------|---------------------|--|---|
| | Existing | Created | National | International | GCC | PRAYAS | EIR | DIAL | CPS-SSS | | | |
| 1 st Year | 1 | | Annex III (A1) 3 | Annex III (B1) | Annex III (C1) | Annex III (D1) | Annex III (E1) | Annex III (F1) | Annex III (G1) | Annex III (H1) | Annex III (I1) | |
| 2 nd Year | 1 | | Annex III (A2) 2 | Annex III (B2) | Annex III (C2) | Annex III (D2) | Annex III (E2) | Annex III (F2) | Annex III (G2) | Annex III (H2) | Annex III (I2) | |
| 3 rd Year | | | Annex III (A3) | Annex III (B3) | Annex III (C3) | Annex III (D3) | Annex III (E3) | Annex III (F3) | Annex III (G3) | Annex III (H3) | Annex III (I3) | |

iv) International Collaborations:

| International Collaboration | | | | | |
|---|------|---------|-------|-----|---|
| Name of the Institutions | Area | Funding | Start | End | Remark |
| Korea Advanced Institute of Science & Technology (KAIST), Daejeon | UWC | - | - | - | Interactions started with the visit Ms. YJ Park, Email Attached |
| | | | | | |

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4. Project Achievement Details:

| Year | Projects undertaken with | | | |
|----------------------------|---|----------------------|---------------|---------------|
| | Academic Institutions | Business Enterprises | NGOs | Others |
| 1st Year | Annex IV (A1) Same as ANNEXURE I (A1) | Annex IV (B1) | Annex IV (C1) | Annex IV (D1) |
| 2nd Year | Annex IV (A2) Same as ANNEXURE I (A2) | Annex IV (B2) | Annex IV (C2) | Annex IV (D2) |
| 3rd Year | Annex IV (A3) | Annex IV (B3) | Annex IV (C3) | Annex IV (D3) |

5. Resource of TIH:

| Resources of TIH | | | | | |
|------------------|------------------------------|--------------|---------------|----------------|---|
| Types of Funds | Name/Sanctioned order detail | Year I (Rs.) | Year II (Rs.) | Year III (Rs.) | Remark |
| DST Grant | Recurring | 18.25 cr | | | BOD readjust the amount as 9 cr for non-recurring and 11.25 cr as recurring. As per tripartite document, in the 1 st year, Recurring 12.25 cr and non-recurring 8 cr. |
| | Non-Recurring | 2.00 cr | | | |
| | Total | 20.25 cr | | | |
| Private Sector | | | | | Started a project on developing automated fish monitoring system in fish wells and IOT based automated transportation of live fish for Aqua Blue Global Solutions |
| | | | | | IOT based attendance monitoring system. Given to nearby schools. GNRC hospital shown interest to |

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| | | | | | |
|------------------|--|--|---------------------------------------|--|---|
| | | | | | procure for its 6000 staff members. |
| | | | | | |
| State Government | | | | | Conducted joint workshop with IWT Assam and Engineers from State Govt. of Meghalaya. |
| | | | | | Involved in the Kulsi river Dolphin conservation project and Digholi beel lake restoration project. State Govt. providing logistic help only. |
| | | | | | |
| International | | | | | |
| | | | | | |
| | | | | | |
| Other (Specify) | | | | | |
| | | | | | |
| | | | 23 Lakhs | | Design and Development of Automated Hydroponics and Greenhouse Temperature Controller System Installed at CSIR-NBRI, |
| | | | Rs 24282/- Rs 2995/- Rs 1844/ - | | Provided (i) multi-purpose charging unit, (ii) 3D printed items for gun mount and (iii) Step down voltage converter box to Indian Army |
| | | | | | Hand over 3D printed Sentry post to Indian Army (7 engineer regiment) on 6 th October 2022. |
| | | | | | Registration fee from the STC/ Workshop |
| | | | | | User groups of GPU System |
| | | | | | Portable water quality monitoring system |
| | | | | | Product and services of Developed ROV |

| | | | | | |
|--|--|--|--|--|---|
| | | | | | Training in the product development, Fabrication Lab and other Labs of the COE. |
|--|--|--|--|--|---|

6. Expenditure Details / Fund Utilization by TIH

| Year | Fund released from DST | Total Expenditure till now | | Current Balance | Details of Interest Deposited in Bharatkosh | | | Percentage (%) of Expenditure till date | Committed Expenditure | Submitted UC/SE (mention date) |
|----------------------|------------------------|----------------------------|----------|--|---|---------------------------------|----------------|---|-----------------------|--------------------------------|
| | | Reported | Accepted | | Date | Amount | BK Receipt | | | |
| 1 st Year | 20.25 | Rs 12,65,24,166 | | Rs 3,59,75,834.19 4.0 Cr already recommended for the 2 nd year Project | 3-02-2022 22-04-2022 | Rs 3,30,521 Rs 42,25,913 | Yes Yes | 82.27% 100% for Non Recurring | Rs 1,19,81,720.00 | Yes |
| 2 nd Year | 0 | | | | | | | | | |
| 3 rd Year | 0 | | | | | | | | | |

7. Challenges and Future Plans:

| Challenges and Future Plans | Specific Program/Problems/Action Taken | Remarks (What kind of support is needed from DST) |
|---|--|---|
| Technical, administrative & financial challenges as a TIH you were facing. | | |
| Are there developed mechanisms for the industry to approach academia? Do Industries approach academia for their local problems? | Yes, Training Schools, and COE are Major Source of Collaboration | |
| What percentage of the external funding is from industry? | Currently in process | |
| Problem statements of line ministries and action taken on the same, progress of projects linked to such problem statements | NIOT (Corel and Metal Structure), DRDO (Golf and Wetland Monitoring), IRS (Certification for Underwater Activities), IWT & IWAI (Night Vision System, Standardization of country boats, Dolphin Monitoring) | |
| What are the specific gaps in forming a strong Industry-academia connection? | The infrastructure, which we are currently developing | |
| Number of PPP projects undertaken in past 3 years (Please provide relevant examples, sector-wise) and the role of TIHs in facilitating PPPs | An Indigenously Developed, Automated Hydroponics and Greenhouse Temperature Controller System has been Installed at CSIR-NBRI. | |
| Engagement with foreign institutes/entities (public and private) | MOU has been signed with TORI (Taiwan Ocean Research Institute) | |
| What are the Inter-institutional linkages (including linkages with other NMICPS Hubs) and Intra-institutional linkages? State clearly the work with input and output measurements | TIH – IITG has Collaborated with 10 other IITs and 6 NITs and 2 State universities, 6 Public sector companies. Planning to Collaborate with TIH – IITD on Robotics and TIH – IITB on UW pipe monitoring systems. Also, TIH – IIT Roper for Agriculture (Aquaculture), TIH-IIT Dhanbad for UW mining | |
| Linkage with indigenous communities/ traditional knowledge resource persons/NGOs | Developing Several Technologies for Finishing Community and other triable communities of Assam. Visited Kulsi river for dolphin restoration and monitoring and establishing a CPS research base in the nearby area and company Aqua Blue Global Solutions. | |
| Science communication and public engagement | The underwater diving & drone schools will be major source of public engagement in future. Many students from nearby schools and colleges visited our labs. Some skill | |

| | | |
|--|--|--|
| | development programs for social entrepreneurship has also taken up. | |
|--|--|--|

8. Open Discussion:

Share any success stories within 1000 words (not more than 3 stories) along with photos and videos.

Approvals:

1. Design, development and field testing of underwater remotely operated vehicle (UWROV)

To cater the demand of underwater explorations and monitoring from the academia, research institutes and industries a much-needed low cost underwater remotely operated vehicle (UWROV) has been successfully developed. The UWROV (Fig.1(a)) is tested several times in lakes (Fig.1(b, c, d)), the Brahmaputra river (Fig.1(e)), Teesta river (Fig.1(f)), and other water bodies according to the various project requirements, viz., Defence Terrain Research Laboratory (DTRL) funded project “Risk assessment of floating debris dominated flash floods in trans-boundary upper Himalayan catchments” and National Mission on Himalayan Studies (NMHS) funded project. The UWROV is equipped with various sensors such as temperature, pressure, camera with tilt capability, inertial measuring unit and Sonar. The UWROV is designed and fabricated by considering an open frame structural model which is compact and affordable. Individuals, Gov. bodies and Industries may find this open frame based UWROV, to be a highly valuable resource for underwater explorations. The UWROV has some key elements such as neutral buoyancy, customizable design by the use of PVC pipes, additional spaces for mounting various sensors and hull according to the requirement.

The operation of the UWROV involves remote communication with the on-board computer at the surface through the tether LAN cable and with the QGround control software interface. Through the LAN cable the live telemetry data, live underwater footage and videos, recorded from the various sensors and camera are displayed and stored in the software interface. The single-board computer Raspberry Pi is used to manage all the electronics components. Open-Source companion computer platform in the Raspberry-pi helps collect the sensor data and live underwater footage and transmit to the computer at other end and interpret and communicate the received control signal to the pixhawk controller for thruster operation. Pixhawk controller, connected to the raspberry pi, acts as the brain of the rover and controls the robot motion. Pixhawk has an open-source software “ArduSub,” which is capable of remotely or autonomous underwater vehicle operations such as manual, stability and depth hold control, obstacle avoidance by sonar, and trajectory tracking with an acoustic positioning system. The thrusters and sensors are connected to the Pixhawk. The computer in the control station uses an open-source software QGround Control.

In this model of UWROV four thrusters i.e, two horizontal and two verticals are used. The thrusters provide required motions to the UWROV such as heave, sway, surge, yaw and roll. These thrusters can be easily controlled by individual ESC. The open frame-based structure is not only simple to construct but also provides ample space for payload placements. All the electronic components are placed inside a water-sealed hull and only the LED

and sonar are placed outside the hull. The battery is placed outside the hull and the charging port is available outside the hull body.

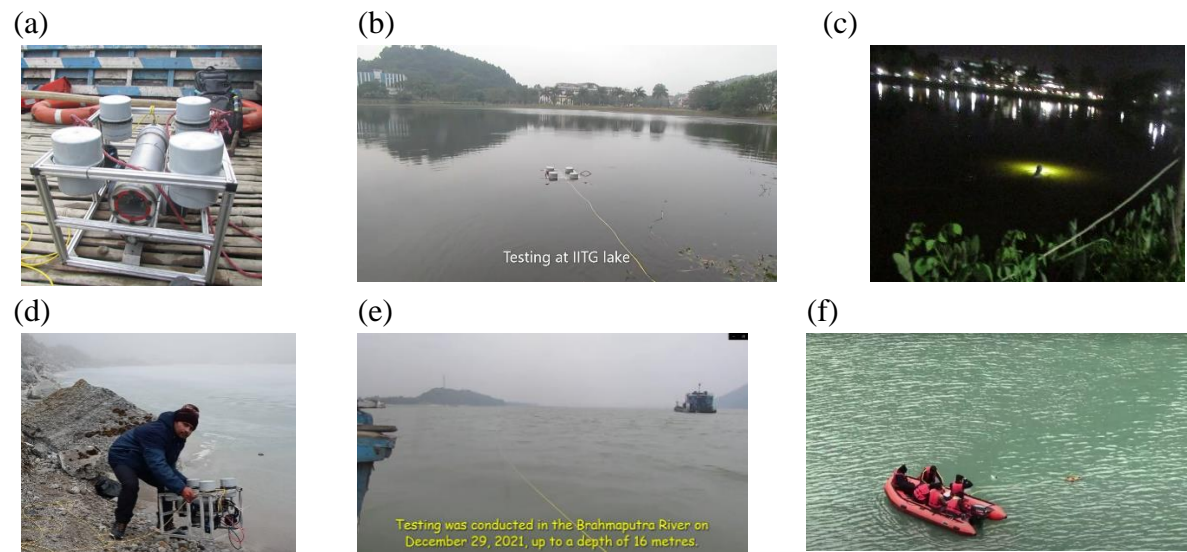
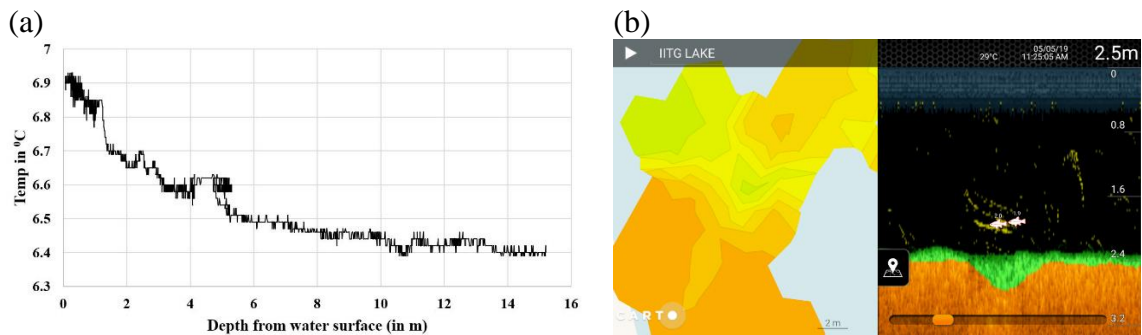


Fig. 1: (a) the UWROV physical model, field test at (b, c) IIT Guwahati lake in day and night (d) Rathong lake, west Sikkim (e) the Brahmaputra river and (f) Teesta river.

The UWROV was tested under the water in a nearby lake inside the IIT Guwahati campus and an onboard camera has detected some fish colonies which are shown in Fig. 2. The temperature variation with depth in the Teesta river is shown in Fig. 3(a). Also, Sonar footage and bathymetry studies of IIT Guwahati lake and Teesta river are shown in Fig. 3(b-e), where one can observe the fish colony and river and lake bed.



Fig. 2 The captured image of the fishes at 0.2 m depth showing the range of visibility.



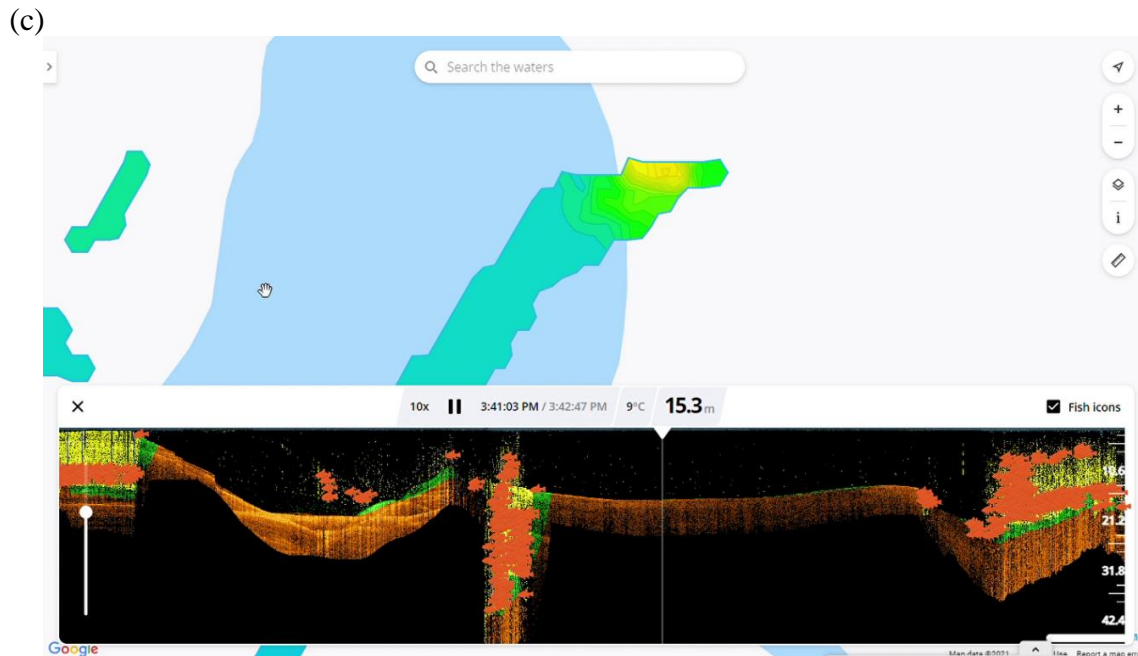


Fig. 3: (a) temperature variation with depth in the Teesta river, Bathymetry studies through sonar sensor (b) IIT Guwahati lake, (c) Teesta river.

The developed UWROV is successfully tested in various water bodies up to a depth of 20 meter under 2.5- 4 m/sec water flow velocity collecting critical parameters such as pressure variations, temperature variations, live underwater footage and videos, GPS and sonar sensors for the bathymetry studies. The UWROV is ready for collaborative work with various Govt. bodies, private entities to carry out online monitoring of various water bodies such as dams, bridges, beels, fisheries, optical and ultrasonic sensor-based health monitoring of underwater structures and ships.

Name of Reviewer:

Signature with date:

2. IITG TiDF Project on Automated Hydroponics and Greenhouse Temperature Controller System Installed at CSIR-NBRI

IIT Guwahati TiDF has successfully executed the project on automated Hydroponics System and Climate Controller inside the Greenhouse at CSIR-NBRI premises given as a purchase order through E-Tender on 10/04/2022. (PO – 8-43-21-P)

About: -

The GOI has launched CSIR Floriculture Mission ref:

<https://pib.gov.in/PressReleasePage.aspx?PRID=1702516#:~:text=The%20mission%20will%20focus%20on,M,arigold%2C%20Rose%2C%20Tubero%20etc.>

In reference to that CSIR-NBRI has awarded the project to IIT Guwahati TiDF to develop the Fully Automated Greenhouse of 100 sq. meter having advanced technologies to grow and maintain the flowers in a hydroponics Dutch bucket system with a minimal human interaction.

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Problem Statement: -

A World Bank study shows that globally, 70 percent of water usage goes towards agricultural production. It is projected that by 2050, 593 million hectares of land will need to be transformed into agricultural land to meet the growing needs of the global population.

Project Highlights: -

The system installed at CSIR-NBRI uses the hydroponics Technique to grow the on and off-season flowering in a Dutch Bucket System concept. To reduce the human interruption and to get the accurate data for the scientific and research purposes the following advancement has been made in the traditional system.

1) Nutrition dosing & water irrigation automation

Growing Plants in a Hydroponics Environment can save up to 90-95% of the water requirements needed for the plants. However due to not presence of the soil a very careful measurements of the accurate EC and PH values of the flowing water is required to be maintained. For this the system developed by the IITG TiDF not only measures the real time EC and PH values and the changes but also dose the required amount of the nutrients as and when needed by the plants. This has helped us to achieve 8-9 times faster growth of the plants and saves up to 50% of the nutrition required in comparison to the manually adjusted the macro and micro nutrition. Along with that the dozer also adjust the PH level in the solution automatically.

2) Temperature Controller: -

The maintenance of the temperature is a must need for the off-season flowering and also for growing flowers in an artificial environment. The temperature in the summers inside the greenhouse rises up to 45 degrees Celsius. To solve this challenge we have used Foggers, Fan & Pad System, Exhaust Fans, Air Circulation fans inside the greenhouse which reduces and maintain the temperature from 24-28 degrees Celsius in the operating area. To achieve the reduction in the temperature we have developed our propriety algorithms to automatically run the equipment's as per the need and based on the feedback of the temperature and humidity sensors. This not only saves the electricity consumption but also saves the 24X7 human monitoring inside the greenhouses.

3) Customized Lights Requirements: -

For a faster growth of the plants different lightning conditions are required. For that we have installed lights ranging from 400-900nm in red, blue, green, warm white and glooming yellow colors based on the different needs of the flowers. The lights run on a timed algorithm which can be adjusted based on the different weather conditions and flowers requirements. This helps to grow plants in off-season times and saves a lot of electricity consumptions.

4) Cloud Monitoring: -

The device provides the all gathered data online in real time for cloud monitoring with alerts and progress to take the instant action. The dashboard developed do the required analysis of the historical data through charts and graphs and make the comparisons of different plants need.

5) Filtration Unit: -

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The water supply is governed by the filtration units comprised of the Hydro cyclone, Sand and Disk Filters. The water then goes through the fully automatic RO unit in different tanks of foggers, pad, and solution.

Future Scope: -

- 1) Job creation by providing hydroponics training to general public and farmers
- 2) Research findings on real time generated data gathered from the device.

Name of Reviewer:

Signature with date:

3. IoT based Systems

3.1 Flood Monitoring System

Introduction

Flood is one of the major well-known Natural Disasters. When water level suddenly rises in dams, river beds, city etc. A lot of Destruction happens at surrounding places. It causes a huge amount of loss to our environment and living beings as well. So, in these cases, it is very important to get emergency alerts of the water level situation in different conditions in the river bed, lake, wetland, smart city, ponds etc.



Assam



Bangalore



Agriculture

System overview

The purpose of this device is to sense the water level in river beds and check if they are in normal condition. If they reach beyond the limit, it alerts people through internet and mobile alerts when the water level reaches beyond the limit. This device is based on an IoT Sensor Network. It is able to detect the water level every 30 second interval and rapid changes of the water present in the lake, rivers, wetlands, and ponds so that wide-area monitoring is possible.

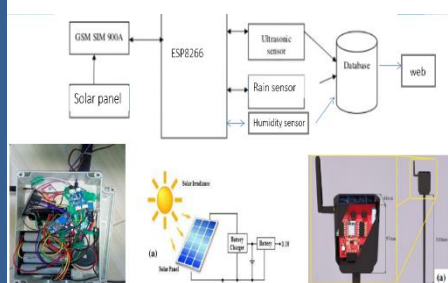
Benefits –

- ✓ Early flood and weather prediction/forecasting
- ✓ Disaster management, water monitoring,
- ✓ Smart city, irrigation, and optimal use of water resources where their availability is low or high.



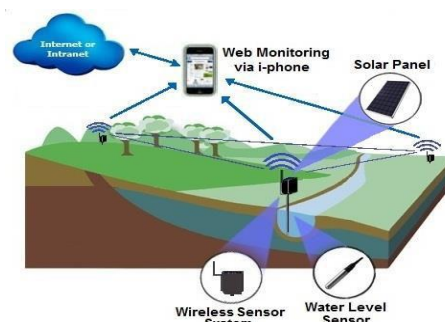
Architecture and Operation

This system is using modern “Internet of Things” (IoT) technologies today available, detects information about presence and real-time availability of water resources in the area where WSN-based monitoring system is installed and sends the detected data, also relative to environmental parameters, to the nearby tablets and smartphones that uses developed application. By means of a tablet or smartphone, moreover it’s possible to share information read from each sensor with all users who use the same website, through peer to peer Wi-Fi connection or any other Internet connection.



Schematic diagram

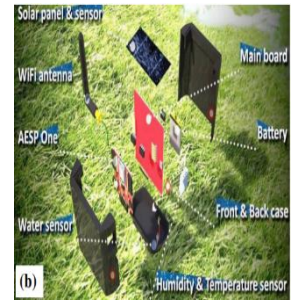
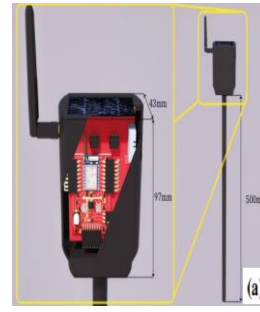
In this system Ultrasonic sensor to sense the water levels and Rain sensor will see the condition of rain and Humidity sensor measure weather condition. ESP8266 to process these data. The data will be uploaded to IoT cloud, then we can monitor from anywhere in the world.



Technical specification and Design:

Specifications:

- Connectivity: Wi-Fi or 2G/3G SIM
- Power: solar or 5v ,2A DC Supply
- Battery:8000mah Lithium Ion
- Temperature: 0-50°C / $\pm 2^{\circ}\text{C}$
- Humidity: 20-80% / 5%
- Pressure: 300 to 1100 hPa

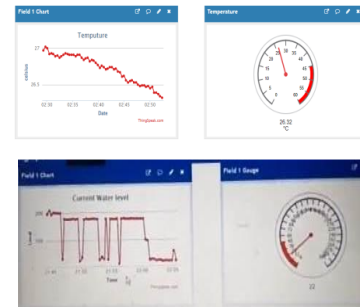


Fabrication



Testing in Lab Scale:

The developed flood monitoring and early warning system that utilizes ultrasonic sensor to detect water level, humidity, temperature, atm. pressure functions perfectly according to the specification. It successfully passed several tests based on the different parameters. As you can see the result in the below in website-based data.



Installation and outdoor weather testing:

After successful testing at the lab level, this device was tested various location we installed for a long time in the Brahmaputra River and besides in IITG various lake it was also successfully installed.



3.2 Underwater Optical Wireless Communication Device

Underwater communication between divers when they dive with a half-face mask (holding a diving regulator in their mouth) is mostly non-verbal using dive slates or hand gestures. Some high-cost equipment, such as underwater wireless transceivers (acoustics), is used for verbal communication between divers when they dive with a full-face mask (attached with a diving regulator).



Diver using dive slate



Diver using hand gestures



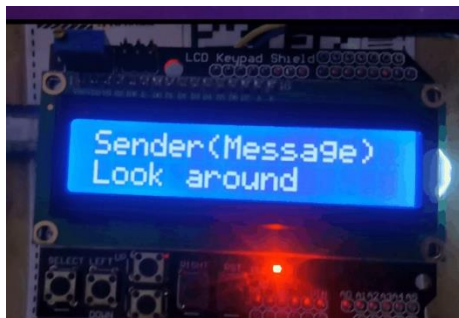
Diver using acoustic

We have been tasked with developing cost-efficient alternatives for both verbal and non-verbal communication for divers based on underwater optical wireless communication.

For divers with half masks (holding a diving regulator in their mouth), we developed a wearable device that transmits short preassigned messages by the click of a button using an on–off keying (OOK) form of modulation that represents digital data as the presence or absence of a light. The device has a transmitting unit which converts the text into bit sequences and encodes it into the light source. The receiving unit has a photo-sensitive panel (solar panel), which receives the light, which is decoded and the message is displayed.

The major challenges we faced during the development were ambient light interference, distortion, line of sight etc. Some of the techniques we adapted to overcome the abovementioned challenges are:

To eliminate ambient light interference, we added an additional photo-sensitive panel to gather the ambient light value and make it the threshold value. We adapted a non-directed line of sight (diffuse) technique to overcome the connection loss due to obstacles.



Transmitter sending message



Actual transmission of message as light pulse



Receiving the message

Future Work:

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For divers with full mask (attached with diving regulator), To develop a device for verbal communication using Intensity modulation technique. The device has transmitter which uses a microphone which is connected with modulator board to generate light wave with varying intensity according to the audio picked up by the microphone. In the receiver has photo-sensitive panel receives the signal and based on the intensity of light output audio is delivered.



Working model for verbal communication device based on the Intensity Modulation

PROJECTS DETAILS YEAR I

| Project Detail Year I | | | | | | |
|--|------|-------------|-------------------|-----------------|--------------------|---|
| Name | Area | Project No. | Start (dd/mm//yy) | End (dd/mm//yy) | Ongoing/ Completed | Result |
| Project-1: Underwater Manufacturing, Repairing and Maintenance | | | | | | |
| 1. Design and Development of Apparatus for Underwater Repairing and Maintenance of Metallic & Non-metallic Structures | | | | | Ongoing | |
| 2. Design and development of novel, cost-effective and integrated robot-laser-based drilling technologies for under water material processing | | | | | Ongoing | |
| 3. Design and in-house fabrication of an underwater compressed air storage system | | | | | Ongoing | |
| 4. Experimental Investigations into the effect of reinforcement particles on the tribological and corrosion properties of marine grade AA5052 aluminium alloy joints through FSW and Development of suitable attachments | | | | | Ongoing | |
| 5. Vibration Analysis of Underwater Pipe Line | | | | | Ongoing | |
| 6. Short duration underwater measurement diagnostics of saline water behavior through shockwave impingement | | | | | Ongoing | |
| Project-2: The design and development of remotely operated underwater vehicles | | | | | | |
| 1. Design and development of underwater technologies for defence applications | | | | | Ongoing | |
| 2. Ergonomic Evaluation of the Human-Robot Control Interface and Suggestions for Improvement of Usability | | | | | Ongoing | |
| 3. Development of Unmanned Underwater Vehicle for monitoring of underwater eco system and weed management | | | | | Ongoing | |
| 4. Development of flexible multi-link spatial manipulator mounted on a moving body for underwater exploration | | | | | Ongoing | |
| 5. Analysis and development of computational intelligence based navigational strategies for an underwater robotic vehicle | | | | | Ongoing | |
| 6. Design and Development of In-pipe robot | | | | | Ongoing | |
| 7. Development and Analysis of Intelligent Integrated Water Born Robot for Surveillance, Monitoring and Cleaning | | | | | Ongoing | |
| 8. Smart Pond Monitoring System for Aquaculture Farming & Wetland monitoring System, Flood monitoring System | | | | | Ongoing | |
| 9. Design & Development of an AUV for Pisciculture and ROV for Water Quality Assessment and Bathymetry Analysis | | | | | Ongoing | CAD Model developed and CFD analysis is carried out to find the drag forces |
| 10. Unmanned Exploration of underwater ecological system both in fresh and sea water | | | | | Ongoing | |

| | | |
|--|---------|--|
| 11. Design, Analysis and Development of a Low-Cost Underwater Vehicle (Mini Submarine) for Tourism Purpose & Sustainable Tourism | Ongoing | |
| 12. Intelligent Underwater Robot for Target Detection | Ongoing | |
| Project-3: Underwater Vision Engineering for Autonomous Underwater Vehicle | | |
| 1. Under water computer vision | | |
| 2. Design and development of shape memory alloy actuated soft jelly fish robot towards inspection of intricate structures and surveillance with IOT based health monitoring system | Ongoing | |
| 3. Design and analysis of RF Section for K _a -band vacuum electronics devices & Design of a portable remote operated underwater video surveillance vehicle with robotic arm | Ongoing | |
| 4. Investigation of Interaction Model of Cyber-Physical System(s) for Underwater Applications | Ongoing | |
| 5. Smart underwater Monitoring System | Ongoing | |
| 6. Design and Implementation of AI powered Autonomous Underwater Vehicle (AUV) and IoT Enabled Underwater Acoustic Sensor Networks | Ongoing | |
| 7. Development of hardware setup and real time implementation of cooperative motion control algorithm for autonomous underwater vehicle under communication constrain | Ongoing | simulations of cooperative control motion of AUVs has been carried out |
| Project-4: Underwater Communication, Monitoring, Surveillance, Intelligence and Tracking | | |
| 1. Boosting underwater tourism by 3D printed coral reef & Sustainable technologies for underwater tourism | Ongoing | |
| 2. Dolphin monitoring Internet of Things (IoT) Network in River Brahmaputra | Ongoing | |
| 3. Exploration of the aquatic ecosystem of river Brahmaputra | Ongoing | |
| 4. Design and development of different life supporting, monitoring, safety, assisting and communicating devices for divers to prevent and management of diving accidents during underwater exploration | Ongoing | |
| 5. Smart Pond Monitoring System for Aquaculture Farming & Wetland monitoring System, Flood monitoring System | Ongoing | |
| 6. Design and development of a digital holographic microscopic imaging system for detection and recognition of underwater microorganisms and particles | Ongoing | |

List (Names) of products developed:

1st Year

1. *Underwater Robot* for surveillance purpose (Operational)
2. *Underwater Arc welding test bed* (under fabrication)
3. *Underwater laser processing* test bed
4. *Concrete 3D printed parts* for underwater application
5. *Crystal battery* for underwater applications
6. Open-frame underwater vehicles

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7. CPS system for wetland monitoring
8. Low range optical wireless communication device for scuba divers
9. 15 L Oxygen generator has been developed and checked for continuous operation.
10. Automated hydroponic system

ANNEXURE I (A2)

PROJECTS DETAILS YEAR II

| Project Detail Year II | | | | | | |
|---|------|-------------|------------------|----------------|--------------------|--------|
| Name | Area | Project No. | Start (dd/mm/yy) | End (dd/mm/yy) | Ongoing/ Completed | Result |
| Project-1: Underwater Manufacturing, Repairing and Maintenance | | | | | | |
| 1. Design and development of an ROV to perform underwater welding and repairs | | | | | Ongoing | |
| 2. Development of prototypes for retrofitting of underwater structures | | | | | Ongoing | |
| 3. An intelligent vision system for autonomous health monitoring of underwater oil pipelines | | | | | Ongoing | |
| 4. Performance enhancement of underwater marine propellers by the use of additional appendages on propeller boss | | | | | Ongoing | |
| 5. Development of Vibration Monitoring and Diagnostic System for Underwater Mechanical Equipment | | | | | Ongoing | |
| Project-2: The design and development of remotely operated underwater vehicles | | | | | | |
| 1. Design and development of an underwater cleaning robot for marine applications | | | | | Ongoing | |
| 2. Autonomous Underwater Vehicle For Intelligent Real-Time Monitoring and Surveillance | | | | | Ongoing | |
| 3. 6 Pax Multipurpose Solar Powered Electric Boat | | | | | Ongoing | |
| 4. Compact, High-gain Ultrawideband Antennas for Real-time Underwater Wireless Communication | | | | | Ongoing | |
| 5. Development of an Underwater Marine Robot along with Roll Compensated Adaptive Guidance Algorithm. | | | | | Ongoing | |
| Project-3: Underwater Vision Engineering for Autonomous Underwater Vehicle | | | | | | |
| 1. Autonomous Underwater Vehicle Assistance with Video Quality Enhancement and Restoration | | | | | Ongoing | |
| 2. Underwater Vision Based Surveillance and Tracking using Machine Learning | | | | | Ongoing | |
| 3. Design, Development and Integration of Hydrogen Based Energy Storage and Conversion System for Underwater Applications | | | | | Ongoing | |
| 4. Development of Indigenous Ceramic Discs for Sputtering/PLD Applications | | | | | Ongoing | |
| 5. Autonomous Underwater Vehicle Assistance with Video Quality Enhancement and Restoration | | | | | Ongoing | |
| Project-4: Underwater Communication, Monitoring, Surveillance, Intelligence and Tracking | | | | | | |

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|--|---------|--|
| 1. Investigation and Exploration of Smart Transformer based Ship Microgrids System | Ongoing | |
| 2. Demonstration and Implementation of a Bi-directional (>10m) Underwater Optical Communication link with various Modulation Schemes on a Testbed | Ongoing | |
| 3. Predictive Maintenance Tool Development for Thruster and Other Components of Underwater Robot | Ongoing | |
| 4. Validation and optimisation of a solid-state aluminium-ion battery for its electrochemical performance, mechanical stability, and thermal efficiency at a range of temperatures relevant to underwater devices. | Ongoing | |
| 5. Determination of the optimized frequency for underwater RF communication using metaheuristic technique and development of MIMO antenna for underwater communication | Ongoing | |
| 6. Development of Flow-Induced Vibration based Device for Harnessing Renewable Energy from Underwater Water Currents | Ongoing | |
| 7. A Novel Method for Force Measurement on the Underwater Vehicles | Ongoing | |
| 8. Thermal management of components of underwater vehicles. | Ongoing | |

List (Names) of products developed:

2nd Year

1. *Snake Robot* is designed and first prototype is fabricated
2. Portable IoT enabled *water quality monitoring device* (Prototype developed)
3. 3D Printed *Humanoid Robot* (in fabrication stage)
4. *Educational Robot* for Underwater Exploration (Prototype developed)
5. Shape memory alloy-based *Jelly Fish Robot*
6. *Software* developed for underwater vision enhancement
7. Underwater *pipe inspection robot* (Designed)
8. *Holographic* microscopic imaging system (Preliminary Prototype Developed)
9. Design and development of *E- Cycles* (under testing)

PROJECTS DETAILS YEAR III

[illegible]

PATENTS DETAILS YEAR I

[illegible]

ANNEXURE I (B2)

PATENTS DETAILS YEAR II

[illegible]

PATENTS DETAILS YEAR II

[illegible]

ANNEXURE I (C1)

PUBLICATION DETAILS YEAR I

| No. of Total Publication Year I | | | | | | | |
|---------------------------------|---------------------------|----|----------|---------------------------|----|----------|-----------------------|
| Book Name | Article | | | | | | |
| | SCI | | | SCOPUS | | | Conference Proceeding |
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* Impact Factor – IF

** In Citation Box please mention the no. of citation of the publication

*** Name: Please mention the publication name with the author, publisher, and year details

Publications Details Year I

| Sl. No. | Authors | Title | Journal | Conference/ Book Chapters | SCI / SCOPUS | Impact Factor | Citation |
|---------|---|---|---|---------------------------------|-----------------|------------------|----------|
| 1. | P. Sharma and A. Sur | Wavelength-based Attributed Deep Neural Network for Underwater Image Restoration | ACM Transactions on Multimedia Computing, Communications, and Applications, 2021, | | SCI | 3.144 | 7 |
| 2. | D. Dey, D. Srinivas, B. Panda, and T. G. Sitharam | 2nd International Conference on Industry 4.0 and Advanced Manufacturing, January 2022, IISC Bangalore, India. | | Springer Proceedings book- | SCOPUS | | |

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|-----|--|--|--|---|--------|----------------------|----|
| 3. | D. Dey, D. Srinivas, B. Panda, P. Suraneni, and T.G. Sitharam, | Use of industrial waste materials for 3D printing of sustainable concrete: A review | Journal of Cleaner Production, 2022, 130749. | | SCI | 9.29 | 18 |
| 4. | D. Srinivas, D. Dey, B. Panda, and T.G. Sitharam | Comparative analysis of the influence of silica fume and limestone powder on the rheological, mechanical and thermal properties of 3D printed concrete | Advances in Materials Science and Engineering | | SCI | 2.098 | |
| 5. | D. Srinivas, D. Dey, B. Panda, and T.G. Sitharam | 3D Printability and Mechanical Properties of Sustainable Ternary Blends Containing Fly ash and Limestone | | Accepted for publication in Springer Proceedings book | SCOPUS | | |
| 6. | A. Sahoo, S. K. Dwivedy, and P.S. Robi | Compact Low-Cost Unmanned Underwater Vehicle: Design and Fabrication | Proceeding of Institution of Mechanical Engineers Part C | | SCI | 1.758 (Under Review) | |
| 7. | A. Sahoo, S. K. Dwivedy, and P.S. Robi | Adaptive Neuro Fuzzy PID controller for a compact autonomous underwater Vehicle | | Proceeding of Oceans 2022, Hampton roads Oct. 17-19, 2022 | SCOPUS | | |
| 8. | P. K. Vidyarthi, K. Mukherjee and B.K. Roy | FISH-LIKE ROBOTS AND APPLICATIONS OF SENSOR -A REVIEW | | 4th International Conference on Energy, Power and Environment (ICEPE 2022) | SCOPUS | | |
| 9. | B. Patel, J. Narayan and S.K. Dwivedy | Symbiotic Organism Search-based Locomotion of Underwater Snake Robot in various Environments | | 2022 2nd International Conference on Image Processing and Robotics (ICIProb-2022) | SCOPUS | | |
| 10. | B.M. Patel, S.K. Dwivedy | Robust control approach for manoeuvring of planar snake robot in | Journal of Robotics and Autonomous System | | SCI | 3.7 (Under Review) | |

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|-----|---|--|--|--|--------|--------------------------|--|
| | | uncertain underwater environment | | | | | |
| 11. | S. K. Dutta, B.S. Reddy and S.K. Dwivedy | Complibot: A compliant External Pipe Climbing Robot | Mechanics Based Design of Structures and Machines | | SCI | 4.3 (Under Review) | |
| 12. | Sahadev Roy, Kaushal Mukherjee., & Arindam Biswas | Plane region step farming, animal and pest attack control using Internet of Things | | Agricultural Informatics: Automation Using the IoT and Machine Learning, 2021, 249- 269. | SCOPUS | | |

ANNEXURE I (C2)

PUBLICATION DETAILS YEAR II

| No. of Total Publication Year II | | | | | | | |
|----------------------------------|---------------------------|----|----------|---------------------------|----|----------|-----------------------|
| Book Name | Article | | | | | | |
| | SCI | | | SCOPUS | | | Conference Proceeding |
| | Name | IF | Citation | Name | IF | Citation | Name |
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* Impact Factor – IF

** In Citation Box please mention the no. of citation of the publication

*** Name: Please mention the publication name with the author, publisher, and year details

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Publications Details Year II

1. Aditya Roy, Sahadev Roy, (2022) An efficient self-deployment methodology for maximized coverage of mobile underwater sensor networks. International Journal of Communication Systems, 35(13), e5232. <https://doi.org/10.1002/dac.5232> (SCI)
2. Aditya Roy, Sahadev Roy and Subhadeep Mukhopadhyay, "IoT Based Water Quality Monitoring System", Second International Conference on Computer Science Engineering and Applications (ICCSEA), IEEE Conference Record No. 54677, September 08, 2022.(IEEE, Scopus)
3. Roy, A., Mukhopadhyay, S., & Roy, S. (2022, May). IoT Based Real-Time Spring Water Quality Monitoring System. In 2022 1st International Conference on the Paradigm Shifts in Communication, Embedded Systems, Machine Learning and Signal Processing (PCEMS) (pp. 84-87). IEEE.
4. Prasen Kumar Sharma, Ira Bisht, Arijit Sur (2022), Wavelength-based Attributed Deep Neural Network for Underwater Image Restoration, Accepted in ACM Transactions on Multimedia Computing, Communications, and Applications (ACM TOMM), Indexed in (SCI/ Scopus): SCI and Scopus, Impact Factor: 3.144, Citations: 7
5. Sandipan Sarma, Sushil Kumar, Arijit Sur, (2022), Resolving Semantic Confusions for Improved Zero-Shot Detection, Accepted in The 33rd British Machine Vision Conference (BMVC), 21 - 24 November 2022, London, UK
6. Shivani Raj, B. Sandeep Reddy, Arup Deka, A Survey on Fault Tolerant Control of Unmanned Underwater Vehicles, NERC 2022, Guwahati, India, 2022.
7. R. Mohanty, S. Senapati, R. Muduli, S. Patnaik, A. Sahoo, S. K. Pradhan, R. K. Behera, A New Technique for Modelling of an Underwater Robotic Vehicle, Materials Today: Proceedings (presented in conference in July and in review of Materials Today: Proceedings)
8. R. Muduli, R. Mohanty, S. Senapati, S. Patnaik, A. Sahoo, S. K. Pradhan, R. K. Behera, A review on recent advancements in signal processing and sensing technologies for AUVs, 2nd IEEE International Symposium on Sustainable Energy, Signal Processing and Cyber Security (iSSSC 2022) (In review)
9. Vidyarthi P. V., Mukherjee K. , & B K Roy, Fish-Like Robots And Applications Of Sensor -A Review. 4th International Conference on Energy, Power and Environment (ICEPE), NIT Meghalaya, Shillong, Meghalaya, India, April 29-May 1, 2022. 10.1109/ICEPE55035.2022.9798191
10. B. P. Bonthala, B. Panda and U.S. Dixit, A Review on development of Underwater Vehicles for Transportation, North-East Research Conclave 2022, May 20-22, 2022, IIT Guwahati
11. Pratik Raj and Uday S. Dixit, Modelling and CFD Simulation of Hull of an Underwater Vehicle, May 20-22, 2022, IIT Guwahati. Proceedings are getting published by Springer Nature.
12. Dey, D*, Srinivas, D*, Panda, B., Suraneni, P., & Sitharam, T. G. (2022). Use of industrial waste materials for 3D printing of sustainable concrete: A review. Journal of Cleaner Production, 130749. (* Co-first author) Indexed in (SCI/Scopus): SCI Impact factor: 11.072 Citations: 18
13. Dey, D., Srinivas, D., Boddepalli, U., Panda, B., Gandhi, I. S. R., & Sitharam, T. G. (2022). 3D printability of ternary Portland cement mixes containing fly ash and limestone. Materials Today: Proceedings. International Conference of Additive Manufacturing for a Better World, 23 – 25 August 2022, Singapore.
14. Dey, D., Srinivas, D., Panda, B., & Sitharam, T. G. (2023). Processing of cementitious materials for 3D concrete printing. In Industry 4.0 and Advanced Manufacturing (pp. 283-291). Springer, Singapore.

15. Singh, S., Singh, A., Kapil, S. and Das, M., 2022. Utilization of a TSP solver for generating non-retractable, direction favouring toolpath for additive manufacturing. Additive Manufacturing, 59, p.103126.
16. Singh, A., Rajput, A.S., Kapil, S. and Das, M., 2022. Parameter sensitivity analysis of centrifugal spreaders for dispersing metallic powders and material property evaluation for DEM simulation. Powder Technology, p.117958.

ANNEXURE I (C3)

PUBLICATION DETAILS YEAR III

| No. of Total Publication Year III | | | | | | | |
|-----------------------------------|---------------------------|----|---------------------------|--------|----|----------|-----------------------|
| Book Name | Article | | | | | | |
| | SCI | | | SCOPUS | | | Conference Proceeding |
| | Name | IF | Citation | Name | IF | Citation | Name |
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* Impact Factor – IF

** In Citation Box please mention the no. of citation of the publication

*** Name: Please mention the publication name with the author, publisher, and year details

ANNEXURE I (D1)

OTHERS IPs DETAILS YEAR I

[illegible]

ANNEXURE I (D2)

OTHERS IPs DETAILS YEAR II

[illegible]

ANNEXURE I (D3)

OTHERS IPs DETAILS YEAR II

[illegible]

ANNEXURE II (A1)

FELLOWSHIP DETAILS YEAR I

| No. of Total Fellowship Granted Year I | | | | | | |
|--|--------|----------------------------|---------------------|------------------|----------------|------------------|
| Course | Sex | Name | Registration Number | Start (dd/mm/yy) | End (dd/mm/yy) | Fellowship (Rs.) |
| UG | Female | | | | | |
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| PG | Female | | | | | |
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| | | | | | | |
| | Male | Amit Pareek | 214156001 | 2021 | Continuing | 12400 (TIH Fund) |
| | | Ashish Kumar Soni | 214156002 | | Continuing | |
| | | Keyur Anil Sangwai | 21415600 | | Continuing | |
| | | Perumalla Rithin Vamshi | 21415605 | | | 12400 (TIH Fund) |
| | | Soumik Pramanik | 214156007 | | Continuing | |
| | | Tara Chand | 214156008 | | Continuing | |
| | | V Ganesh Rama Krishna Raju | 214156009 | | Continuing | 12400 (TIH Fund) |
| | | Vignesh P | 214156010 | | Continuing | |
| | | Saba Zaidi | 214156011 | | Continuing | 12400 (TIH Fund) |
| | | Adarsh Patidar Adarsh | 214156012 | | Continuing | |
| | | Pratiush Anand | 214156013 | | Continuing | 12400 (TIH Fund) |
| | | Konduru Vijay | 214156014 | | Continuing | 12400 (TIH Fund) |
| | | Mayank Mishra | 214156015 | | Continuing | |
| | | Aman Aggarwal | 214156016 | | Continuing | 12400 (TIH Fund) |

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| | | | | | | |
|-----|--------|-----------------------------|-----------|------|------------|------------------|
| | | Amit Kumar | 214156017 | | Continuing | 12400 (TIH Fund) |
| | | Rishit Singh | 214156018 | | Continuing | 12400 (TIH Fund) |
| | | Prabhat Kumar | 214156006 | | Continuing | |
| | Total | 17 | | | | |
| PhD | Female | Syed Bustan Fatima Warsi | 216156105 | 2021 | Continuing | 31000 |
| | | Pranjali Singh | 216156102 | 2021 | Continuing | |
| | | Antara Sarkar | 216156101 | 2021 | Continuing | |
| | Male | Ajeet Rai | 206104115 | 2020 | Continuing | |
| | | Dodda Srinivas | 206156102 | 2020 | Continuing | |
| | | Praveen Chauhan | 206105108 | 2020 | Continuing | |
| | | Deep Arya | 206102110 | 2020 | Continuing | |
| | | Suraj Kumar | 206102109 | 2020 | Continuing | |
| | | Bhanu Prakash Bonthala | 206103122 | 2020 | Continuing | |
| | | Shrihari A | 206102111 | 2020 | Continuing | |
| | | Sahil Narwal | 206103123 | 2020 | Continuing | |
| | | Subhojit Jash | 206156110 | 2020 | Continuing | |
| | | Shyamal Mishra | 216156103 | 2021 | Continuing | |
| | | Souradip Pal | 216156104 | 2021 | Continuing | |
| | | Udit Sharma | 216156003 | 2021 | Continuing | |
| | | Mouly Bhowmick | 206105109 | 2020 | Continuing | |
| | Total | 16 | | | | |
| PDF | Female | | | | | |
| | Male | Anshul Garg | | 2021 | Continuing | |
| | Total | 1 | | | | |

ANNEXURE II (A2)

FELLOWSHIP DETAILS YEAR II

| No. of Total Fellowship Granted Year II | | | | | | |
|---|---|---------------------------|---------------------|------------------|----------------|------------------|
| Course | Sex | Name | Registration Number | Start (dd/mm/yy) | End (dd/mm/yy) | Fellowship (Rs.) |
| UG | List of 72 participants are given in Annexure II (A2): A | | | | | |
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| | | | | | | |
| PG | Female | | | | | |
| | Male | Abhishek Tripathi | 224156001 | | | 12400 (TIH Fund) |
| | | Ashish Kumar | 224156003 | | | 12400 (TIH Fund) |
| | | Hariansh Sehgal | 224156006 | | | 12400 (TIH Fund) |
| | | Mukesh Chahar | 224156007 | | | 12400 (TIH Fund) |
| | | Sanjeet Bara | 224156010 | | | 12400 (TIH Fund) |
| | | Aniket Gajanan Zope | 224156014 | | | 12400 (TIH Fund) |
| | | Gyan Ratna | 224156016 | | | 12400 (TIH Fund) |
| | | P V Rohith Kumar | 224156017 | | | 12400 (TIH Fund) |
| | | Raju Krishna Sharma | 224156019 | | | 12400 (TIH Fund) |
| | | Sushant Suresh Pargaonkar | 224156020 | | | 12400 (TIH Fund) |
| | Total | 10 | | | | |
| PhD | Female | | | | | |
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| | Male | | | | | |
| | | | | | | |
| | Total | | | | | |
| | Female | | | | | |
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| PDF | Male | | | | | |
| | Total | | | | | |

Annexure II (A2): A

List of participants: UG

| Sl. No. | Names | Sex | E-mail Ids |
|---------|------------------------|-----|----------------------------------|
| 1. | Kavyashree T | F | kavyashree.20mc@kct.ac.in |
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| 11. | Md Sajid Siddiqui | M | sajidsiddiqui918@gmail.com |
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| 35. | Nishu verma | M | nishukim756497@gmail.com |
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| 43. | Manvir Singh Lamba | M | lambamanvir@gmail.com |
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| 45. | Priyanki Priyam Borgohain | M | priyanki_ug@ee.nits.ac.in |
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| 51. | DHANESHWAR RAJWAR | M | dhaneshwar7546@gmail.com |
| 52. | RAHUL KUMAR | M | rohit2442000@gmail.com |
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| 65. | Rajat Kumar Muduli | M | rk.muduli2001@cet.edu.in |
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| 68. | Abhinav Arunesh | M | abhinavarunesh745@gmail.com |
| 69. | Udita Mishra | M | uditamishra30@gmail.com |
| 70. | Vikram kumar | M | 4vikramkr@gmail.com |
| 71. | Dev Kartik | M | dev_ug@civil.nits.ac.in |
| 72. | SOUMYAJIT DATTA | M | soumyajitdatta123@gmail.com |

ANNEXURE II (A3)

FELLOWSHIP DETAILS YEAR III

| No. of Total Fellowship Granted Year III | | | | | | |
|--|--------|------|---------------------|------------------|----------------|------------------|
| Course | Sex | Name | Registration Number | Start (dd/mm/yy) | End (dd/mm/yy) | Fellowship (Rs.) |
| UG | Female | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | Male | | | | | |
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| | | | | | | |
| | Total | | | | | |
| PG | Female | | | | | |
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| | Male | | | | | |
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| | Total | | | | | |
| PhD | Female | | | | | |
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| | Male | | | | | |
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| | | | | | | |
| | Total | | | | | |
| PDF | Female | | | | | |
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| | Male | | | | | |
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| | Total | | | | | |

ANNEXURE II (B1)

DETAILS OF CHAIR PROFESSORS' YEAR I

| Chair Professors Year I | | | | | | |
|-------------------------|--------------------|-----------------|--------------------------------|----------------------|--------------------|-----------------|
| Category | Name | Designation | Area | Start (dd/mm//yy) | End (dd/mm//yy) | Salary (Rs.) |
| Female | | | | | | |
| | | | | | | |
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| | | | | | | |
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| | | | | | | |
| | | | | | | |
| Male | Prof. N. R. Mandal | Chair Professor | Naval Architecture | 31/02/21 | 31/03/22 | 80,000 + HRA |
| | Mr. P. P. Dasgupta | Senior Fellow | HR and Business Administration | 31/02/21 | 31/03/22 | 80,000 + HRA |
| | | | | | | |
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| | | | | | | |
| Total | 2 | | | | | |

ANNEXURE II (B2)

DETAILS OF CHAIR PROFESSORS' YEAR II

| Chair Professors Year II | | | | | | |
|--------------------------|------|-------------|------|----------------------|--------------------|-----------------|
| Category | Name | Designation | Area | Start (dd/mm//yy) | End (dd/mm//yy) | Salary (Rs.) |
| Female | | | | | | |
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| Male | | | | | | |
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| | | | | | | |
| Total | | | | | | |

ANNEXURE II (B3)

DETAILS OF CHAIR PROFESSORS' YEAR III

| Chair Professors Year III | | | | | | |
|---------------------------|------|-------------|------|----------------------|--------------------|-----------------|
| Category | Name | Designation | Area | Start (dd/mm//yy) | End (dd/mm//yy) | Salary (Rs.) |
| Female | | | | | | |
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| Male | | | | | | |
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| | | | | | | |
| Total | | | | | | |

ANNEXURE II (C1)

SKILL DEVELOPMENT YEAR I

| Skill Development Year I | | | | | | | |
|--------------------------|--|--|--------------|------------------------------------|------------------------------------|--------------------|--|
| Category | Organization | Sex | Participants | Start (dd/mm/yy) | End (dd/mm/yy) | Duration (Hrs.) | Remarks |
| Workshops | IIT Guwahati TIDF | Details of the 72 participants are given in Annexure II (C1): A | | 30 th August 2021 | 31 st August 2021 | 16 hours | Underwater Technologies and Challenges Associated |
| Workshops | IIT Guwahati TIDF | Details of the 116 participants are given in Annexure II (C1): B | | 10 th December 2020 | 11 th December 2020 | | 2 Days Workshop on CAD CAM |
| Workshops | IIT Guwahati TIDF & NBRI Lucknow | Details of the 167 participants are given in Annexure II (C1): C | | 7 th September 2021 | 7 th September 2021 | | National Workshop on Cloud computing and water ecosystem modelling |
| Workshops | IIT Guwahati TIDF & NBRI Lucknow | Details of the 167 participants are given in Annexure II (C1): C | | 24 th September 2021 | 24 th September 2021 | | National workshop on the cumulative impact assessment framework for Himalayan Rivers |
| Training Programs | | Female | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | Male | | | | | |
| | | | | | | | |

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| | | | | | | | |
|-------------|--|--------|--|--|--|--|--|
| | | | | | | | |
| | | Total | | | | | |
| Conferences | | Female | | | | | |
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| | | | | | | | |
| | | Male | | | | | |
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| | | | | | | | |
| | | | | | | | |
| | | Total | | | | | |
| Others* | | Female | | | | | |
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| | | | | | | | |
| | | Male | | | | | |
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| | | | | | | | |
| | | Total | | | | | |

***Find Details of Others Here**

1. IIT Guwahati Expert talk by Mr. S. P. Swant, (Welding Engineer and Mechanical Engineer, ASNT Level III, AWS - Certified Welding Inspector, CSWIP - TWI (Cambridge - UK), TIH-IITG on ""Underwater Welding: Challenges and Opportunities, at 23rd August 2021, 5 PM.
2. IIT Guwahati Expert talk by Mr. Gilbert V. Antony, a professional underwater diver on "An Immersive View into Commercial Diving, at 16th August 2021, 2 PM.
3. IIT Guwahati Expert talk by Prof. N R Mandal, Former Professor, Ocean Engineering and Naval Architecture, IIT Kharagpur, on "Challenges and Opportunities in Underwater Technologies", 17th June, 10 AM.

4. IIT Guwahati Expert talk by Hon'ble chairman of "Marine Products Export Development Authority (MPEDA), K.S. Srinivas, I.A.S., on Underwater Exploration.
5. Dr. (Cdr) Arnab Das, Founder & Director of the Maritime Research Centre (MRC), Pune, delivered a talk on "Underwater Domain Awareness (UDA) Framework: Challenges & Opportunities" on 9th September 2021 at 17:00

ANNEXURE II (C1): A

| Sl. No. | Participants Organization | Sex | Participants Names |
|---------|---------------------------|-----|----------------------------|
| 1. | CICPS IIT Guwahati | M | Amit Pareek |
| 2. | CICPS IIT Guwahati | M | Ashish Kumar Soni |
| 3. | CICPS IIT Guwahati | M | Keyur Anil Sangwai |
| 4. | CICPS IIT Guwahati | M | Perumalla Rithin Vamshi |
| 5. | CICPS IIT Guwahati | M | Soumik Pramanik |
| 6. | CICPS IIT Guwahati | M | Tara Chand |
| 7. | CICPS IIT Guwahati | M | V Ganesh Rama Krishna Raju |
| 8. | CICPS IIT Guwahati | M | Vignesh P |
| 9. | CICPS IIT Guwahati | M | Saba Zaidi |
| 10. | CICPS IIT Guwahati | M | Adarsh Patidar Adarsh |
| 11. | CICPS IIT Guwahati | M | Pratiush Anand |
| 12. | CICPS IIT Guwahati | M | Konduru Vijay |
| 13. | CICPS IIT Guwahati | M | Mayank Mishra |
| 14. | CICPS IIT Guwahati | M | Alok Kumar Trivedi |
| 15. | CICPS IIT Guwahati | M | SIDDARTH GAUTAM |
| 16. | CICPS IIT Guwahati | M | Vinay Kumar |
| 17. | CICPS IIT Guwahati | M | Ashwinee Narware |
| 18. | CICPS IIT Guwahati | M | RASHIK KALITA |
| 19. | CICPS IIT Guwahati | M | Tarang Kamble |
| 20. | CICPS IIT Guwahati | F | Syed Bustan Fatima Warsi |
| 21. | CICPS IIT Guwahati | F | Pranjali Singh |
| 22. | CICPS IIT Guwahati | F | Antara Sarkar |
| 23. | CICPS IIT Guwahati | M | Ajeet Rai |
| 24. | CICPS IIT Guwahati | M | Dodda Srinivas |
| 25. | CICPS IIT Guwahati | M | Praveen Chauhan |
| 26. | CICPS IIT Guwahati | M | Deep Arya |
| 27. | CICPS IIT Guwahati | M | Suraj Kumar |
| 28. | CICPS IIT Guwahati | M | Bhanu Prakash Bonthala |
| 29. | CICPS IIT Guwahati | M | Shrihari A |
| 30. | CICPS IIT Guwahati | M | Sahil Narwal |
| 31. | CICPS IIT Guwahati | M | Subhojit Jash |
| 32. | CICPS IIT Guwahati | M | Shyamal Mishra |
| 33. | CICPS IIT Guwahati | M | Souradip Pal |

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| | | | |
|-----|--------------------------|---|--------------------|
| 34. | CICPS IIT Guwahati | M | Udit Sharma |
| 35. | CICPS IIT Guwahati | M | Mouly Bhowmick |
| 36. | IIT Guwahati TIDF | M | Anshul Garg |
| 37. | IIT Guwahati TIDF | M | Sibananda Mohanty |
| 38. | IIT Guwahati TIDF | M | Anurag Tiwari |
| 39. | IIT Guwahati TIDF | M | Ashish Mahato |
| 40. | IIT Guwahati TIDF | M | Om Kumar |
| 41. | IIT Guwahati TIDF | M | Vikash Yadav |
| 42. | IIT Guwahati TIDF | M | Ashish Kumar Singh |
| 43. | IIT Guwahati TIDF | M | Alok Negi |
| 44. | IIT Guwahati TIDF | M | Nikhil Choudhry |
| 45. | IIT Guwahati TIDF | M | Rajan Gupta |
| 46. | IIT Guwahati TIDF | F | Iba Parvin |
| 47. | IIT Guwahati TIDF | F | Garima Agarwal |
| 48. | ME Dept. IIT Guwahti | M | M Bhavik Patel |
| 49. | ME Dept. IIT Guwahti | M | Rahul R Bharati |
| 50. | ME Dept. IIT Guwahti | M | Ranit Roy |
| 51. | ME Dept. NIT Rourkela | M | R K Behera |
| 52. | ME Dept. NIT Rourkela | M | D R K Parhi |
| 53. | ME Dept. NIT Calicut | M | Basil Kuriachen |
| 54. | ME Dept. IIT Roorkee | M | P M Pathak |
| 55. | ME Dept. IIT Jodhpur | M | Barun Pratiher |
| 56. | ME Dept. IIT Guwahati | M | Sajan Kapil |
| 57. | ME Dept. IIT Guwahati | M | B Sandeep Reddy |
| 58. | CSE Dept. IIT Guwahati | M | Arijit Sur |
| 59. | VSSUT Burla | M | Bikramaditya Das |
| 60. | NIT Arunachal Pradesh | M | P Mohanty |
| 61. | NIT Arunachal Pradesh | M | Sahadev Roy |
| 62. | NIT Silchar | M | B K Roy |
| 63. | ME Dept. IIT Guwahati | M | P S Robi |
| 64. | ME Dept. NIT Meghalaya | M | Avilash Sahoo |
| 65. | EEE Dept. IIT Guwahati | M | P Guha |
| 66. | ME Dept. IIT Guwahati | M | V Kulkarni |
| 67. | Civil Dept. IIT Guwahati | M | S Dutta |
| 68. | Civil Dept. IIT Guwahati | M | Rishikesh Bharti |
| 69. | ME Dept. IIT Guwahati | M | Shiv Sahaya Shukla |
| 70. | EEE Dept. IIT Guwahati | M | Rishikesh Kulkarni |
| 71. | ME Dept. IIT Guwahati | M | Pankaj Biswas |
| 72. | ECE Dept. NIT Mizoram | F | Chaitali Koley |

ANNEXURE II (C1): B

| Sl. No. | Participants Organization | Sex | Participants Names |
|---------|---|-----|-------------------------|
| 1. | Chemistry, IIT Guwahati | M | Saranya |
| 2. | Chemistry, IIT Guwahati | M | Thalesh Pal |
| 3. | Engineering physics, IIT Guwahati | M | Yash Sharma |
| 4. | Engineering Physics IITG | M | Bhushan Surwade |
| 5. | Centre for Rural Technology, IIT Guwahati | M | Dibojit Pathak |
| 6. | Indian Institute of Technology, Guwahati | F | Ayushi Jain |
| 7. | Centre for rural technology, IIT Guwahati | M | Mindewar Amey Shriram |
| 8. | Department of Mechanical Engineering, IIT Guwahati | M | Abhishek Patil |
| 9. | Electronics and electrical engineering , IIT Guwahati | M | Vuppala Vishnu Vardhan |
| 10. | Chemical engineering IIT Guwahati | M | Chinmay Zinjal |
| 11. | Mechanical department, IITG | M | Kosuri V. Sai Ram Varma |
| 12. | Mechanical Engineering, IIT Guwahati | M | Arnav Singh |
| 13. | civil engineering and IIT Guwahati | M | Vishal Kumar |
| 14. | Mechanical Engineering, IIT Guwahati, Assam | M | Alok Kumar Trivedi |
| 15. | BSBE AND IITG | M | Siddarth Gautam |
| 16. | IITG Data Science | M | Vinay Kumar |
| 17. | Indian institute of technology Guwahati | M | Ashwinee Narware |
| 18. | Engineering physics , IITG | M | Rashik Kalita |
| 19. | Engineering Physics-IIT Guwahati | M | Tarang Kamble |
| 20. | IIT Guwahati- civil | M | Utkarsha Awasthi |
| 21. | Electrical Engg. Dept. at IIT Guwahati | M | Faraz Ahmad |
| 22. | Mechanical engineering IIT Guwahati | M | Pankaj Kumar |
| 23. | Department of Mechanical Engineering IIT Guwahati | M | Sagar Pawar |
| 24. | Mechanical, IIT Guwahati | M | Harish Kumar Tomar |
| 25. | Communication Engineering, IIT Guwahati | M | Omkar Jadhav |
| 26. | Chemical engineering. IIT Guwahati | M | Rishav Agrawal |
| 27. | Engineering Physics IIT Guwahati | M | Chetan Chinchulkar |
| 28. | ME, IITG | M | Avanish Anand |
| 29. | Department of Design, IIT Guwahati | M | Harsh Parashar |
| 30. | Engineering physics IIT Guwahati | M | Vanshita Sharma |
| 31. | Mechanical engineering, IIT GUWAHATI | M | Yashwant Rawat |
| 32. | Chemical Engineering | M | Sushil Munda |
| 33. | Mechanical Engineer, IIT Guwahati | M | Aayush Sharma |

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| | | | |
|-----|--|---|-----------------------------|
| 34. | MS-R IN E-MOBILITY, IIT GUWAHATI | M | Vishal Maurya |
| 35. | Mechanical Engineering IIT Guwahati | M | Divyanshu Prakash |
| 36. | IITG | F | Deepanshi Garg |
| 37. | EEE | F | Kanupriya Meena |
| 38. | center for nanotechnology and IIT Guwahati | M | Ethireddy Radhika |
| 39. | Department of Design, IIT Guwahati | M | Sagar Chirankar |
| 40. | Mathematics and computing | M | Dhruvesh Bhure |
| 41. | EEE and IITG | M | Amit Kumar Baghel |
| 42. | IIT Guwahati EEE | M | Abhishek Raj |
| 43. | Department of Design, IIT Guwahati | M | Shyam Kumar Singh Munda |
| 44. | IIT GUWAHATI | M | Abhinav Kumar |
| 45. | Mechanical Engineering, IIT Guwahati | M | Hari Narayan Singh Yadav |
| 46. | Mechanical Department (IITG) | M | Varshith |
| 47. | Mechanical Engg. IIT Guwahati | M | Ritesh Gole |
| 48. | Chemical Engineering Department IIT Guwahati | M | Deepak Kumar Mishra |
| 49. | ECE, IIT Guwahati | M | Jashwanth |
| 50. | IITG | M | P Gowri Shankar |
| 51. | Mechanical Engg. in IITG | M | Saranya. RT |
| 52. | Chemistry, IIT Guwahati | M | Triasha Pal |
| 53. | Chemical department, IIT Guwahati | M | Jagannath Prasad Patranayak |
| 54. | Physics | M | Ravi Kiran Dokala |
| 55. | Mechanical Engg., IIT Guwahati | M | Partha Maji |
| 56. | IIT Guwahati | M | Ambati Mohan Kumar |
| 57. | Mechanical engineering IIT Guwahati | M | V Harshvardhan |
| 58. | Mechanical Engineering, IIT Guwahati | F | Khushi Meena |
| 59. | Dept. of Design, IIT Guwahati | M | M. Angelus Khoh |
| 60. | Mechanical, IIT Guwahati | M | Karan Soni |
| 61. | Mechanical, IITG | M | Sunil Samarwal |
| 62. | BSBE IIT Guwahati | M | Aditya Raj |
| 63. | Mechanical Engineering, IIT Guwahati | M | Rushabh Parikh |
| 64. | Mechanical Engg, IIT Guwahati | M | Evenmore Myllem |
| 65. | Engineering Physics, IIT Guwahati | M | Soham Atkar |
| 66. | Production Engineering, NIT Tiruchirappalli | M | Satheeshkumar V |
| 67. | Mechanical Dept., ANITS Visakhapatnam | M | Dr. Satyanarayana Katakam |
| 68. | St. Peters Engineering College | M | Nagendra Akula |
| 69. | Chemical Engineering, IIT Guwahati | M | Robinson Timung |
| 70. | Mechanical Engineering, IIT Guwahati | M | Niraj Vilas Sonule |
| 71. | Civil IITG | M | Kaushlendra Singh Parihar |
| 72. | Mechanical Engineering, IIT Guwahati | M | Potturu Bharath Kumar |
| 73. | IITG Mechanical Engineering | M | Durgansh Mishra |
| 74. | IITG | F | Shreya Umrao |
| 75. | Mechanical Engineering And IIT Guwahati | M | Abhijeet Veer |

| | | | |
|------|---|---|---------------------------------|
| 76. | Mechanical Department, JIST | M | Bitopan Kalita |
| 77. | Chemical Science And Technology, IIT Guwahati | M | Amresh Prasad Sinha |
| 78. | IITG | M | Yatharth Patil |
| 79. | Chemical Engineering & IITG | M | Narendren S |
| 80. | Chemical science and technology IIT Guwahati | M | Yashwi Bharti |
| 81. | CST and IIT Guwahati | M | Sahil Nain |
| 82. | Department of Mechanical Engineering, NERIST | M | Jyotisman Borah |
| 83. | Design | M | Anirudh Praveen |
| 84. | Mechanical Engineering (JIST) | M | Shekhar Sharma |
| 85. | IIT GUWAHATI | M | Sandeep T S |
| 86. | Mechanical and IIT Guwahati | M | Siddharth Keshar |
| 87. | Mechanical engineering | F | Anjali Kumari Singh |
| 88. | Chemical engineering, IIT Guwahati | M | Ankit Vijayshankar Tiwari |
| 89. | BTech Mechanical IIT Guwahati | M | Harsh Rana |
| 90. | Mechanical engineering, IIT Guwahati | M | Vidya Sagar Vepa |
| 91. | Petroleum Science and Technology (Chemical Engg) | M | Vinay Kumar |
| 92. | ECE ,IIT Guwahati | M | Ch.Venkat Vikas |
| 93. | Mechanical Engineering Department, IIT Guwahati | M | Kirankumar Bomburi |
| 94. | Department of Mechanical Engineering, Adama Science and Technology University | M | Perumalla Janaki Ramulu |
| 95. | Mechanical engineering IITG | M | T Lhingminchong Haokip |
| 96. | IIT Guwahati | M | Rahul Aggarwal |
| 97. | Civil department and IIT Guwahati | M | Chetan Prakash |
| 98. | Chemical Science and Technology, IITG | M | Amresh Prasad Sinha |
| 99. | Department of mechanical engineer, IIT Guwahati | M | Priyabrata Nath |
| 100. | Mechanical | F | Shreya Singh |
| 101. | Design department , IIT Guwahati | M | Vishnudath P |
| 102. | Mechanical engineering, North Eastern Regional Institute Of Science And Technology | M | Chiranjit Sau |
| 103. | Dept. of Mechanical and Manufacturing Engineering, M. S. Ramaiah university of Applied Sciences, Bangalore, india | M | Dr. Suresh R |
| 104. | Mechanical Engineering , IIT Guwahati | M | Ankit Singh Rawat |
| 105. | Mechanical Engineering, IIT Guwahati | M | Bipul Brahma |
| 106. | Mechanical department IIT GUWAHATI | M | Dheeraj Nahar |
| 107. | Mechanical Engineering, IIT Guwahati | M | Shivam Panwar |
| 108. | Mechanical engineering , NERIST | M | Chiranjit Sau |
| 109. | Mechanical Engineering, IIT Guwahati | M | Snigdha Chandra |
| 110. | IITG | M | Jyotishman Pathak |
| 111. | computer science and engineering and IIT Guwahati | M | Pranshu Kandoi |
| 112. | Mechanical Engineering, NIT Durgapur | M | Shibendu Shekhar Roy |
| 113. | mechanical engineering ; IIT Guwahati | M | Christopher Jose Chittilappilly |
| 114. | Department of Mechanical Engineering IIT Guwahati | M | Sagar Pawar |

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|------|--------------------------------------|---|---------------|
| 115. | Mechanical engineering, IIT Guwahati | M | Ambrish Singh |
| 116. | Mechanical ,IITG | M | Yash Joshi |

ANNEXURE II (C1): C

| Sl. No . | Participants Organization | Sex | Participants Names |
|----------|--|-----|---------------------------|
| 1. | IIT Guwahati | M | Mridupawan Deka |
| 2. | Indian Institute of Technology Roorkee | M | Gagandeep Singh |
| 3. | National Institute of Hydrology | M | Dr. Rajesh Singh |
| 4. | National Institute of Hydrology (NIH), Roorkee | F | Jyoti P Patil |
| 5. | IIT PATNA | M | Saket Kumar |
| 6. | National Institute of Hydrology | M | Dr. B. Venkatesh |
| 7. | IIT Patna | M | Ahmad Rashiq |
| 8. | Anjuman institute of technology and management | F | Sumisha K |
| 9. | Visvesvaraya Technological University, Belagavi | M | Dr.Nagraj S. Patil |
| 10. | Orissa University of Agriculture and Technology | M | Meenaketan Shee |
| 11. | IIT Mandi | M | Amit Dubey |
| 12. | Indian Institute of Engineering Science and technology | M | Syed Bakhtawar Bilal |
| 13. | Birla Institute of Technology, Mesra | M | Dr. Akshay Kumar |
| 14. | Indian Institute of Technology Bombay | M | Rakesh Kumar Sinha |
| 15. | Western Himalayan Regional Centre, National Institute of Hydrology | M | Dr. Ravindra Vitthal Kale |
| 16. | Debre Markos University | M | Arega Mulu |
| 17. | Debre Markos University | M | Arega Mulu |
| 18. | College of Engineering and Technology, Bhubaneswar | F | Swetalina Nath |
| 19. | NIST,Berhampur,Odisha | F | Padminee Samal |
| 20. | Aligarh Muslim University | F | Dr. Mohammad Mulhim |
| 21. | IIT(ISM) Dhanbad | F | Sachidanand Kumar |
| 22. | IIT BOMBAY | F | Shivansh |
| 23. | Sardar Vallabhbhai National Institute of Technology, Surat | F | Resmi S R |
| 24. | GIET, baniatangi,bbsr | F | Anindita Swain |
| 25. | CUTM | M | Dr Kapileswar Mishra |
| 26. | JNTUH | M | Chandras |
| 27. | NIT Karnataka | F | Benita Susan Thomas |
| 28. | Synergy Institute of Engineering and Technology | M | Shasanka Sekhar Barik |
| 29. | University Visvesvaraya college of engineering | F | Poornima R K |

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| | | | |
|-----|---|---|------------------------|
| 30. | University Visvesvaraya College of Engineering, Bengaluru | M | Kishora |
| 31. | Punjab Agricultural University | M | Navneet Sharma |
| 32. | NIT SURATHKAL | M | Nithin Varghese John |
| 33. | GITAM University | M | Bharath A |
| 34. | UTTAR BANGA KRISHI VISWAVIDYALAYA | M | Dr. Bratati Chowdhury |
| 35. | UVCE Bangalore University Bangalore | M | Shivakumar Nyamathi |
| 36. | NIT PATNA | M | Anubhav Baranwal |
| 37. | National Institute of Technology Patna | M | Bhineshwar Brahmachari |
| 38. | Shershah Engineering College | M | Sumit Kumar |
| 39. | Hydromancy consultancy Pvt Ltd | M | Avinash G |
| 40. | Indian Institute of Technology Roorkee | M | Deen Dayal |
| 41. | IIT Guwahati | M | Chiradip Barua |
| 42. | Indian Institute of Technology Roorkee | M | Kavach Mishra |
| 43. | Indian Institute of Science, Bangalore | M | Ashlin Ann Alexander |
| 44. | National Institute of technology, Patna | M | Abhishek Kumar |
| 45. | National Institute of Technology Patna | F | Shakshi Gupta |
| 46. | National institute of technology Karnataka | F | Pooja H Chabbi |
| 47. | Acharya N. G. Ranga Agricultural University | M | Dr. K. Krupavathi |
| 48. | BMS College of Engineering | M | Madhusudhan H M |
| 49. | B.M.S. College of Engineering, Bangalore | M | Dr. Reshmi Devi T.V |
| 50. | G. B. Pant National Institute of Himalayan Environment | M | Vaibhav Eknath Gosavi |
| 51. | IIT (ISM) Dhanbad | M | Prabal Das |
| 52. | BMS College of Engineering | F | Nanditha H S |
| 53. | SES R C PATEL INSTITUTE OF TECHNOLOGY, SHIRPUR | M | Rajendra Dinkar Patil |
| 54. | Sam Higginbottom University of agriculture, Technology and Sciences | F | Sanjana Singh |
| 55. | R.C.Patel Institute of Technology, Shirpur | M | Aakash |
| 56. | SHUATS | M | Vinay Kumar |
| 57. | Indian Institute of Technology Roorkee | M | Anshul Yadav |
| 58. | National Centre for Earth Science Studies | M | Rajat Kr Sharma |
| 59. | Visvesvaraya Technological University, Belagavi, Karnataka | M | Nataraja M |
| 60. | Indian Institute of Technology Guwahati | M | Arnab Kumar Pal |
| 61. | Indian Institute of Technology Guwahati | F | Shivani Gupta |
| 62. | Indian Institute of Technology Roorkee | F | Stuti Shah |
| 63. | NIT Andhrapradesh | M | Nagella Venkateswarlu |
| 64. | THE NATIONAL INSTITUTE OF ENGINEERING, MYSURU | M | Shashikiran D C |
| 65. | Indian Institute of Technology, Guwahati | F | Uma Narayan M |
| 66. | NITK Surathkal | M | Guguloth Praveen Kumar |
| 67. | IIT Guwahati | F | Ritu |
| 68. | KLE Tec hnological Univerrsity Hubballi | F | Prema Malali |

| | | | |
|------|--|---|---------------------------|
| 69. | KLE Technological University, Hubballi, Karnataka | M | Vinayak S Naikar |
| 70. | JNKVV Jabalpur | M | Dr. Sourabh Nema |
| 71. | UTD CSVTU BHILAI CHHATTISGARH | F | Navneet Kumar Sahu |
| 72. | SR University Warangal | M | Vinay Shivamurthy |
| 73. | Dr BSKKV, Dapoli | M | Bajrang Ayare |
| 74. | North Eastern Space Applications Centre | M | Praveen Kumar |
| 75. | NIT Patna | F | Sweety Rajput |
| 76. | SPGT | F | Rani D S |
| 77. | North Eastern Space Applications Centre | F | Arundhati Kundu |
| 78. | Shiv Nadar University | M | Ghanshyam Giri |
| 79. | North Eastern Space Applications Centre | F | Aatreyee Nath |
| 80. | Institute of Advanced Study in Science and Technology | M | Devabrat Sharma |
| 81. | National Institute of Technology Karnataka | M | Francis P Mathew |
| 82. | IIT INDORE | M | Vijay Jain |
| 83. | Dr BSKKV dapoli | F | Neelam Kumari |
| 84. | IIT JAMMU | M | Rishi Gupta |
| 85. | Institute of infrastructure technology research and management | M | Ujjawal Prakash |
| 86. | NORTH EASTERN SPACE APPLICATIONS CENTRE(NESAC) | M | Gokul Anand |
| 87. | IIT Patna | M | Ahmad Rashid |
| 88. | NIT Andhra Pradesh | M | Rathna Kumar Vakkalagadda |
| 89. | Indian Institute of Technology Ropar | M | Thallam Prashanth |
| 90. | IIT Ropar | M | Dolon Banerjee |
| 91. | Former ISRO-NRSC-RRSC-South / KITS-Coimbatore | M | Jagadeesha Chinagudi |
| 92. | IIT ROORKEE | M | Ashwini Tiwari |
| 93. | IIT Roorkee | M | M. Sathyaseelan |
| 94. | Indian Institute of Technology Roorkee | M | R. Vinnarasi |
| 95. | University of Horticultural Sciences, Bagalkot, Karnataka | M | Shankar Meti |
| 96. | Indian Institute of technology Roorkee | M | Pawan Singh |
| 97. | St. Martin's Engineering College, Secunderabad | M | Dr. Jnana Ranjan Khuntia |
| 98. | IIT Guwahati | M | Ajeet Rai |
| 99. | Indian Institute of Remote Sensing | M | Ashutosh Kumar Jha |
| 100. | IIT Guwahati | F | Meghna Ray |
| 101. | Indian Institute of Technology Roorkee | M | Shishant Gupta |
| 102. | IIT Bombay | M | Manish kumar Dhasmana |
| 103. | CSIR-NBRI | F | Babita Joshi |
| 104. | CSIR-NBRI | M | Dibyendu Adhikari |
| 105. | DRDO | M | Harikrishnan G |
| 106. | Indian Institute of Technology Guwahati | M | Moustafa Najm |
| 107. | Indian Institute of Technology, Guwahati | M | Suraj Kumar |
| 108. | Indian Institute of Remote Sensing, ISRO | M | Triparna Sett |

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| | | | |
|------|--|---|--------------------------|
| 109. | IIT Guwahati | M | Papu Kumar Naik |
| 110. | Siddaganga Institute of Technology | M | Sreedhara B M |
| 111. | IIT Guwahati | M | Ved Prakash |
| 112. | Retired | M | Rama Prasad |
| 113. | National Institute of Technology Surathkal | M | Jain Deepak Ramesh |
| 114. | University Visvesvaraya College of Engineering, Bangalore University | F | Pallavi Kumari |
| 115. | Indian Institute of Technology Bombay Mumbai | M | Rakesh Kumar Sinha |
| 116. | CENTRE FOR WATER RESOURCES, ANNA UNIVERSITY, CHENNAI | M | Balamurugan R |
| 117. | IIT(ISM) Dhanbad | M | Gautam Roy |
| 118. | IIT GUWAHATI | M | Shankar Ghosh |
| 119. | CUTM | M | Dr Kapileswar Mishra |
| 120. | NIE MYSORE | M | Malluraj Channappa Hitni |
| 121. | National Institute of Technology Karnataka | F | Benita Susan Thomas |
| 122. | Indian Institute of Technology Delhi | M | Gopinadh Rongali |
| 123. | Maharana Pratap University of Agriculture and Technology | M | Lalruatkima |
| 124. | Central University of Jharkhand | M | Gaurav Tripathi |
| 125. | Central University of Jharkhand | M | Subhas Garai |
| 126. | Michigan State University | M | Arunav Nanda |
| 127. | IIT Guwahati | M | Antash Kishore Sinha |
| 128. | NITK Surathkal | M | Guguloth Praveen Kumar |
| 129. | Acharya Nagarjuna University | M | Matte Siva Teja |
| 130. | CSIR National Botanical Research Institute | M | Dr Anju Patel |
| 131. | IITG | M | Narayani Gogoi |
| 132. | Karnatak University Dharwad | M | Chetan Hanji |
| 133. | IIT Guwahati | M | Ajeet Rai |
| 134. | KIIT Deemed to be University | M | Dr. Rabindra Kumar Barik |
| 135. | SDM Institute of Technology Ujire Karnataka | M | Vishwanatha Bhat |
| 136. | Central University of Jharkhand | M | Gajendra Kumar |
| 137. | North Eastern Regional Institute of Science and Technology (NERIST) | M | Roona Singha |
| 138. | BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT | M | archanak@bmsit.in |
| 139. | INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI | M | Vijay Meena |
| 140. | IIT Guwahati | M | Sukhjeet Arora |
| 141. | Indian Institute of Technology Guwahati | M | Sandeep Kumar Mondal |
| 142. | KLE Technological University | M | Vinayak S Naikar |
| 143. | Manipal Institute of Technology, Manipal | F | Lathashri U A |
| 144. | Indian Institute of Technology, Guwahati | M | Vignesh P |
| 145. | IIT GUWAHATI | M | Mouly Bhowmick |
| 146. | The National institute of Engineering, Mysuru | M | Vasanth Kumar B M |
| 147. | Panjab University, Chandigarh | F | Ritambhara K. Upadhyay |

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| 148. | IIT Guwahati | F | Lasyamayee Lopamudra Sahoo |
| 149. | Department of Geoinformatics. Central University of Jharkhand, Ranchi | M | Swetabh Kamal Choudhary |
| 150. | NITK SURATHKAL | F | Pooja H Chabbi |
| 151. | National Institute of Technology Karnataka | M | Sufia Rehman |
| 152. | Indian Institute of Technology- Guwahati | M | Jayatu Kanta Bhuyan |
| 153. | Acharya N.G. Ranga Agricultural University | M | K. Krupavathi |
| 154. | St. Martin's Engineering College, Secunderabad | M | Dr. Jnana Ranjan Khuntia |
| 155. | Indian Institute of Technology Guwahati | F | Shreya Katre |
| 156. | IIT GUWAHATI | M | Modalavasa Suresh |
| 157. | IITG | M | Sumantra Chaudhuri |
| 158. | IIT GUWAHATI | M | Anupal Baruah |
| 159. | IIT Guwahati | M | Abhishek Dixit |
| 160. | Indian Institute of Technology, Guwahati | M | Dhritilekha Deka |
| 161. | Indian Institute of Technology Guwahati | M | Subhojit Jash |
| 162. | Goalpara College | M | Dr. Dhananjay Medhi |
| 163. | IIT Bombay | M | Akshay Kadu |
| 164. | Environmental Health and Safety Consultants Pvt Ltd | M | Basavaraj D B |
| 165. | Environmental Health & safety Pvt. Ltd., | F | Rajeshwari G |
| 166. | IITG | M | Diwakar M |
| 167. | NITA | M | Mekala Uday |

ANNEXURE II (C2)

SKILL DEVELOPMENT YEAR II

| Skill Development Year II | | | | | | | |
|---------------------------|--|-----|---|---------------------------------|--------------------------------|-----------------|---|
| Category | Organization | Sex | Participants | Start (dd/mm/yy) | End (dd/mm/yy) | Duration (Hrs.) | Remarks |
| Workshops | 1. IIT Guwahati | | Details of the 13 participants are given in Annexure II (C2): A | 25 th May 2022 | 27 th May 2022 | 16 hours | Online Workshop on Computer Aided Manufacturing through SolidCAM |
| | | | | | | | |
| | | | | | | | |
| Workshops | IITG and Assam Engineering College | | Details of the 8 participants are given in Annexure II (C2): B | 3 rd September 2022 | 4 th September 2022 | | Computer-Aided Design through Solidworks |
| Workshops | 2. IIT Guwahati | | Details of the 32 participants are given in Annexure II (C2): C | 10th October 2022 | 14th October 2022 | 30 hours | Underwater Welding |
| Training Programs | 1. IIT Guwahati | | Details of the 50 participants are given in Annexure II (C2): D | 14 th September 2022 | 30th September 2022 | | Condensed Course on Business Ecosystem for Entrepreneurs by IITG TIDF |
| Training Programs | 1. IIT Guwahati and Dept. of Water Resource, | | Details of the 18 participants are given in Annexure II (C2): E | 20th September 2022 | 21st September 2022 | | Training Program on River Bank Erosion Stabilization |

| | | | | | | |
|-------------------|---|---|--|-----------------------------|---------------------------------|--------------------------------|
| | Govt. of Meghalaya | | | | | |
| Training Programs | IIT Guwahati + YantraBot Pvt. Ltd. | Details of the 25 participants are given in Annexure II (C2): F | | 13 th June 2022 | 17 th June 2022 | Robotics for UW application |
| Training Programs | IIT Guwahati + IRS + Neel Diving Institute | | | 1 st August 2022 | 30 th September 2022 | UW diving and Welding Training |
| Conferences | 1. International Conference on River Corridor Research and Management | Female | | 30 th May 2022 | 1 st April 2022 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | Male | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | Total | | | | |
| | | Female | | | | |
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| | | Male | | | | |
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| | | | | | | |
| | | Total | | | | |

Annexure II (C2): A

Computer Aided Manufacturing through SolidCAM 25th -27th May 2022 (Prof. Sajan Kapil)

| Sl. No. | Participants Organization | Sex | Participants Names |
|---------|---------------------------|-----|-----------------------------------|
| 1. | IIT Guwahati | M | Utkarsh Rawat (M) |
| 2. | IIT Guwahati | M | Jaideep Singh Bhardwaj (M) |
| 3. | IIT Guwahati | M | Anil Kumar (M) |
| 4. | IIT Guwahati | F | Rubeka Idrishi (F) |
| 5. | IIT Guwahati | M | Avinash Chetry (M) |
| 6. | IIT Guwahati | M | Shivani Raj (M) |
| 7. | IIT Guwahati | M | Aniruddha Moon (M) |
| 8. | IIT Guwahati | M | Subhijit Jash (M) |
| 9. | IIT Guwahati | M | Aratricks Mondal (M) |
| 10. | IIT Guwahati | M | Akash Chowdhury (M) |
| 11. | IIT Guwahati | M | Vivek S Dond (M) |
| 12. | IIT Guwahati | M | Nikhil Gupta (M) |
| 13. | IIT Guwahati | M | Palbanjyoti Buragohain Phukan (M) |

Annexure II (C2): B

Computer-Aided Design through Solidworks 3rd -4th September 2022 (Prof. Sajan Kapil)

| Sl. No. | Participants Organization | Sex | Participants Names |
|---------|---------------------------|-----|------------------------|
| 1. | IIT Guwahati | M | Nunavath vasanth kumar |
| 2. | IIT Guwahati | M | Amit Kumar Rajak |
| 3. | IIT Guwahati | M | Ankit Kumar |
| 4. | IIT Guwahati | M | Ashish Kumar verma |
| 5. | Assam Engg. College | F | Basundhara Das |
| 6. | Assam Engg. College | F | Nishat Tasnim Ahmed |
| 7. | IIT Guwahati | F | Pragati Murathia |
| 8. | IIT Guwahati | F | T Lhingminchong Haokip |

Annexure II (C2): C

Underwater Welding 10th to 14th October 2022 (Prof. U. S. Dixit)

| Sl. No. | Participants Organization | Sex | Participants Names |
|---------|--|-----|------------------------|
| 1. | NIT, Manipur | M | Sunil Kumar |
| 2. | Dibrugarh Polytechnic | M | Ram Krishna Pathak |
| 3. | Easwari Engineering College | M | Sathiyamurthy |
| 4. | Easwari Engineering College, Chennai | M | ANANTHI. N |
| 5. | SRM UNIVERSITY, DELHI-NCR, SONIPAT | M | SHIWAKSHI |
| 6. | SRM University Delhi-NCR Sonapat | M | Aryan |
| 7. | National Institute of Advanced Manufacturing, Ranchi | M | Debashis Gonda |
| 8. | NATIONAL INSTITUTE OF TECHNOLOGY MANIPUR | M | Bokka Syam Babu |
| 9. | Indian Institute of Technology Guwahati | M | Prateek Patel |
| 10. | NIT Srinagar | M | Dinesh Kumar Rajendran |
| 11. | National Institute of Technology Silchar | M | Ashutosh padhan |
| 12. | Manipur Institute of Technology | M | Nilson |
| 13. | Manipur Institute of Technology | M | Soram Thomas Singh |
| 14. | GIRIJANANDA CHOWDHURY INSTITUTE OF MANAGEMENT AND TECHNOLOGY, GUWAHATI | M | AUNSHUMAN CHATTERJEE |
| 15. | Ramanujan Academy, Baihata Chariali | M | Shyaman Saloi |
| 16. | IIT Guwahati | M | Faladrum Sharma |
| 17. | IIT Guwahati | M | Kaustabh Chatterjee |
| 18. | IIT Guwahati | M | Nilkamal Mahanta |
| 19. | IIT Guwahati | M | Vivek Singh Yadav |
| 20. | Indian Institute of Technology Guwahati | F | Tanmoy Medhi |
| 21. | Indian Institute of Technology Guwahati | F | Pranav Dev Srivyas |
| 22. | IIT Guwahati | F | Bipul Brahma |
| 23. | IIT Guwahati | M | Nitish Bhardwaj |
| 24. | Indian Institute of Technology Guwahat | M | Bappa Das |
| 25. | Manipur Institute of technology | M | Tongbram Devajit Singh |
| 26. | MIT | M | Narayanan |
| 27. | IIT Guwahati | M | Bhanu Prakash Bonthala |
| 28. | National Institute of Technology Silchar | M | DEEPAK KUMAR SHARMA |

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| | | | |
|-----|--|---|--------------------|
| 29. | Indian Institute of Technology Guwahati | M | Ayush Sahu |
| 30. | IIT INDORE | M | VIPIN GOYAL |
| 31. | Durgapur Institute of Advanced Technology and Management (DIATM) | M | SWARUP GARAI |
| 32. | Tezpur University | M | Debojit Buragohain |

Annexure II (C2): D

**Condensed Course on Business Ecosystem for Entrepreneurs by IITG TIDF 14th to 30th September 2022
(Mr. Partha Pratim Dasgupta)**

| Sl. No. | Participants Organization | Sex | Participants Names |
|---------|---|-----|----------------------------|
| 1. | Chemical Engineering, IIT Guwahati | M | PARVEZ ALAM |
| 2. | EEE, IIT Guwahati | M | Bhim Singh |
| 3. | SART, IIT Guwahati | M | Gopi Krishna S |
| 4. | ME, IIT Guwahati | M | kanak jindal |
| 5. | Civil, IIT Guwahati | F | Naveen Kumar |
| 6. | Chemical Engineering, IIT Guwahati | F | MANOJ KUMAR DHAL |
| 7. | Unnat Bharat Abhiyan Cell, IIT Guwahati | F | Gaurishankar Bhattacharyya |
| 8. | CICPS IIT Guwahati | M | Amit Pareek |
| 9. | CICPS IIT Guwahati | M | Ashish Kumar Soni |
| 10. | CICPS IIT Guwahati | M | Keyur Anil Sangwai |
| 11. | CICPS IIT Guwahati | M | Perumalla Rithin Vamshi |
| 12. | CICPS IIT Guwahati | M | Soumik Pramanik |
| 13. | CICPS IIT Guwahati | M | Tara Chand |
| 14. | CICPS IIT Guwahati | M | V Ganesh Rama Krishna Raju |
| 15. | CICPS IIT Guwahati | M | Vignesh P |
| 16. | CICPS IIT Guwahati | M | Saba Zaidi |
| 17. | CICPS IIT Guwahati | M | Adarsh PatidarAdarsh |
| 18. | CICPS IIT Guwahati | M | Pratiush Anand |
| 19. | CICPS IIT Guwahati | M | Konduru Vijay |
| 20. | CICPS IIT Guwahati | M | Mayank Mishra |
| 21. | CICPS IIT Guwahati | M | Alok Kumar Trivedi |
| 22. | CICPS IIT Guwahati | M | SIDDARTH GAUTAM |
| 23. | CICPS IIT Guwahati | M | Vinay Kumar |
| 24. | CICPS IIT Guwahati | M | Ashwinee Narware |
| 25. | CICPS IIT Guwahati | M | RASHIK KALITA |
| 26. | CICPS IIT Guwahati | M | Tarang Kamble |
| 27. | CICPS IIT Guwahati | F | Syed Bustan Fatima Warsi |
| 28. | CICPS IIT Guwahati | F | Pranjali Singh |

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| | | | |
|-----|---------------------------|---|------------------------|
| 29. | CICPS IIT Guwahati | F | Antara Sarkar |
| 30. | CICPS IIT Guwahati | M | Ajeet Rai |
| 31. | CICPS IIT Guwahati | M | Dodda Srinivas |
| 32. | CICPS IIT Guwahati | M | Praveen Chauhan |
| 33. | CICPS IIT Guwahati | M | Deep Arya |
| 34. | CICPS IIT Guwahati | M | Suraj Kumar |
| 35. | CICPS IIT Guwahati | M | Bhanu Prakash Bonthala |
| 36. | CICPS IIT Guwahati | M | Shrihari A |
| 37. | CICPS IIT Guwahati | M | Sahil Narwal |
| 38. | CICPS IIT Guwahati | M | Subhojit Jash |
| 39. | CICPS IIT Guwahati | M | Shyamal Mishra |
| 40. | CICPS IIT Guwahati | M | Souradip Pal |
| 41. | CICPS IIT Guwahati | M | Udit Sharma |
| 42. | CICPS IIT Guwahati | M | Mouly Bhowmick |
| 43. | IIT Guwahati TIDF | M | Ashish Mahato |
| 44. | IIT Guwahati TIDF | M | Om Kumar |
| 45. | IIT Guwahati TIDF | M | Vikash Yadav |
| 46. | IIT Guwahati TIDF | M | Ashish Kumar Singh |
| 47. | IIT Guwahati TIDF | M | Alok Negi |
| 48. | IIT Guwahati TIDF | M | Nikhil Choudhry |
| 49. | IIT Guwahati TIDF | M | Rajan Gupta |
| 50. | Dept. Design IIT Guwahati | F | Reni Varghese |

Annexure II (C2): E

Training Program on River Bank Erosion Stabilization during 20th-21st September 2022 (Prof. S Dutta)

| Sl. No | Name | Designation |
|--------|---------------------------|--|
| 1. | Ms. Junecy F. Lyngdoh | Superintending Engineer (HPD), Shillong |
| 2. | Mr. Carlden E. Wahlang | Executive Engineer (HI), Shillong |
| 3. | Mr. Christopher Kharmujai | Executive Engineer (PD), Shillong |
| 4. | Mr. Pradip K. Hajong | Executive Engineer (WR), Williamnagar |
| 5. | Mr. Renos R. Lyngskor | Executive Engineer (WR), Khliehriat |
| 6. | Ms. Lily S. Momin | Sub Divisional Officer (WR), Barengapara |
| 7. | Ms. Sainara Mawlong | Sub Divisional Officer (HI), Shillong |
| 8. | Mr. Karikor Kharkongor | Assistant Engineer (WR), Shillong |
| 9. | Mr. Samborlang Thubru | Assistant Engineer MeWDA, Baghmara |
| 10. | Mr. Teibor Marwein | Junior Engineer (WR), Shillong |
| 11. | Mr. Bilcheng K. Marak | Junior Engineer (WR), Phulbari |
| 12. | Mr. Staymore M. Marak | Junior Engineer (WR), Phulbari |
| 13. | Mr. Aibingstone Areng | Junior Engineer (WR), Tura |
| 14. | Mr. Chenang I. Sangma | Junior Engineer (WR), Williamnagar |
| 15. | Mr. Barnawel D. Shira | Junior Engineer (WR), Resubelpara |
| 16. | Mr. Frankie Biam | Program Associate MeWDA, Resubelpara |
| 17. | Mr. Silseng D. Sangma | Junior Engineer MeWDA, Baghmara |
| 18. | Mr. Prewilstar Sangma | Junior Engineer MeWDA, Baghmara |

Annexure II (C2): F

Robotics for UW application during 13th to 17th June 2022 (Prof. B. S. Reddy + Yantrobot Tech. Pvt. Ltd.)

| Sl. No. | Participants Organization | Sex | Participants Names |
|---------|---------------------------|-----|---------------------------|
| 1. | CICPS IIT Guwahati | M | Abhishek Tripathi |
| 2. | CICPS IIT Guwahati | M | Aman Gupta |
| 3. | CICPS IIT Guwahati | M | Ashish Kumar |
| 4. | CICPS IIT Guwahati | M | Atul Bhagat |
| 5. | CICPS IIT Guwahati | M | Chivukula Sairam Satwik |
| 6. | CICPS IIT Guwahati | M | Hariansh Sehgal |
| 7. | CICPS IIT Guwahati | M | Mukesh Chahar |
| 8. | CICPS IIT Guwahati | M | Raj Hanmant Katkar |
| 9. | CICPS IIT Guwahati | F | Sai Priya Karnati |
| 10. | CICPS IIT Guwahati | M | Sanjeet Bara |
| 11. | CICPS IIT Guwahati | M | Sukanta Ghatak |
| 12. | CICPS IIT Guwahati | M | Suman Kumar |
| 13. | CICPS IIT Guwahati | M | Vaibhav Ishwar Gavit |
| 14. | CICPS IIT Guwahati | M | Aniket Gajanan Zope |
| 15. | CICPS IIT Guwahati | M | Ashish Giri Goswami |
| 16. | CICPS IIT Guwahati | M | Gyan Ratna |
| 17. | CICPS IIT Guwahati | M | P V Rohith Kumar |
| 18. | CICPS IIT Guwahati | M | Pranjal Bhawasar |
| 19. | CICPS IIT Guwahati | M | Raju Krishna Sharma |
| 20. | CICPS IIT Guwahati | M | Sushant Suresh Pargaonkar |
| 21. | CICPS IIT Guwahati | M | Sahil Narwal |
| 22. | CICPS IIT Guwahati | M | Antara Sarkar |
| 23. | CICPS IIT Guwahati | F | Souradip Pal |
| 24. | CICPS IIT Guwahati | M | Udit Sharma |
| 25. | Dept. of ME IIT Guwahati | F | Shivani Raj |

ANNEXURE II (C3)

SKILL DEVELOPMENT YEAR III

| Skill Development Year III | | | | | | | |
|----------------------------|--------------|--------|--------------|----------------------|--------------------|--------------------|---------|
| Category | Organization | Sex | Participants | Start (dd/mm//yy) | End (dd/mm//yy) | Duration (Hrs.) | Remarks |
| Workshops | | Female | | | | | |
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| | | | | | | | |
| | | Male | | | | | |
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| | | Total | | | | | |
| Training Programs | | Female | | | | | |
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| | | Male | | | | | |
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| | | Total | | | | | |
| Conferences | | Female | | | | | |
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| | | Male | | | | | |
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| | | Total | | | | | |
| Others | | Female | | | | | |
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| | | Male | | | | | |
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| | | Total | | | | | |

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| | | Total | | | | | |
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ANNEXURE II (D1)

ANY SPECIFIC INITIATIVES YEAR I

| Any Specific Initiatives Year I | | | | | | | |
|---------------------------------|--------------|--------|--------------|----------------------|--------------------|--------------------|---------|
| Category | Organization | Sex | Participants | Start (dd/mm//yy) | End (dd/mm//yy) | Duration (Hrs.) | Remarks |
| | | Female | | | | | |
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| | | Male | | | | | |
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| | | Total | | | | | |

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| | | Total | | | | | |
|--|--|-------|--|--|--|--|--|

ANNEXURE II (D2)

ANY SPECIFIC INITIATIVES YEAR II

| Any Specific Initiatives Year II | | | | | | | |
|----------------------------------|--------------|--------|--------------|----------------------|--------------------|--------------------|---------|
| Category | Organization | Sex | Participants | Start (dd/mm//yy) | End (dd/mm//yy) | Duration (Hrs.) | Remarks |
| | | Female | | | | | |
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| | | | | | | | |
| | | Male | | | | | |
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| | | Total | | | | | |
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ANNEXURE II (D3)

ANY SPECIFIC INITIATIVES YEAR III

| Any Specific Initiatives Year III | | | | | | | |
|-----------------------------------|--------------|--------|--------------|----------------------|--------------------|--------------------|---------|
| Category | Organization | Sex | Participants | Start (dd/mm//yy) | End (dd/mm//yy) | Duration (Hrs.) | Remarks |
| | | Female | | | | | |
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| | | Male | | | | | |
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| | | Total | | | | | |
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ANNEXURE III (A1)

START-UPS DETAILS YEAR I (NATIONAL)

| Total No. of Start-ups Year I | | | | | | |
|-------------------------------|---|----------|----------------|-------------------|-----------------|--------------------|
| Name of the Company | Area | Reg. No. | Funding Source | Start (dd/mm//yy) | End (dd/mm//yy) | Ongoing/ Completed |
| AvGarde Systems Pvt. Ltd. | Underwater Communication Systems | SRT01 | SeedFund | 31-03-2022 | 30-03-2023 | Ongoing |
| BIOZATRA Pvt. Ltd. | Underwater Monitoring Systems for Aquaculture | SRT02 | SeedFund | 31-03-2022 | 30-03-2023 | Ongoing |
| Yantrabot Tech. Pvt. Ltd | Development of Underwater Actuators | SRT03 | SeedFund | 31-03-2022 | 30-03-2023 | Ongoing |

ANNEXURE III (A2)

START-UPS DETAILS YEAR II (NATIONAL)

[illegible]

ANNEXURE III (A3)

START-UPS DETAILS YEAR III (NATIONAL)

[illegible]

ANNEXURE III (B1)

START-UPS DETAILS YEAR I (INTERNATIONAL)

[illegible]

ANNEXURE III (B2)

START-UPS DETAILS YEAR II (INTERNATIONAL)

[illegible]

ANNEXURE III (B3)

START-UPS DETAILS YEAR III (INTERNATIONAL)

[illegible]

ANNEXURE III (C1)

GCC YEAR I

| Grand Challenges & Competitions Year I | | | | | | | |
|--|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (C2)

GCC YEAR II

| Grand Challenges & Competitions Year II | | | | | | | |
|---|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (C3)

GCC YEAR III

| Grand Challenges & Competitions Year III | | | | | | | |
|--|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (D1)

PRAYAS YEAR I

| Promotion and Acceleration of Young and Aspiring Technology Entrepreneurs Year I | | | | | | | |
|--|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (D2)

PRAYAS YEAR II

| Promotion and Acceleration of Young and Aspiring Technology Entrepreneurs Year II | | | | | | | |
|---|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (D3)

PRAYAS YEAR III

| Promotion and Acceleration of Young and Aspiring Technology Entrepreneurs Year III | | | | | | | |
|--|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (E1)

EIR YEAR I

| CPS-Entrepreneur In Residence Year I | | | | | | | |
|--------------------------------------|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (E2)

EIR YEAR II

| CPS-Entrepreneur In Residence Year II | | | | | | | |
|---------------------------------------|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (E3)**EIR YEAR III**

| CPS-Entrepreneur In Residence Year III | | | | | | | |
|---|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (F1)

DIAL YEAR I

| Dedicated Innovation Accelerator Year I | | | | | | | |
|---|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (F2)**DIAL YEAR II**

| Dedicated Innovation Accelerator Year II | | | | | | | |
|---|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (F3)

DIAL YEAR III

| Dedicated Innovation Accelerator Year III | | | | | | | |
|---|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (G1)

CPS-SSS YEAR I

| CPS-Seed Support System Year I | | | | | | | |
|--------------------------------|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (G2)

CPS-SSS YEAR II

| CPS-Seed Support System Year II | | | | | | | |
|---------------------------------|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (G3)

CPS-SSS YEAR III

| CPS-Seed Support System Year III | | | | | | | |
|----------------------------------|----------|----------|-------|-----|--------|-------------------|--------|
| Category | Enrolled | Selected | Start | End | Sector | Funding Resources | Equity |
| Female | | | | | | | |
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ANNEXURE III (H1)

JOBS CREATION YEAR I

| Jobs Detail Year I | | | | | | |
|--------------------|---------------------|----------------------------|-------|----------------------|--------------------|-----------------|
| Category | Name | Designation | Area | Start (dd/mm//yy) | End (dd/mm//yy) | Salary (Rs.) |
| Female | Garima Agrawal | Assistant Project Engineer | UWE | 01-04-2021 | 31-03-2022 | 28000+HRA |
| | Iba Parveen | JRF | UWE | 01-04-2021 | 31-03-2022 | 15000+HRA |
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| Male | Arijit Dey | Associate Project Engineer | UWE | 01-04-2021 | 31-03-2022 | 35000+HRA |
| | Sibananda Mohanty | Associate Project Engineer | UWE | 01-04-2021 | 31-03-2022 | 35000+HRA |
| | Ashish Kumar Singh | Associate Project Engineer | UWE | 01-04-2021 | 31-03-2022 | 35000+HRA |
| | Nikhil K. Choudhary | Assistant Project Engineer | UWE | 01-04-2021 | 31-03-2022 | 28000+HRA |
| | Arurag Tiwari | Assistant Project Engineer | UWE | 01-04-2021 | 31-03-2022 | 28000+HRA |
| | Bhaves S Chaudhari | Assistant Project Engineer | UWE | 01-04-2021 | 31-03-2022 | 28000+HRA |
| | Ashish K. Mahato | Project Technician | UWE | 01-04-2021 | 31-03-2022 | 15000+HRA |
| | Rajan Gupta | Project Technician | UWE | 01-04-2021 | 31-03-2022 | 15000+HRA |
| | Om Kumar | Project Technician | UWE | 01-04-2021 | 31-03-2022 | 15000+HRA |
| | Shivakumar | Associate Project Engineer | UWE | 01-04-2021 | 31-03-2022 | 35000+HRA |
| | Bitan Maiti | Project Technician | UWE | 01-04-2021 | 31-03-2022 | 15000+HRA |
| | Sachit N. Pandey | Project Technician | UWE | 08-03-2022 | 08-06-2022 | 15000+HRA |
| | Alok Negi | JRF | UWE | 05-04-2021 | 31-03-2022 | 15000+HRA |
| | Vikas Yadav | JRF | UWE | 07-04-2021 | 31-03-2022 | 15000+HRA |
| | Vishesh Singh | JRF | UWE | 01-04-2021 | 26-07-2021 | 15000+HRA |
| | M.Diwakar | JRF | UWE | 01-04-2021 | 31-03-2022 | 15000+HRA |
| | Ashim Das | Admin. Assistant, | Acct. | 01-04-2021 | 31-03-2022 | 15000+HRA |
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| | | | | | | |
| Total | 19 | | | | | |

ANNEXURE III (H2)

JOBS CREATION YEAR II

| Jobs Detail Year II | | | | | | |
|---------------------|---------------------|----------------------------|-------|----------------------|--------------------|-----------------|
| Category | Name | Designation | Area | Start (dd/mm//yy) | End (dd/mm//yy) | Salary (Rs.) |
| Female | Garima Agrawal | Assistant Project Engineer | UWE | 01-04-2022 | 02-09-2022 | 28000+HRA |
| | Iba Parveen | JRF | UWE | 01-04-2022 | 10-09-2022 | 15000+HRA |
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| | | | | | | |
| Male | Arijit Dey | Associate Project Engineer | UWE | 01-04-2022 | Cont... | 35000+HRA |
| | Sibananda Mohanty | Associate Project Engineer | UWE | 01-04-2022 | Cont... | 35000+HRA |
| | Ashish Kumar Singh | Associate Project Engineer | UWE | 01-04-2022 | Cont... | 35000+HRA |
| | Nikhil K. Choudhary | Assistant Project Engineer | UWE | 01-04-2022 | Cont... | 28000+HRA |
| | Arurag Tiwari | Assistant Project Engineer | UWE | 01-04-2022 | Cont... | 28000+HRA |
| | Ashish K. Mahato | Project Technician | UWE | 01-04-2022 | Cont... | 15000+HRA |
| | Rajan Gupta | Project Technician | UWE | 01-04-2022 | Cont... | 15000+HRA |
| | Om Kumar | Project Technician | UWE | 01-04-2022 | Cont... | 15000+HRA |
| | Shivakumar | Associate Project Engineer | UWE | 01-04-2022 | Cont... | 35000+HRA |
| | Bitan Maiti | Project Technician | UWE | 01-04-2022 | | 15000+HRA |
| | Sachit N. Pandey | Project Technician | UWE | 01-04-2022 | Cont... | 15000+HRA |
| | Alok Negi | JRF | UWE | 01-04-2022 | Cont... | 15000+HRA |
| | Vikas Yadav | JRF | UWE | 01-04-2022 | Cont... | 15000+HRA |
| | M.Diwakar | JRF | UWE | 01-04-2022 | Cont... | 15000+HRA |
| | Ashim Das | Admin. Assistant, | Acct. | 01-04-2022 | Cont... | 15000+HRA |
| | Labourer | - | | 06-04-2022 | Cont... | - |
| | CSIR-NBRI Lucknow | Maintenance Engineer | Eng. | 06-04-2022 | Cont... | - |
| | | | | | | |
| | | | | | | |
| Total | 17+23=40 | | | | | |

ANNEXURE III (H3)

JOBS CREATION YEAR III

| Jobs Detail Year III | | | | | | |
|----------------------|------|-------------|------|----------------------|--------------------|-----------------|
| Category | Name | Designation | Area | Start (dd/mm//yy) | End (dd/mm//yy) | Salary (Rs.) |
| Female | | | | | | |
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| Male | | | | | | |
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| Total | | | | | | |

ANNEXURE III (I1)

NO. OF TECHNOLOGY PARKS, CoEs, OTHERS YEAR I

| No. of Technology Parks, CoEs, Others Year I | | | | | | | | |
|--|------------|-------|----------|-------|-------|-----|-----------------------|--------------|
| Purpose/ Area | Investment | | | | Start | End | Ongoing/ Completed | Achievements |
| | DST | State | Industry | Other | | | | |
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ANNEXURE III (I2)

NO. OF TECHNOLOGY PARKS, CoEs, OTHERS YEAR II

| No. of Technology Parks, CoEs, Others Year II | | | | | | | | |
|---|------------|-------|----------|-------|-------|-----|-----------------------|--------------|
| Purpose/ Area | Investment | | | | Start | End | Ongoing/ Completed | Achievements |
| | DST | State | Industry | Other | | | | |
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ANNEXURE III (I3)

NO. OF TECHNOLOGY PARKS, CoEs, OTHERS YEAR III[illegible]

ANNEXURE IV (A1)

ACADEMIC INSTITUTIONS YEAR I

| Academic Institutions Year I | | | | | | | |
|------------------------------------|-----------------------------------|-----------------|-----------------------|-------|-----|-----------------------|--------------|
| Domestic | | | Inter natio nal | Start | End | Ongoing/ Completed | Achievements |
| State | Central | Pri vat e | | | | | |
| VSSUT Burla, Odisha | NIT Silchar, Assam | | | | | Ongoing | |
| OUTR Bhubane swar, Odisha | NIT Mizoram, Mizoram | | | | | Ongoing | |
| | NIT Rourkela, Odisha | | | | | Ongoing | |
| | NIT Calicut, Kerala | | | | | Ongoing | |
| | NIT Arunachal Pradesh | | | | | Ongoing | |
| | IIT Roorkee | | | | | Ongoing | |
| | IIT Jodhpur | | | | | Ongoing | |
| | IIT Indore | | | | | Ongoing | |
| | IIT Goa | | | | | Ongoing | |
| | IIT Delhi | | | | | Ongoing | |
| | CMERI Durgapur, West Bengal | | | | | Ongoing | |
| | NIOT | | | | | Ongoing | |
| | Indian Register for Shipping | | | | | Ongoing | |
| | | | | | | | |

ANNEXURE IV (A2)

ACADEMIC INSTITUTIONS YEAR II

| Academic Institutions Year II | | | | | | | |
|-------------------------------|--------------------------------|---------|---------------|-------|-----|-----------------------|--------------|
| State | Domestic | | International | Start | End | Ongoing/ Completed | Achievements |
| | Central | Private | | | | | |
| | IIT Palakkad, Kerala | | | | | Ongoing | |
| | IIIT Guwahati, Assam | | | | | Ongoing | |
| | NIT Meghalaya, Meghalaya | | | | | Ongoing | |
| | NIT Warangal | | | | | Ongoing | |
| | DIT Pune | | | | | Ongoing | |
| | ICAR-CIFRI, Kolkata | | | | | Ongoing | |
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ANNEXURE IV (A3)

ACADEMIC INSTITUTIONS YEAR III

[illegible]

ANNEXURE IV (B1)

BUSINESS ENTERPRISES YEAR I

[illegible]

ANNEXURE IV (B2)

BUSINESS ENTERPRISES YEAR II

| Business Enterprises Year II | | | | | | | |
|-------------------------------------|---------------------|------------|---------|-------|-----|--------------------|--------------|
| Types of Engagements | Product Development | Incubation | Funding | Start | End | Ongoing/ Completed | Achievements |
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ANNEXURE IV (B3)

BUSINESS ENTERPRISES YEAR III

| Business Enterprises Year III | | | | | | | |
|--------------------------------------|---------------------|------------|---------|-------|-----|--------------------|--------------|
| Types of Engagements | Product Development | Incubation | Funding | Start | End | Ongoing/ Completed | Achievements |
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ANNEXURE IV (C1)

NGOs YEAR I

[illegible]

ANNEXURE IV (C2)

NGOs YEAR II

[illegible]

ANNEXURE IV (C3)

NGOs YEAR III

[illegible]

ANNEXURE IV (D1)

OTHERS YEAR I

| Others Year I | | | | |
|---------------|---------|---------------------|-------------------|--------|
| Name | Funding | Start (dd/mm/yy) | End (dd/mm/yy) | Remark |
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ANNEXURE IV (D2)

OTHERS YEAR II

| Others Year II | | | | |
|----------------|---------|---------------------|-------------------|--------|
| Name | Funding | Start (dd/mm/yy) | End (dd/mm/yy) | Remark |
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ANNEXURE IV (D3)

OTHERS YEAR III

| Others Year III | | | | |
|-----------------|---------|---------------------|-------------------|--------|
| Name | Funding | Start (dd/mm/yy) | End (dd/mm/yy) | Remark |
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