



Heritage Institute of Technology

(An Autonomous Institution)

**Collaborative activities for research/
faculty exchange/student
exchange/internship/on-the-job
training/project work**

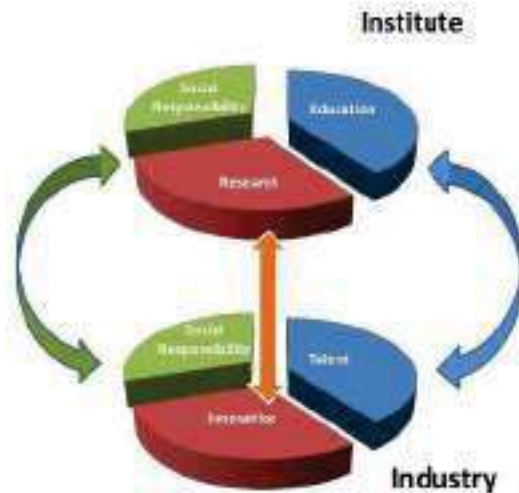


&



Industry Academia Research Collaboration

A research Initiative with **Productization** Goal



- A Product Development Project under prestigious **India Chip Program** (A **Make in India** Initiative) by HITK in collaboration with eCOE (Electronics Center of Excellence) supported by **ESSCI, Skill India** and **IESA**.
- This is a project by **eCOE** under **Indo-US** joint project scheme. **HITK** is academic Partner of **eCOE** (HITK signed MOU with eCOE in 2018)
- HITK ECE Team has developed a **32Kb Memory Module IP** for Mercury2 Micro-Chip @ 65nm Process Node in Collaboration with eCOE
- Mercury2 Micro-Chip is a **SOC** (System on Chip) **IOT** solution for smart sensing at Edge or Fog computing in Indian environment for real time environment monitoring system.
- This Micro-Chip will be manufactured by a leading foundry in the world today using one of Latest Process Node (**65nm**) for Mixed Signal Products (Analog and Digital)

- **Project Lead** : Prof. Krishanu Datta, Associate Professor, ECE

- **Team Members:**

- Prajjol Kumar Mitra (ECE B.Tech 4th Year)
- Subhajit Mondal (ECE B.Tech 4th Year)
- Shubhang Pandey (ECE B.Tech 4th Year)
- Sounak De (ECE B.Tech 4th Year)
- Priyankar Sarkar (ECE B.Tech 4th Year)
- Shivendra Narayan Sinha (ECE B.Tech 4th Year)
- Riju Mukherjee (ECE B.Tech 4th Year)
- Nikita Paul (ECE M.Tech VLSI 2nd Year)

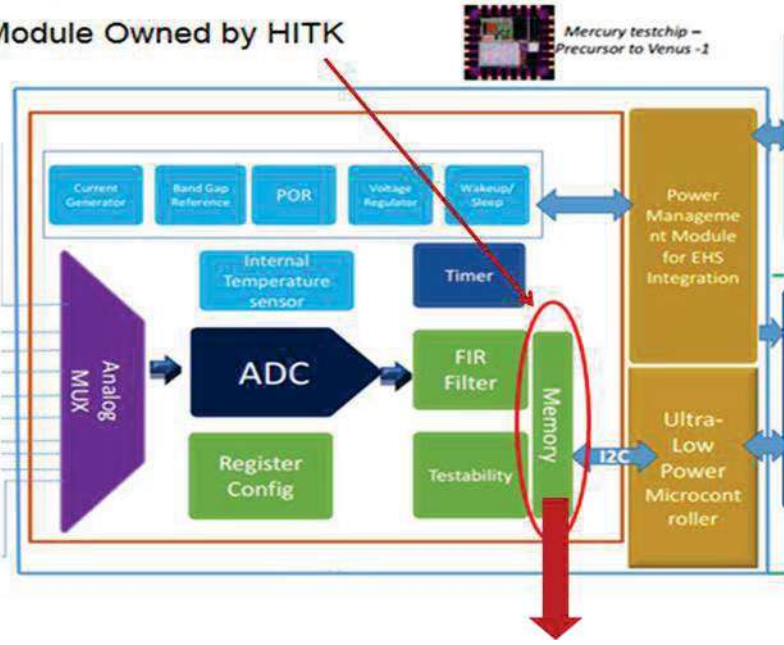


- **Project Phase/Site**

- **Phase1:** Methodology Development: HITK ECE VLSI LAB (ICT602)
 - Functional Verification: **Done**
 - Circuit Topology: **Done**
 - Critical Path Modeling for Timing & Power: **Done**
 - Bit-cell Characterization and Margin Analysis: **Done**
 - Bit-cell Array Layout Study & Finalization of Floor-plan: **Done**
- **Phase2:** Execution and Convergence: eCOE Center, Bhubaneswar
 - Functional Verification: **Done**
 - Bit-cell Characterization and Margin Analysis: **Done**
 - Bit-cell Array & Decoder Layout: **Done**
 - Timing & Power Verification/convergence: **Done**
 - I/O Slice Layout and Complete Memory Layout: **Done**

InChiP – India Chip Program
 Architectural Picture of Mercury2 Micro-Chip

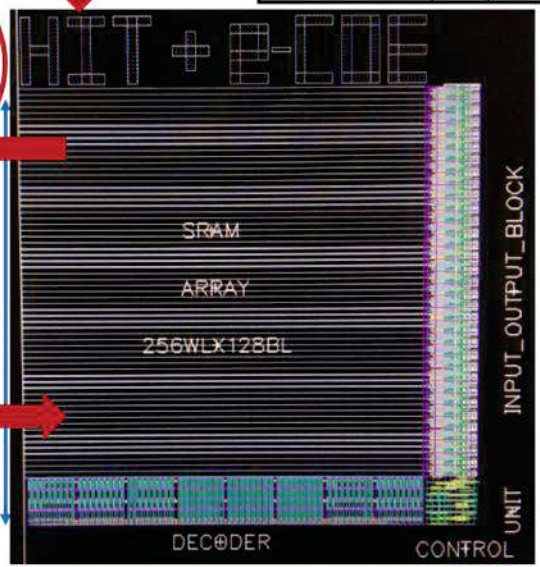
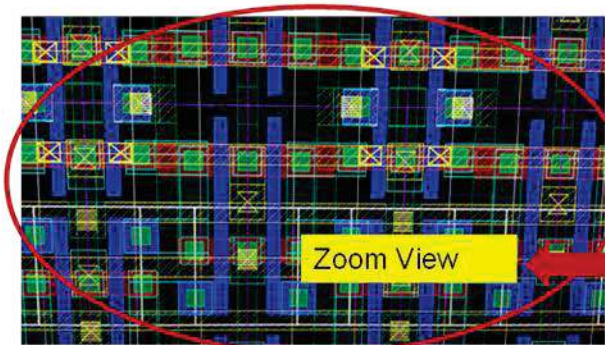
Memory Module Owned by HITK



32 Kb Memory Module Design by HITK inside Mercury2
 Micro-Chip – Using 65nm Process

HIT Logo inside Micro-Chip (Metal4 is used)

Array	L/I/O	G/I/O
<u>Floorplan</u>		
Decoder	LC	GC



Memory Module Contains **almost Quarter Million** Physical Transistors in 248um x 235um Silicon Area

235um

248um

- What HITK Team has achieved?
 - HITK ECE Team has completed the Development Project before schedule.
 - HITK ECE Team has satisfied Industry Standard Design Criteria (Power, Performance, and Area) using one of latest Technology (**65nm**) for mixed signal product (Analog + Digital) to be manufactured by a **leading foundry** in the world today!!
 - HITK ECE Team has developed 32Kb Memory Module IP having almost **Quarter Million Physical Transistor** in only **248um x 235um Si** area.
 - This scale of integration and density is going to be **1st time by any Engineering College in India.**

Design Review in Electronics Center of Excellence



Product Development by HITK and eCOE a Collaborative Effort

India Chip Program (InChiP)

InChiP – India Chip Program

Architectural Picture of Mercury2 Test Chip

Owned by HITK



Mercury testchip – Precursor to Venus -1

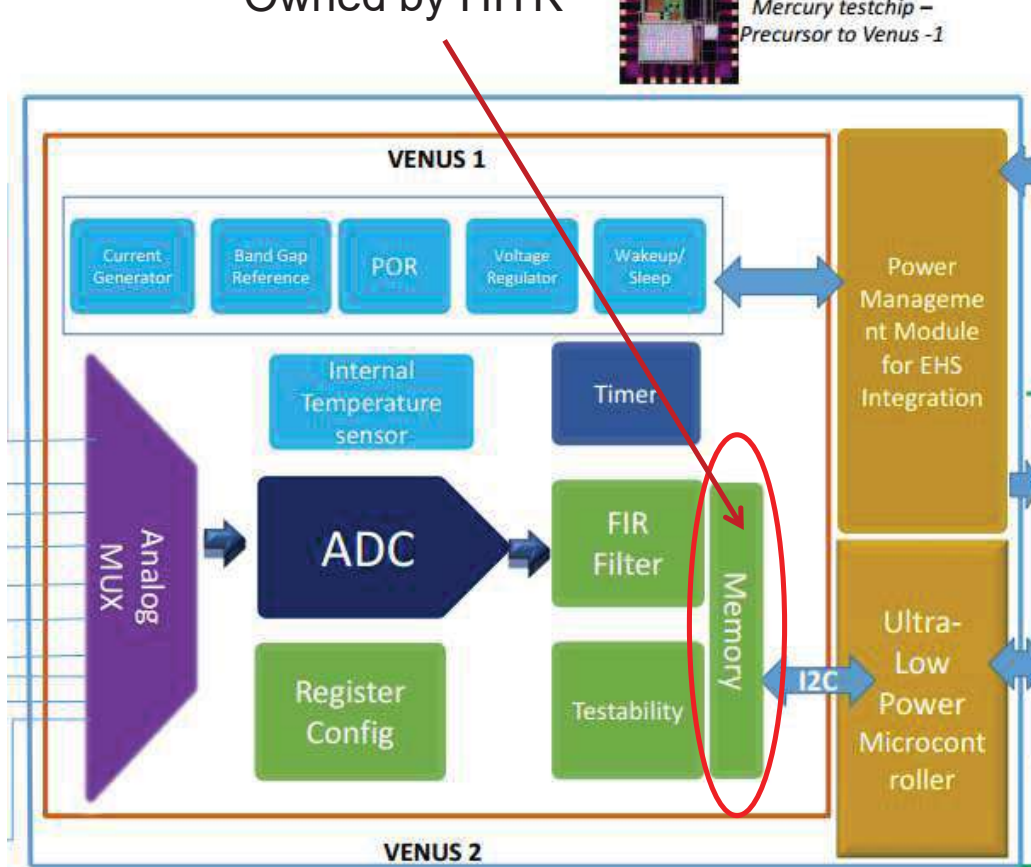
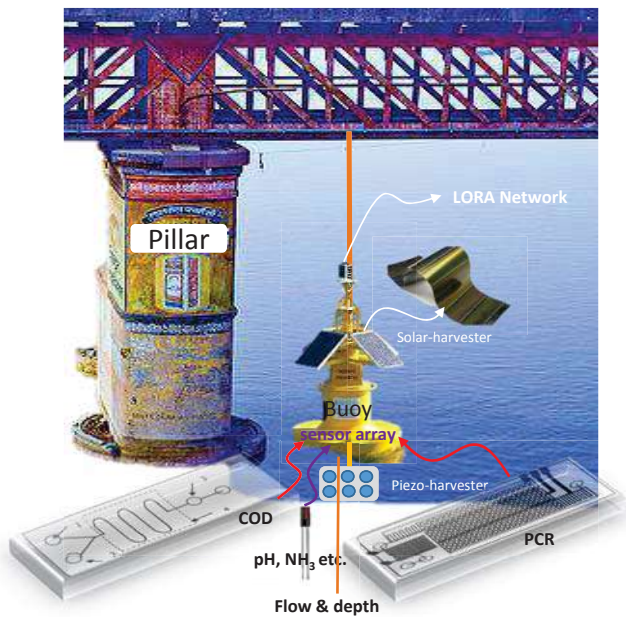


Figure: 1 High Level Planning for Mercury2 Test Chip is shown where the Memory Block as owned by HITK is 32Kb (1K entry x 32 bits) and will interface with a Micro-controller.

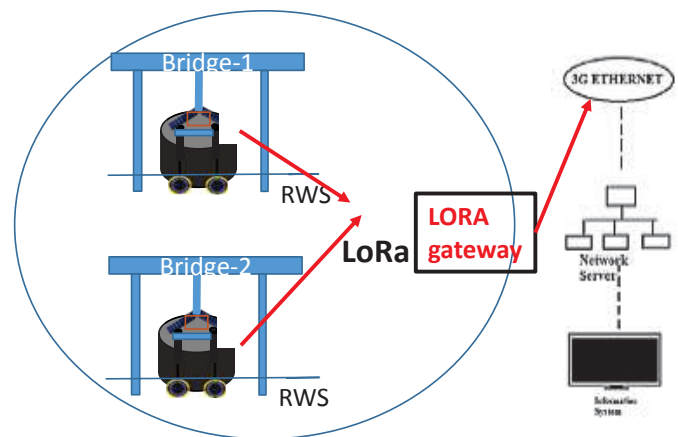
Integrated low cost water sensors for real-time river water monitoring and decision-making (“SensorWarn”)

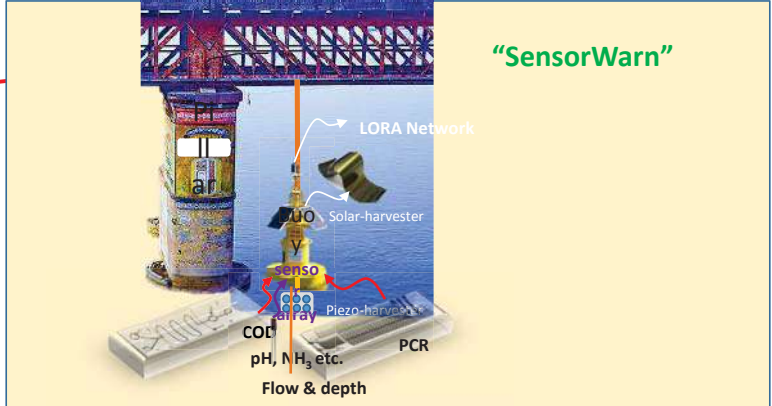


Team: IIT D; NISTB; UH; NEERI;

MSU; Stanford; UCR; NJIT

Email: (arunku@civil.iitd.ac.in)





Floating Buoy with Sensors, Energy Harvesting Systems and Integrated ASIC Chip

Sites:

Yamuna river;
IIT Delhi drain

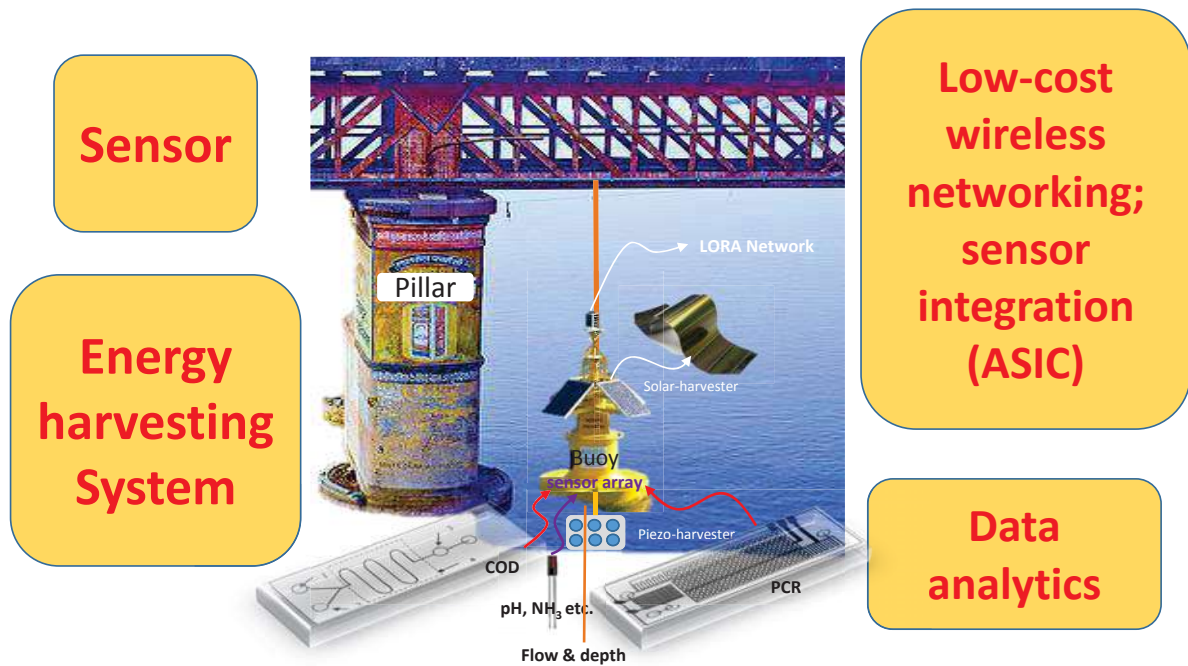
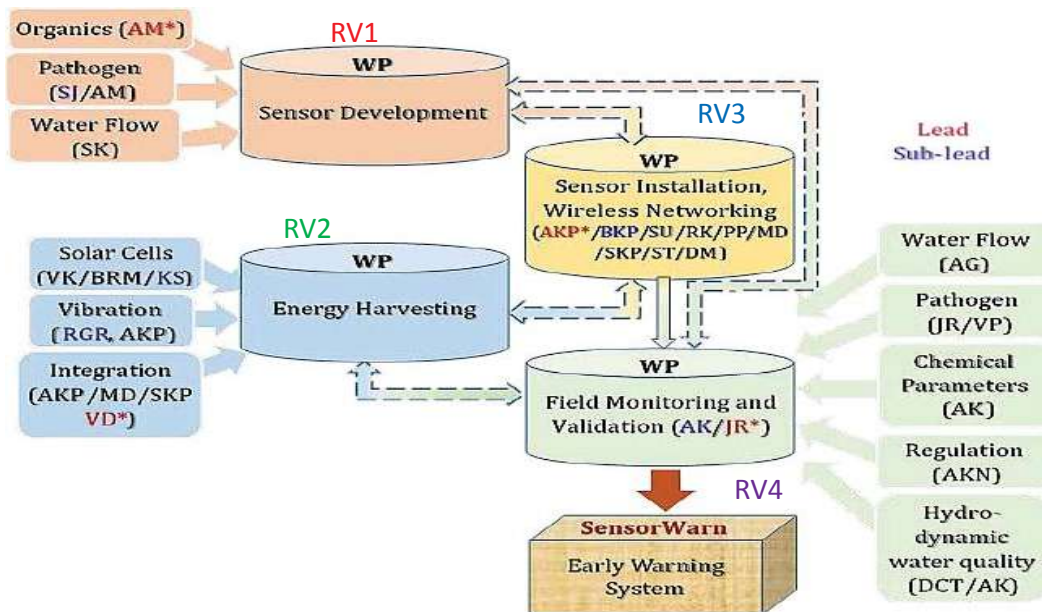


Fig.1

Approach



Schematic showing interconnectedness of different tasks of the proposal

(AM: A.Mulchandani, UC Riverside, USA; KS-K. Saraswat, Stanford Univ. USA; JR-J. Rose, MSU, USA; DM: Durgamadhab Misra; BR-B Rajendran, NJIT)
 (SJ: S.Jha, IITD; SK: S. Kar, IITD; VK: V. Komarala, IITD,India;BRM: Mehta, IITD; VRGR: V.Ramgopal Rao, IITD; VD: V Dutta, IITD; BKP: B K Panigrahi, IITD;
 SU: S. Udgata, Univ. Hyderabad. ,India; PP: P. Prasad, NEERI India; ST: S.Tandon, NEERI India;RK-R. Kumar, NEERI, India; AK: A. Kumar, IITD; AG-A K Gosain,
 IITD; VP:V. Perumal, IITD; AKN-AK Nema, IITD; DCT: Dhanya CT, IITD; AKP: Ajit Kumar Panda; MD: Mrinal Das; SKP: Santosh Kumar Patnaik)

2. Partners/Management Mechanisms

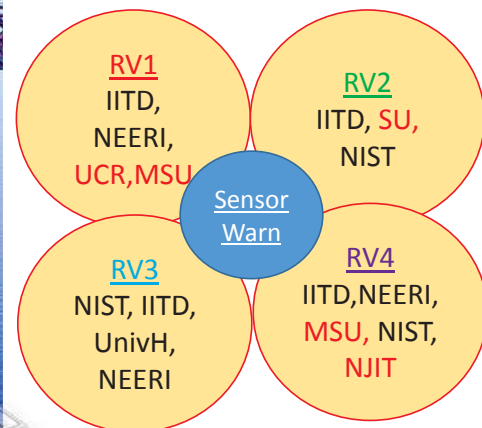
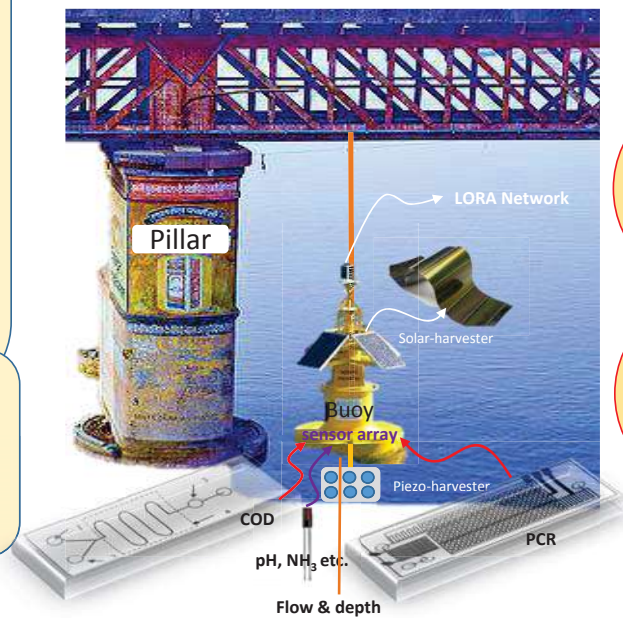
IIT D(12); NISTB(8); UH(1);
NEERI(3);MSU(1);
Stanford(1); UCR(1); NJIT(2)

India

IIT Delhi: AKumar, SJha, VRG Rao,
 AKGosain,AKNema, CTDhanya,
 VKKomaral, VDutta, SKar,
 BKPanigrahi, BRMehta, Vperumal
NEERI: PPrasad, STandon, RKumar
Univ. Hyderabad: SKUdgata
NIST Behrampur: AKPanda, MDas,
 ADas, SPattnaik; RMahapatro ;
 JPanda, BPattnaik ; BPattnaik

USA

- 1)UCRiverside: AKMulchandani
- 2)MSU East Lansing: JRose
- 3)Stanford University: KSaraswat
- 4) NJIT: DMisra; BRajendran



3a. COD and Microbe Sensors

To develop sensors for

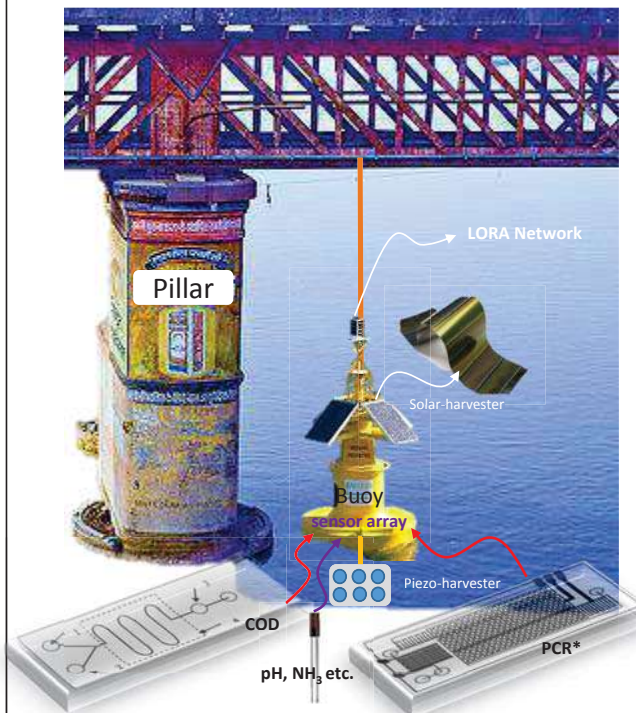
COD sensor (AM/SJ)-

- microfluidic mixing of sample & reagents
- on-chip heating for chemical reduction
- on-chip electrochemical/optical sensing
- suited for organics, dyeing, leather industry effluents etc.

Microbe sensor (SJ/AM)-

- On-chip PCR*
- 3 model organisms to be tested – *Salmonella*, *Vibrio* and Fecal Coliform
- on-chip electrochemical detection of amplicon within 45 min

Alternatively, microbial indicator to be tested using antibody-SWCNT-chemiresistive transducer array against *V. cholera* and *E. coli*



*Korean patent no. 1012313730000; Jha et. al. 2012 Lab Chip

Intelligent water meter system

- water velocity, elevation and water depth
- pH, conductivity, etc.

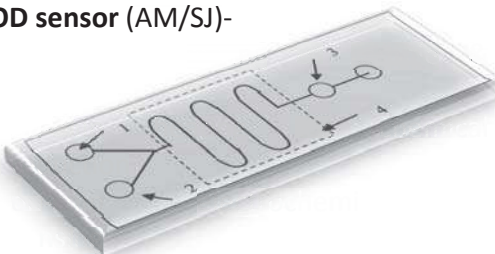
Integrate developed sensors + off-the shelf sensors e.g. pH, conductivity, NH₃ etc. with ASIC chip

- Field validation of data from sensors
- Developed sensors to be inserted in Buoy as cassette (up to 30 each)
- Proposed sensing schedule: **5 am and 12 noon**
- Maintenance (microchannel cleaning) at 3 pm
- Energy requirement: 50 W min.

3a. COD and Microbe Sensors

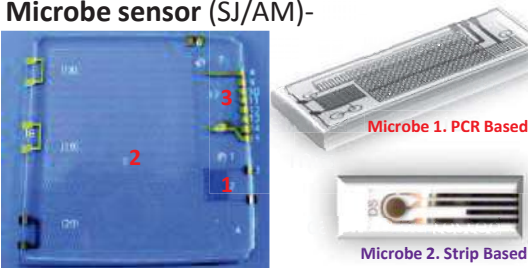
To develop sensors for

COD sensor (AM/SJ)-



1. Sample
2. Reagent
3. Detection Zone
4. Peltier/microheater

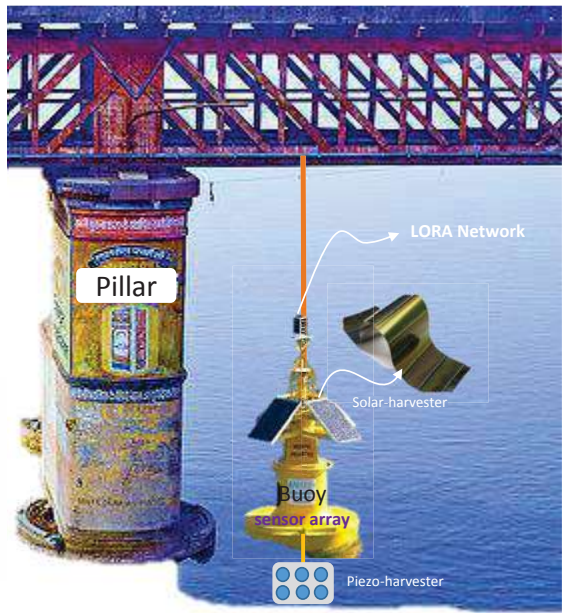
Microbe sensor (SJ/AM)-



Microbe 1. PCR Based

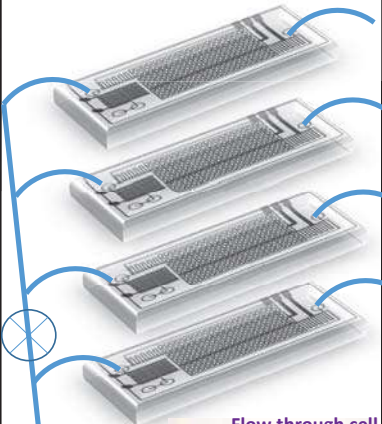
Microbe 2. Strip Based

On-chip PCR*: 1. Cell lysis 2. Thermal Cycling 3. DNA amplicon detection



Integration

Sensor cassette: COD, Microbe



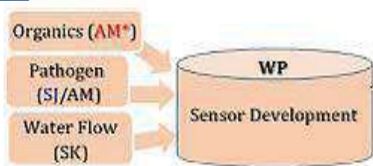
Flow through cell

pH, NH₃, Microbe-2

Sample from river

*Korean patent no. 1012313730000; Jha et. al. 2012 Lab Chip

3a. Water Flow Measurement (A.K.Gosain, S.Kar)

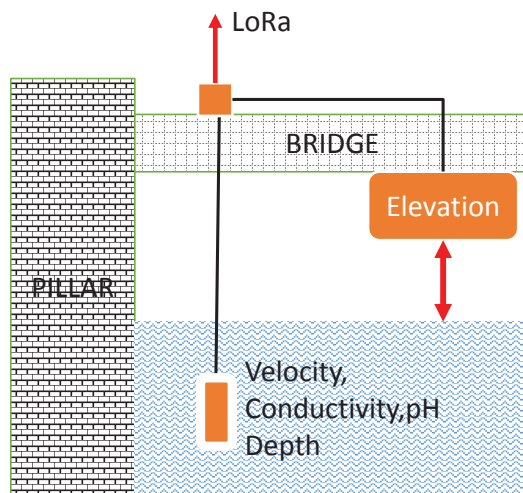


Components in WP4.3

- Water Flow Velocity
- Water Conductivity
- pH measurement
- Water elevation
- Water depth

Methodology for its development

Water flow velocity – hand-held dip equipment based on prop and integrated flume; water conductivity, pH – differential electrode based measurement; water elevation –TDR; water depth



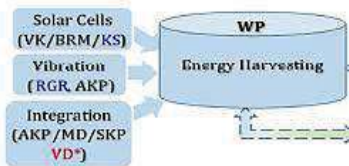
Expected outcome* (all equipment have LoRa connectivity)

- Hand held water velocity meter
- Portable conductivity, pH measurement meter
- Portable water elevation meter (from bridge)
- Water depth measurement from bridge

Energy requirement, other features etc.

- All equipment are portable, battery powered and solar-rechargeable

3b. Energy Harvesting System

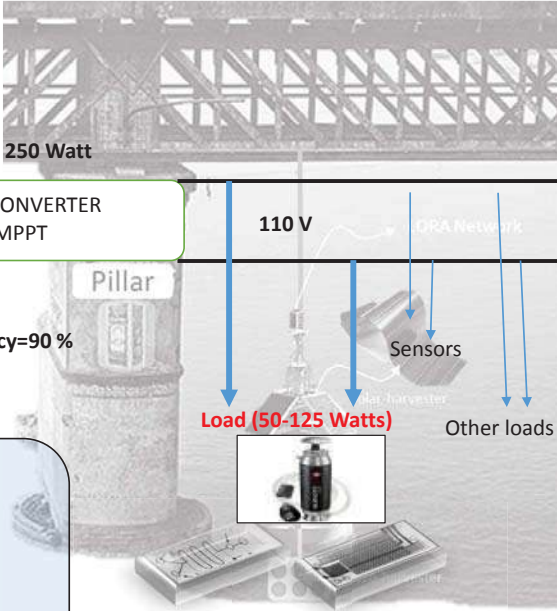


Piezoelectric Module



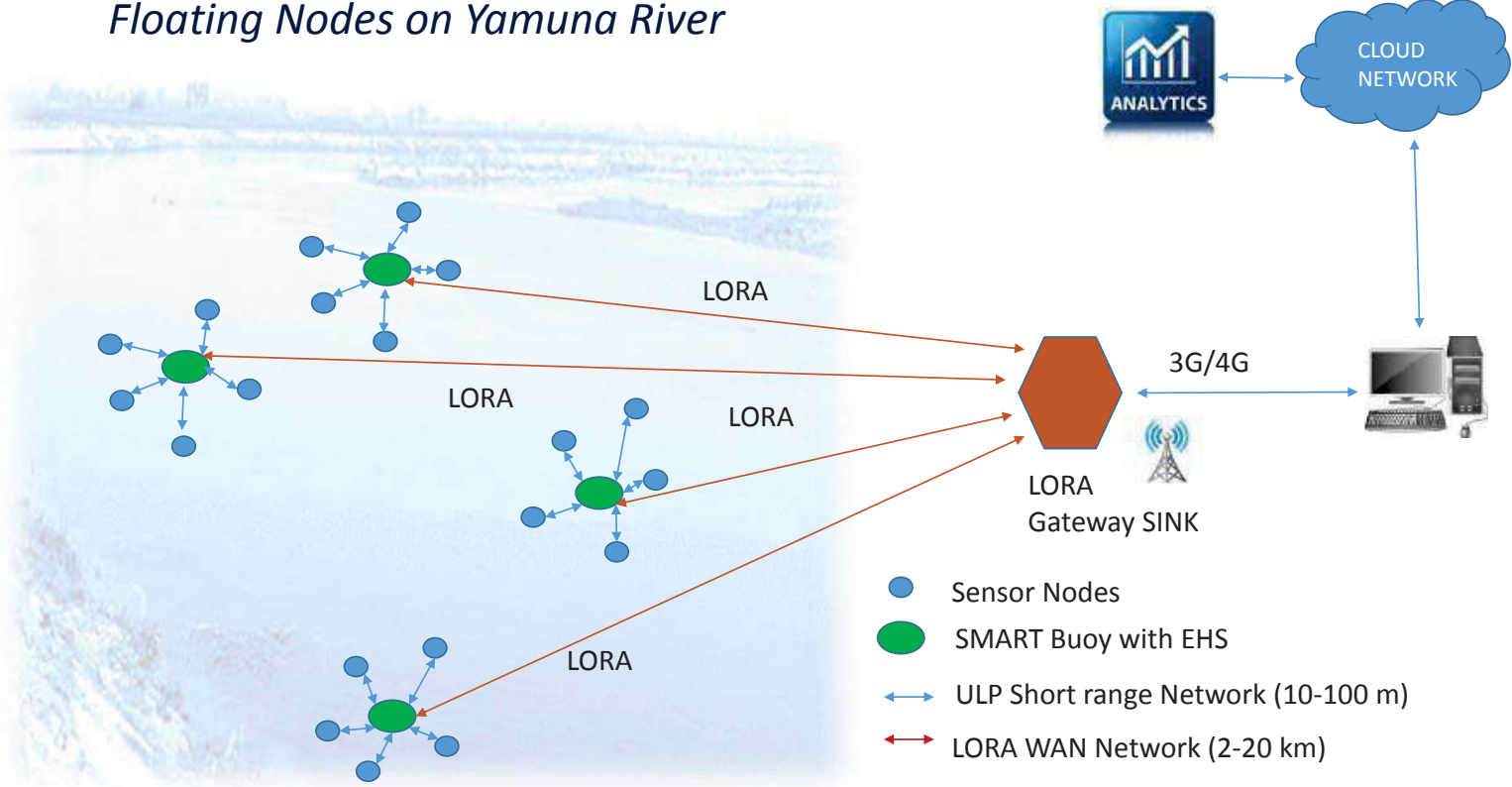
Solar Modules

Specifications:
 Solar Modules -----> 3 in Series Each of 125 W
 (125x3=375 W)
 Each Module -----> Max Power =125 W
 Open circuit Voltage=21 V
 Short Circuit Current= 7.9 A
 Max Voltage= 17 V
 Max Current=7.4 A

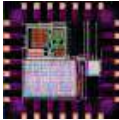


Silicon heterojunction solar cells by Plasma Enhanced CVD

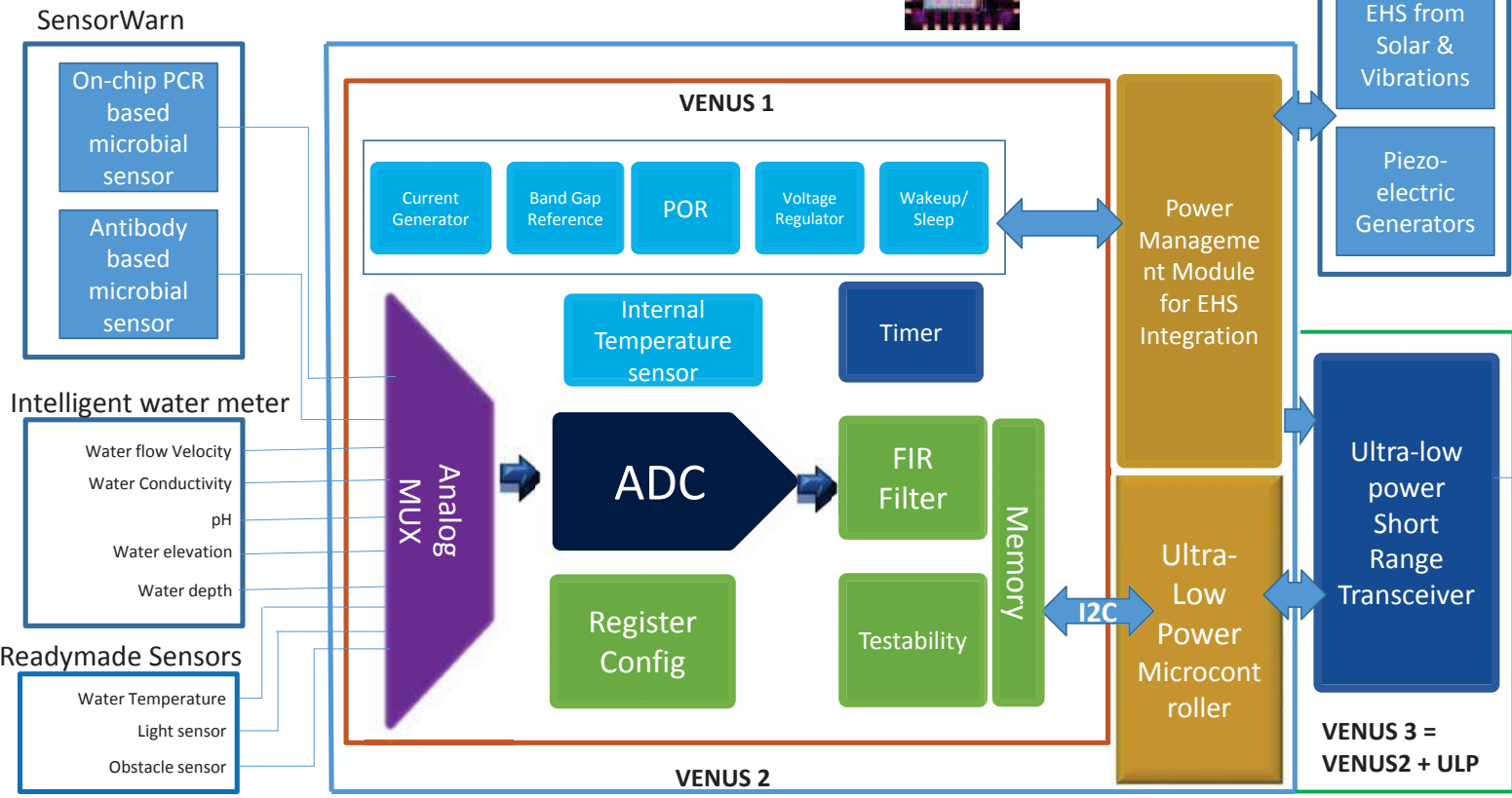
3c. Wireless Sensor Network with LORA Floating Nodes on Yamuna River



Sensor Node Integration ASIC Platform



Mercury testchip - Precursor to Venus-1



3d.Data Analytics – New Algorithms & Platforms

- LSTM (Long Short term Memory) Recurrent Neural Networks: industry standard (but uses second generation neuron models).
- Development of third generation Spiking Neural Networks (SNN) – mimicking the key time-based information processing aspects of the brain
- Key approaches:
 - SOM (Self organizing maps) based data visualization, anomaly detection
 - LSTM framework and platform for data analysis
 - New spike domain algorithms

- *Error Detection*
- *Alarm for warning*
- *Prediction for future data as proactive measure*

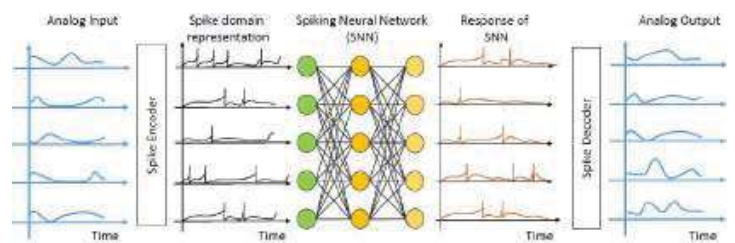


Illustration of a generic framework for SNN based predictive learning and control system.

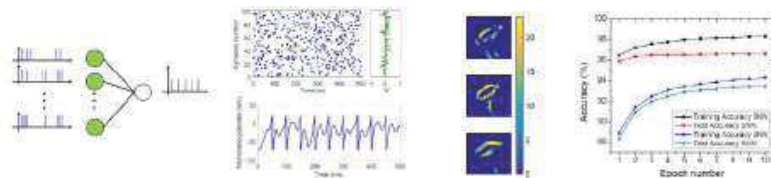
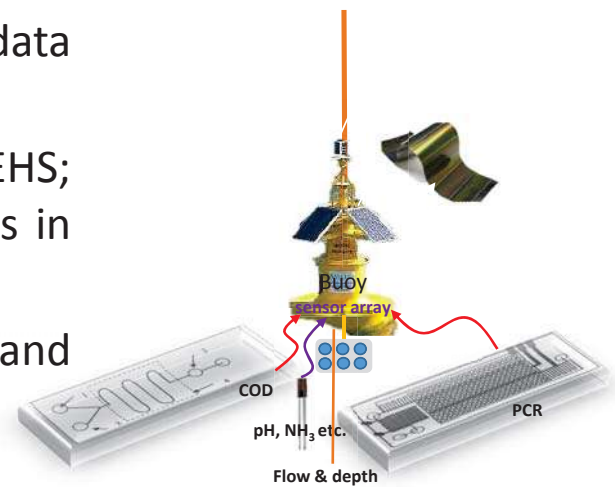


Illustration of Spike based information encoding and spiking neural network

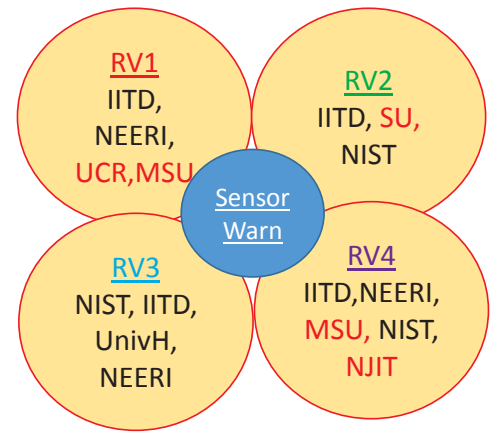
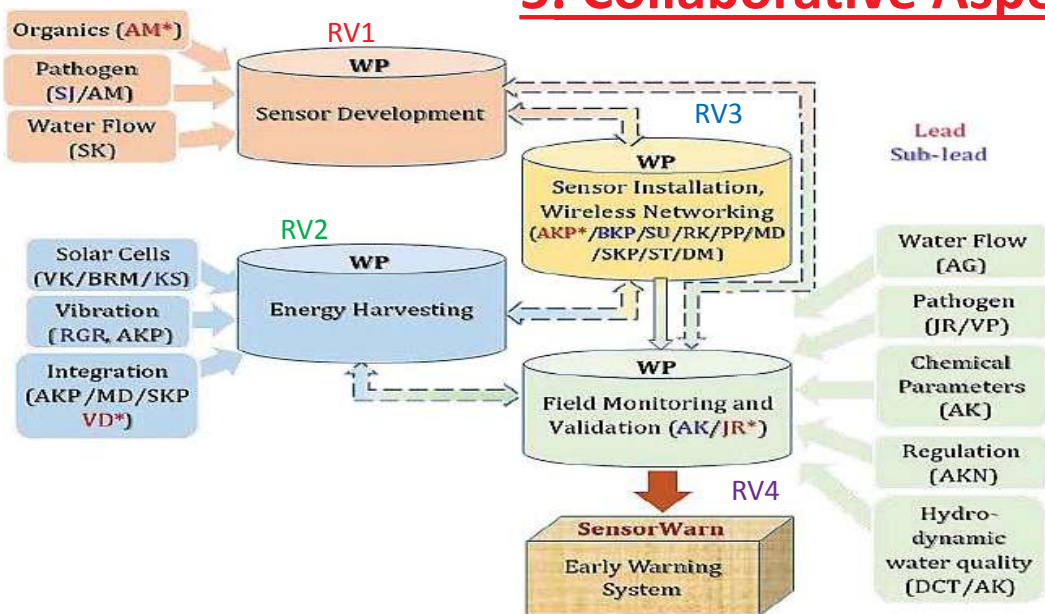
4. Potential/Possible Deployable Outcomes

1. Real-time data on pH, conductivity; daily data on microbial quality, organic matter
2. Information on field employability of EHS; heterojunction silicon solar cell technologies in Indian conditions
3. Database development for learning and prediction
4. A decision-making App for stakeholders



5. Collaborative Aspects

IIT D(12); NISTB(8); UH(1);
 NEERI(3); MSU(1);
 Stanford(1); UCR(1); NJIT(2)



Schematic showing interconnectedness of different tasks of the proposal

(AM: A.Mulchandani, UC Riverside, USA; KS-K. Saraswat, Stanford Univ. USA; JR-J. Rose, MSU, USA; DM: Durgamadhab Misra; BR-B Rajendran, NJIT) (SJ: S.Jha, IITD; SK: S. Kar, IITD; VK: V. Komarala, IITD,India;BRM: Mehta, IITD; VRGR: V.Ramgopal Rao, IITD; VD: V Dutta, IITD; BKP: B K Panigrahi, IITD; SU: S. Udgata, Univ. Hyderabad. ,India; PP: P. Prasad, NEERI India; ST: S.Tandon, NEERI India;RK-R. Kumar, NEERI, India; AK: A. Kumar, IITD; AG-A K Gosain, IITD; VP:V. Perumal, IITD; AKN-AK Nema, IITD; DCT: Dhanya CT, IITD; AKP: Ajit Kumar Panda; MD: Mrinal Das; SKP: Santosh Kumar Patnaik)

Summary of different sub-tasks and contributing expert

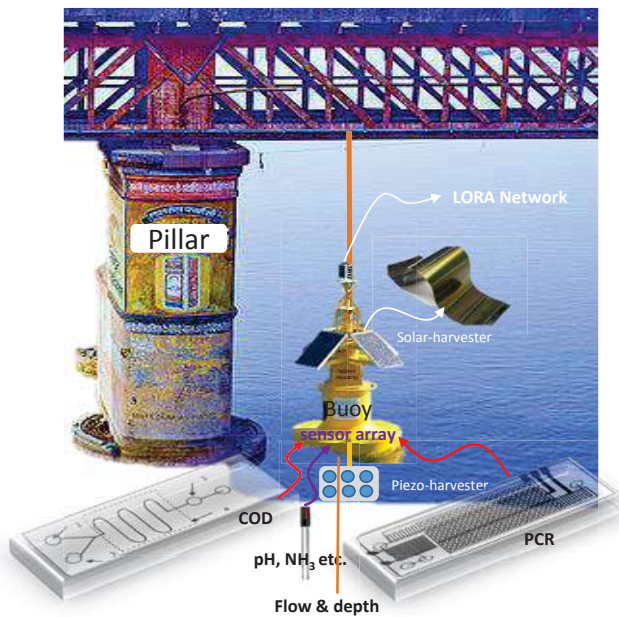
Sub-tasks	Contributing expert
WP1.1: Sensors for COD measurement (Lead: A. Mulchandani)	Sandeep Jha; Poonam Prasad
WP1.2: Sensors for pathogens measurement(Lead: S. Jha)	Ashok Mulchandani; Joan Rose
WP1.3: Sensors for water flow measurement(Lead: S Kar)	A. K. Gosain; Dhanya, C.T.
WP1.4: Integration of sensors including under development and commercial ones on ASIC chip (Ajit Kumar Panda)	Mrinal Das, Santosh Kumar Patnaik, Durgamadhab Misra
WP2: EHS for sensors and related components (Lead: V. Dutta)	A. K. Panda, V. Komarala; B.R. Mehta; VRG Rao; Krishna Saraswat
WP3.1:Sensor installation and networking (Lead: Ajit Kumar Panda)	S. Udgata; B.K. Panigrahi; P. Prasad; S. Tandon; M.Das,S. K. Patnaik; Durgamadhab Misra; B. Rajendran
WP3.2:Optimization of sensor installation(Lead: B.K. Panigrahi)	S. Udgata; Poonam Prasad; B. Rajendran
WP4.1: Pathogens(Lead: Joan Rose)	V. Perumal; Arun Kumar
WP4.2:Physiochemical parameters(Lead: Arun Kumar)	Joan Rose
WP4.3:Water flow measurement(Lead: A.K.Gosain)	Subrat Kar; Dhanya, C.T.
WP4.4:Regulatory framework development(Lead: A. K. Nema)	J.Rose; Dhanya, C.T.; A Kumar
WP4.5: Hydrodynamics, water quality modeling (Dhanya, C.T.)	A.K. Gosain; Arun Kumar

Integrated low cost water sensors for real- time river water monitoring and decision- making (“SensorWarn”)

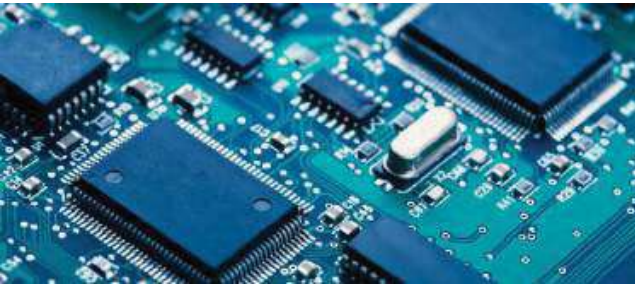
Team: IIT D; NISTB; UH; NEERI;

[MSU](#); [Stanford](#); [UCR](#); [NJIT](#)

Email: (arunku@civil.iitd.ac.in)



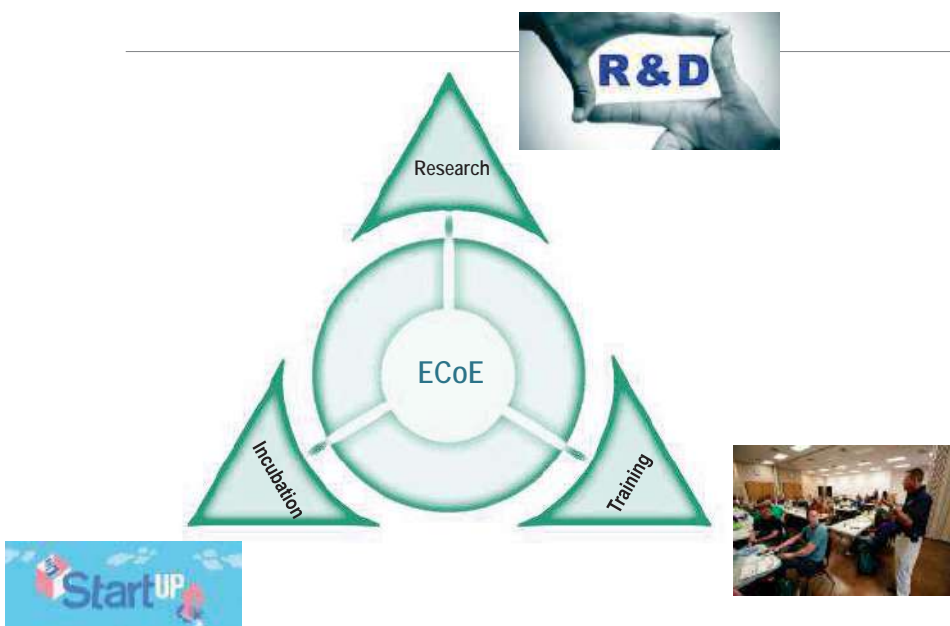
1. Real-time data on pH, conductivity; daily data on microbial quality, organic matter
2. Information on field employability of EHS; heterojunction silicon solar cell technologies in Indian conditions
3. Database development for learning and prediction
4. A decision-making App for stakeholders



Electronic Center of Excellence

ENABLING ECOSYSTEM FOR ELECTRONICS SYSTEM DESIGN AND
MANUFACTURING

Electronic Center of Excellence



Quality Training

- ❑ Domain depths (Design, Verification, Physical Design, PCB, Characterization, Embedded)
- ❑ End-to-end flow (Systems solutions, Spec-to-tape out flow, Post Silicon)
- ❑ Complementary hands on mini-projects

Research with Productization mind

- ❑ Every year one chip fabricated and tested
- ❑ Water quality monitoring – ASIC chip
- ❑ Focus on one strategic area - IoT

Consultancy to Incubation

- ❑ Platform for contractual research for prototype creation
- ❑ Consultancy on Electronic System/chip development
- ❑ Advanced research gets funded with an end goal of incubation

Electronic Center of Excellence *cont.*



Electronics Training

ECOE specializes with a new pedagogy of training which is directly linked with industry's need. Several Industry mentors directly and indirectly partners to make ECOE trainings best-in-class unique solution.



Electronics Research

ECOE envisions advanced research that nurtures ideas and innovation to prototype and final productization. This means taking care of productization issues at early stage of research. Some of ECOE research will lead to independent incubations.



Electronics Incubations

ECOE incubations are a holistic outlook for growing a nascent idea to successful business. It starts from consultancy (customer centric) and builds a vertical focus towards successful start-ups. Involves close mentoring, financial support, customer connects and ecosystem partners.

Industry Oriented Training

Bridging Industry with Academia



Name of Program	Duration	Key Contents	Purpose	Eligibility
Level 1: VLSI Design Engineer	4 weeks (250 hrs)	Basics of Digital and Analog design, Simple CMOS IC Design and layout	Entry level training providing a hands-on exposure of different domains in ESDM.	<ul style="list-style-type: none"> Industry Employee or 2nd / 3rd Year B Tech 1st Year M Tech
Level 2: Analog Design Engineer	6 weeks (300 hrs)	Analog/Mixed Signal Design and Layout, CMOS circuit design basics	Beginners training into Analog design basics with hands-on experience.	<ul style="list-style-type: none"> Industry employee or Completion of Level1 3rd/4th Year B Tech 2nd Year M Tech
Level 2: Digital Design Engineering	6 weeks (300 hrs)	Fundamentals of Digital Circuits and Systems, CMOS Digital Circuits and Analysis	Beginners training into Digital front end and back end design with hands on experience.	<ul style="list-style-type: none"> Industry Employee or Completion of Level1 3rd/4th Year B Tech 2nd Year M Tech
Level 3: Live Projects	6 months-1 year	Chip design project on Analog, Digital Design or hardware characterisation	Live project execution on projects relevant to industry	<ul style="list-style-type: none"> Industry employee or Completion of L1 and L2 (any one) Final year B Tech Final Year M Tech

eCOE Training

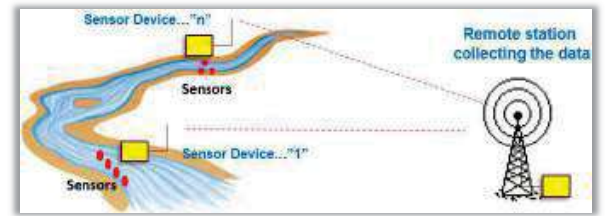
- Business model
 - Industry advanced training (Convert new hires into ready-for-project)
 - Select - train – hire for partner companies (Pre-select and train fresh students to match needs of partner)
- Differentiated methodology
 - Follow Bottom-up and Top Down Philosophy
 - Theory mixed with Hands-on
 - Combined trainers from best of Industry and Academics
 - End-to-end environment of Electronic Ecosystem
 - Active chip design projects for DST funded research activities
 - Ample focus on “Making a mindset change”



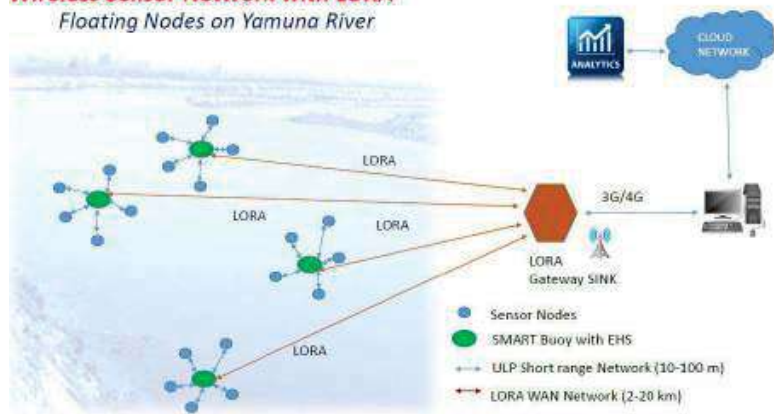
Electronic Research - 1

Real Time Water Quality Monitoring

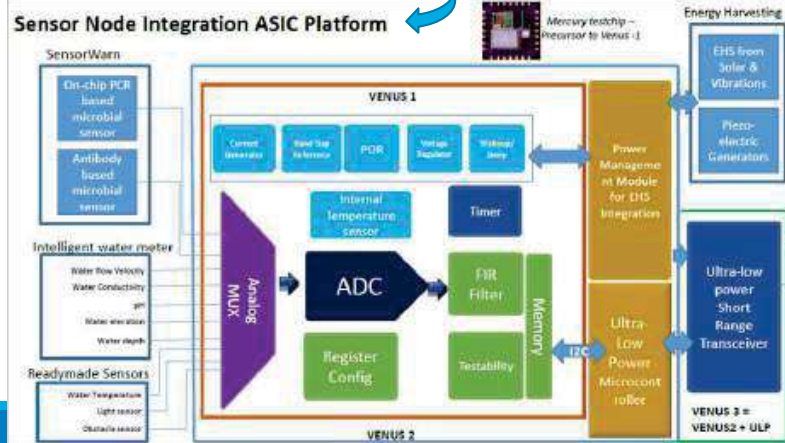
IoT Research with Make-in-India chips



Wireless Sensor Network with LORA
Floating Nodes on Yamuna River

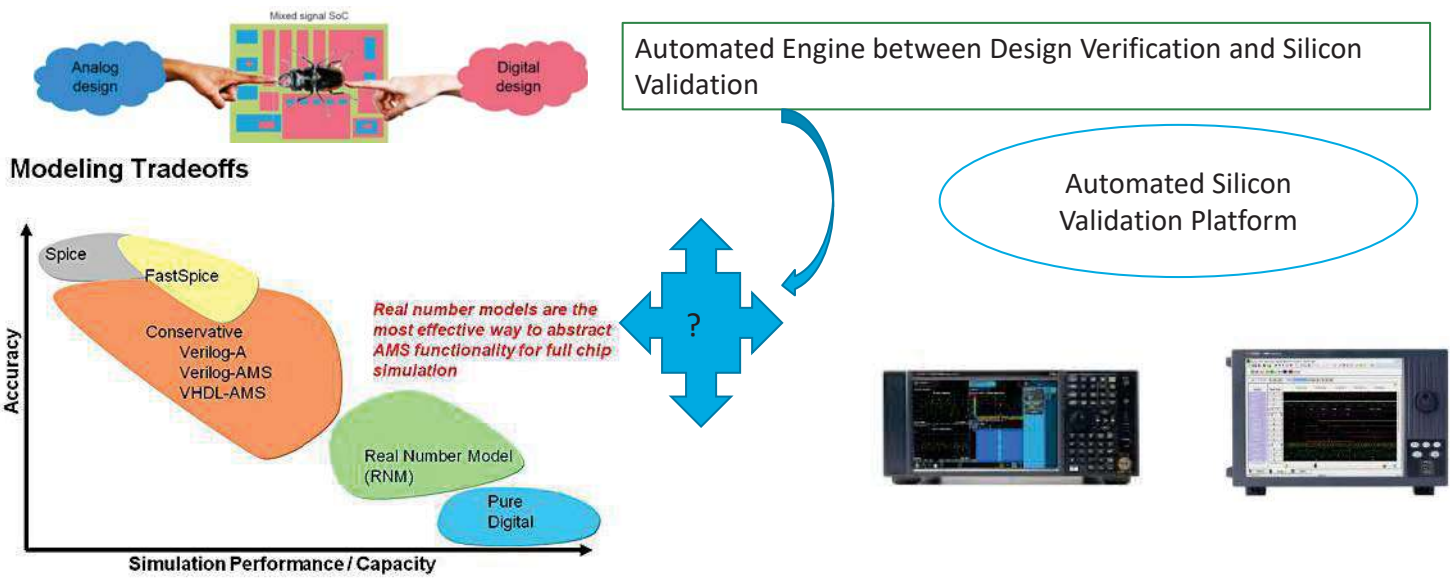


Chip Design under Progress

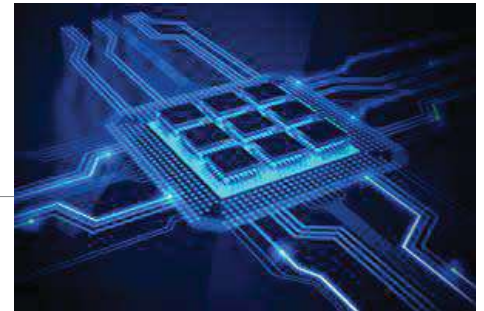


Electronic Research - 2

Verification and Validation Platform with prototype testing chip design



eCOE Consultancy Services



- Broad areas of consulting
 - Electronic Chip Design (turnkey or IP module)
 - Research for new Product/module development
 - Embedded system design
 - PCB Development
 - Silicon Characterization & Debug
- India Chip Program (InChiP)
 - ECOE develops one testchip per year in Industry-Academia Research environment
 - Each chip is done with utmost care to ensure high quality and productization standards.
 - We encourage Industry and Academic partners to work towards a specific goal which is to develop one portion of the larger chip.
 - ECOE owns complete development of the chip from specification to tapeout and in-house silicon characterization.

ECOE Smart LAB for Silicon testing

Fully Operational

• Fully functional Hardware testing facility

- Oscilloscope
- Logic Analyzer
- Signal Analyzer
- Vector Network Analyzer
- Serial BERT
- Microwave Analog Signal generator
- Pulse Function Arbitrary Noise generator
- Arbitrary Waveform Generator
- Electronic Load
- Labview from national Instruments
- PCB Design and Development

* *Details available on request*

** *Comes with human support for data capture and automation*



ECOE Partners



Industry Partners



Academic Partners



Research Partners



Ecosystem Partners



ECOE Summer Industry Internship/Training in VLSI Design during 16th September to 16th October 2021

----- Forwarded message -----

From: **Mrinal Das** <mrinal.ecoe@gmail.com>

Date: Wed, Sep 15, 2021 at 10:51 AM

Subject: Re: Modified (reduced) version of the Internship/Training offer by eCOE: Confirmed Student List from ECE HITK

To: krishanu datta <krishanu.datta@heritageit.edu>

Cc: 210-Ritwick Bakshi <ritwick.bakshi.ece22@heritageit.edu.in>, Subhanjan <subhanjan.saha.ece22@heritageit.edu.in>, Shubhanshu Kumar <shubhanshu.kumar.ece22@heritageit.edu.in>, Anurima Mallick <anurima.mallick.ece22@heritageit.edu.in>, Sayani Chatterjee <sayani.chatterjee.ece22@heritageit.edu.in>, Rajatava KarChoudhury <rajatava.karchoudhury.ece22@heritageit.edu.in>, 220_Arin Saha <arin.saha.ece22@heritageit.edu.in>, Deepshikha Dutta <deepshikha.dutta.ece22@heritageit.edu.in>, Alisha Bag <alisha.bag.ece22@heritageit.edu.in>, Oindrila Biswas <oindrila.biswas.ece22@heritageit.edu.in>, 191_Tanay Gautam <tanay.gautam.ece22@heritageit.edu.in>, Ajit Kumar Panda <akpanda62@hotmail.com>

Dear All,

I have received payment and confirmation mail from following students :

1. Sayani Chatterjee Roll: 1852101 Contact number:9830862296
Email: sayani.chatterjee.ece22@heritageit.edu.in
2. Subhanjan College Roll: 1852211 Contact: 9903006887
Email subhanjan.saha.ece22@heritageit.edu.in
3. Rajatava KarChoudhury Roll No. 1852083 Contact: 8697110523
Email rajatava.karchoudhury.ece22@heritageit.edu.in
4. Arin Saha Roll No: 1852220 contact number: 8346039320/9609035031
Email: arin.saha.ece22@heritageit.edu.in
5. Ritwick Bakshi Email: ritwick.bakshi.ece22@heritageit.edu.in
6. Anurima Mallick Roll: 1852163 Contact: 7550893578
Email: anurima.mallick.ece22@heritageit.edu.in
7. Tanay Gautam Email:tanay.gautam.ece22@heritageit.edu.in
8. Shubhanshu Kumar Email: shubhanshu.kumar.ece22@heritageit.edu.in

In case I have missed anyone, do let me know.

Accordingly, going ahead with the scheduling of classes. For this week sessions will be on Thursday (4-6 PM) , Friday (4-6 PM) , Saturday (4-6 PM) and Sunday (10AM-1PM). Classes will be on Google meet.

Regards,
Mrinal



GSTIN: 33AABCE7582R2ZZ
CIN: U72200DL2007PTC162619

INTERN OFFER LETTER

HR/IOL/2020/04/5001

Date: 30-04-2020

Name of the Candidate: Ankur Kumar

Place of Joining: Bhubaneswar

Internship Start Date: 01-Jul-2020

Confirmation Date: 01-Oct-2020

Dear Ankur Kumar,

With reference to your interview you had with us, we are pleased to offer you the position of “**Intern**” in **VVDN Technologies Pvt. Ltd (hereinafter referred to as “VVDN” or “Company”)** on the following terms and conditions:

1. You will be given a stipend of **Rs. 10 k in hand per month** starting from the day of joining. Upon successful completion of Internship and submission of all necessary document of your Degree Completion, you will be given a CTC of Rs. 3.2 L Per Annum
2. Working days will be **Five days** a week whereas for Production/ Manufacturing, it will be **Six Days** a week. This is subject to any change that may come into force in future. Such changes will supersede all the relevant clauses mentioned in this offer letter.
3. You will be in a training period for the first 6 months from the day of your onboarding with us. During this period, if the Company find the performance of trainee is not at a satisfactory level, services will be terminated with an immediate effect. The training certificate will be given for such trainees who will not be able to continue due to performance issues.
4. Any financial commitments made before joining, will be furnished after three months of regular service wherein employee must not be on the notice period. In case of resignation, before the first three month’s completion, company reserve rights to decline such commitments.
5. You will be required to execute Confidentiality Agreement, Terms and Conditions of Employment and such other documents/ undertakings/ agreements as may be required by **VVDN** from time to time.
6. Any discovery, invention, improvement, adaptation or variation of designs, drawings, processes, methods, material specifications, etc., which will be a result of your working in **VVDN** or its associates, or which you may come to know in the course of your employment, more specifically in relation to the engineering or technology used or adopted by **VVDN**, shall be the property of **VVDN**. You shall treat the above information or data in connection with any work done in **VVDN** strictly confidential. You shall not use, give or sell any or all of the information to any other person or firm for exploitation, for gain or otherwise.
7. All information, papers, correspondence, etc., pertaining to **VVDN** business activities, commercial, technical or otherwise coming into your possession in the course of your employment shall be treated strictly confidential.
8. **Relocation / Transfer:** Transfer to a different function or department or location within **VVDN** can be requested or applied for by an employee only if such an opportunity is available and employee has completed minimum 2 years of service with **VVDN**. The decision on such a matter is at the sole discretion of the Company.

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Corporate Office: B-22, Sector - 34, Infocity, Gurgaon, Haryana - 122001, India

Registered Office: 12/10 East Patel Nagar, New Delhi - 110008, India

www.vvdntech.com | Email: info@vvdntech.com

9. During your tenure with **VVDN**, you may be transferred to any of the Offices/ Departments/ Units of **VVDN** or of associate concerns whether existing or to be set up, anywhere in India or abroad, on the same terms and conditions of employment at the sole discretion of the management. Provided that if you are deputed to any associate/subsidiary/group concern outside India by **VVDN**, you shall be treated as having bound yourself to serve **VVDN** for the deputation period, and for the stipulated period, thereafter, if any, and the same shall be treated as the contract period vis-a-vis this contract of service.
10. **Leave:** Regular full time employees will have planned and unplanned leaves as per the VVDN Leave Policy whereas if you join as an Intern/ Trainee, you will be entitled to get one unplanned leave in a month on pro rata basis. Please refer leave policy for more details.
11. During your tenure with **VVDN**, you will be governed by the Service Rules and regulations of **VVDN** currently in force or as introduced/awarded from time to time.
12. Either party can terminate this employment by serving a notice on the other party. The employee is required to serve a compulsory notice of 90 days whereas Company shall serve a notice of 30 days. Such separations will ask for the adjustment to the applicable cost incurred for the enablement of the individual by any means of development in any way.
13. During notice period, if the employee's attitude is found unacceptable, Company reserves the right to terminate the employment immediately without any notice period and Company shall not be liable to compensate the employee for notice period in any manner.
14. Company has rights to hold employee's salary during notice period, based on the performance feedback from the concerned reporting manager.
15. There will be a performance assessment in every financial year. Employee must have completed at least 6 months of continuous services in **VVDN** to become eligible for performance assessment. Based on assessment, the compensation will be revised.
16. You have been enrolled on the presumption that the particulars furnished by you are correct. In the event the said particulars are found to be incorrect or that you have concluded or withheld some other relevant facts, your appointment with **VVDN** shall stand terminated/ cancelled without any notice.
17. You will diligently carry out, to the best of your ability all such duties and responsibilities as may be entrusted to you from time to time and you shall not engage yourself either directly or indirectly in any other employment, business or occupation other than your curriculum.
18. Your email acceptance of this offer is expected within 15 days from the date of releasing the offer letter. This offer shall become void after completion of 15 days in-case no acceptance is received from the candidate.
19. As per the business requirements, company can ask for short or long term travel/ deployment to any of the work location in India or abroad.
20. In any such case, where trainee wants to leave the training or absconds or performs not as per the expectations due to which his confirmation of the services doesn't happen, trainees are liable to pay

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the training expenses as recovery which is not only limited to the six months stipend amount but also up to a sum of Rs. 2,00,000/- towards training cost, irrespective of the internship duration.

Please Sign the duplicate copy of this letter and return the same as token of your acceptance [Acceptance is through email or signatures] of the terms and conditions detailed in the letter.

On the day of your joining, **please bring original and photocopies** of the following for verification:

- **Pan Card**
- **Aadhar Card**
- **2 Color photographs, passport size**
- **10th Certificate**
- **12th Certificate**
- **All semester mark-sheets & Degree certificate**
- **Form 16 (If applicable)**
- **UAN Card (If applicable)**
- **Pay slips of last 3 months from the previous employer**
- **Latest offer letter from the previous employer**
- **Experience letter from all previous employers**
- **Passport** (Passport is mandatory at the time of joining. In case you do not possess a valid passport, we want you to apply for it in advance and submit the copy of application to HR department within one month of your joining)

Wishing you a rewarding career with **VVDN** and welcoming you to our Pursuit of Excellence.

Yours sincerely,

For VVDN Technologies Pvt. Ltd.

Name of the Candidate: Ankur Kumar

Authorized Signatory

Signature: -----

INTERN OFFER LETTER

HR/IOL/2020/04/5000

Date: 30-04-2020

Name of the Candidate: Arijit Das
Place of Joining: Bhubaneswar
Internship Start Date: 01-Jul-2020
Confirmation Date: 01-Oct-2020

Dear Arijit Das,

With reference to your interview you had with us, we are pleased to offer you the position of “**Intern**” in **VVDN Technologies Pvt. Ltd (hereinafter referred to as “VVDN” or “Company”)** on the following terms and conditions:

1. You will be given a stipend of **Rs. 10 k in hand per month** starting from the day of joining. Upon successful completion of Internship and submission of all necessary document of your Degree Completion, you will be given a CTC of Rs. 3.2 L Per Annum
2. Working days will be **Five days** a week whereas for Production/ Manufacturing, it will be **Six Days** a week. This is subject to any change that may come into force in future. Such changes will supersede all the relevant clauses mentioned in this offer letter.
3. You will be in a training period for the first 6 months from the day of your onboarding with us. During this period, if the Company find the performance of trainee is not at a satisfactory level, services will be terminated with an immediate effect. The training certificate will be given for such trainees who will not be able to continue due to performance issues.
4. Any financial commitments made before joining, will be furnished after three months of regular service wherein employee must not be on the notice period. In case of resignation, before the first three month’s completion, company reserve rights to decline such commitments.
5. You will be required to execute Confidentiality Agreement, Terms and Conditions of Employment and such other documents/ undertakings/ agreements as may be required by **VVDN** from time to time.
6. Any discovery, invention, improvement, adaptation or variation of designs, drawings, processes, methods, material specifications, etc., which will be a result of your working in **VVDN** or its associates, or which you may come to know in the course of your employment, more specifically in relation to the engineering or technology used or adopted by **VVDN**, shall be the property of **VVDN**. You shall treat the above information or data in connection with any work done in **VVDN** strictly confidential. You shall not use, give or sell any or all of the information to any other person or firm for exploitation, for gain or otherwise.
7. All information, papers, correspondence, etc., pertaining to **VVDN** business activities, commercial, technical or otherwise coming into your possession in the course of your employment shall be treated strictly confidential.
8. **Relocation / Transfer:** Transfer to a different function or department or location within **VVDN** can be requested or applied for by an employee only if such an opportunity is available and employee has completed minimum 2 years of service with **VVDN**. The decision on such a matter is at the sole discretion of the Company.

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9. During your tenure with **VVDN**, you may be transferred to any of the Offices/ Departments/ Units of **VVDN** or of associate concerns whether existing or to be set up, anywhere in India or abroad, on the same terms and conditions of employment at the sole discretion of the management. Provided that if you are deputed to any associate/subsidiary/group concern outside India by **VVDN**, you shall be treated as having bound yourself to serve **VVDN** for the deputation period, and for the stipulated period, thereafter, if any, and the same shall be treated as the contract period vis-a-vis this contract of service.
 10. **Leave:** Regular full time employees will have planned and unplanned leaves as per the VVDN Leave Policy whereas if you join as an Intern/ Trainee, you will be entitled to get one unplanned leave in a month on pro rata basis. Please refer leave policy for more details.
 11. During your tenure with **VVDN**, you will be governed by the Service Rules and regulations of **VVDN** currently in force or as introduced/awarded from time to time.
 12. Either party can terminate this employment by serving a notice on the other party. The employee is required to serve a compulsory notice of 90 days whereas Company shall serve a notice of 30 days. Such separations will ask for the adjustment to the applicable cost incurred for the enablement of the individual by any means of development in any way.
 13. During notice period, if the employee's attitude is found unacceptable, Company reserves the right to terminate the employment immediately without any notice period and Company shall not be liable to compensate the employee for notice period in any manner.
 14. Company has rights to hold employee's salary during notice period, based on the performance feedback from the concerned reporting manager.
 15. There will be a performance assessment in every financial year. Employee must have completed at least 6 months of continuous services in **VVDN** to become eligible for performance assessment. Based on assessment, the compensation will be revised.
 16. You have been enrolled on the presumption that the particulars furnished by you are correct. In the event the said particulars are found to be incorrect or that you have concluded or withheld some other relevant facts, your appointment with **VVDN** shall stand terminated/ cancelled without any notice.
 17. You will diligently carry out, to the best of your ability all such duties and responsibilities as may be entrusted to you from time to time and you shall not engage yourself either directly or indirectly in any other employment, business or occupation other than your curriculum.
 18. Your email acceptance of this offer is expected within 15 days from the date of releasing the offer letter. This offer shall become void after completion of 15 days in-case no acceptance is received from the candidate.
 19. As per the business requirements, company can ask for short or long term travel/ deployment to any of the work location in India or abroad.
 20. In any such case, where trainee wants to leave the training or absconds or performs not as per the expectations due to which his confirmation of the services doesn't happen, trainees are liable to pay

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the training expenses as recovery which is not only limited to the six months stipend amount but also up to a sum of Rs. 2,00,000/- towards training cost, irrespective of the internship duration.

Please Sign the duplicate copy of this letter and return the same as token of your acceptance [Acceptance is through email or signatures] of the terms and conditions detailed in the letter.

On the day of your joining, **please bring original and photocopies** of the following for verification:

- **Pan Card**
- **Aadhar Card**
- **2 Color photographs, passport size**
- **10th Certificate**
- **12th Certificate**
- **All semester mark-sheets & Degree certificate**
- **Form 16 (If applicable)**
- **UAN Card (If applicable)**
- **Pay slips of last 3 months from the previous employer**
- **Latest offer letter from the previous employer**
- **Experience letter from all previous employers**
- **Passport** (Passport is mandatory at the time of joining. In case you do not possess a valid passport, we want you to apply for it in advance and submit the copy of application to HR department within one month of your joining)

Wishing you a rewarding career with **VVDN** and welcoming you to our Pursuit of Excellence.

Yours sincerely,

For VVDN Technologies Pvt. Ltd.

Name of the Candidate: Arijit Das

Authorized Signatory

Signature: -----

To **Dr. Ajit Kumar Panda**
VVDN Technologies Pvt Ltd
Corporate Office
B-22 Sector 34
Infocity
Gurgaon
Haryana – 122001

12th May 2020

Sub: “Work from Home” INTERNSHIP 2020

Dear Sirs

We are indeed happy to allow the following students from Heritage Institute of Technology, Electronics and Communication Engineering Department, to start as interns with your esteemed organization, for a period of 3 months, starting immediately, although they have not as yet completed their graduation. We are happy to note that on completion of this internship they will be absorbed in your organization.

We are also glad to note that you have agreed to provide leave to both of them during their final examination and for any laboratory work to complete the necessary formalities for completing their degree, as and when this is scheduled.

1 Name : ARIJIT DAS

DEPT : Electronics and communication Engineering

University Roll No. 12616003031, College Roll No. 1652073

Mobile No. 8620966085; Email : arijit.das.ece20@heritageit.edu.in

2 Name : ANKUR KUMAR

DEPT : Electronics and communication Engineering

University Roll No. : 12616003023, College Roll No.1652066

Mobile No. 8481928414; Email: ankur.kumar.ece20@heritageit.edu.in

We are confident that the students will carry out their internship diligently and would be a great asset to VVDN Technologies Pvt. Ltd.

With regards

Yours faithfully

Signed/-

Elizabeth Shaw

Coordinator, Training & Placement

The Heritage Group of Institutes

994 Madurdaha, Chowbaga Road, Anandapur

Kolkata 700 107

Mobile No.: 9830411809

Email :hitplacement@heritageit.edu

2nd December, 2020

**Shuvam Podder
8/18, Netaji Nagar,
Kolkata-700092**

Re.: Internship with HCL Technologies Limited

Dear **Shuvam Podder,**

Congratulations!

This is in response to your application for internship dated **7th December, 2020**.

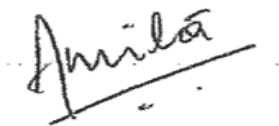
We are pleased to offer you an internship in **HCL Technologies Limited** ("HCL" or "Company").

You are required to report to **Priyanko Mitra** at the following Address **HCL Technologies Ltd, Kolkata-SEZ, Rajarhat, DH Street** on **7th December, 2020** at **9:00 AM**.

The internship shall be governed by the terms and conditions as laid down hereunder in this internship agreement as stated in **ANNEXURE 1**.

We extend a warm welcome to you as an 'intern' in our establishment.

For HCL Technologies Limited,



**Amrita Das
Vice President, Head-Global Rewards**

Shuvam Podder

Internship Agreement - ANNEXURE 1

1. The duration of your internship would be **6 months**. Your internship shall come to an automatic end on **7th June, 2021**. Please note that this internship is not an offer for employment by the Company and doesn't create any employer and employee relation and neither of us intends any employment relationship to be created either now or at any time in the future, accordingly regulations governing employment with the Company will not apply to you.
2. As an intern, your position shall always be that of a 'learner', who is conducting an organizational study, while the Company shall hold the position of a 'teacher' or 'instructor'.
3. During your internship with the Company, you will be paid a stipend of **INR 12,000** per month, subject to deductions as per applicable tax laws.
4. You will be off on all weekends, public holidays as per the published Holiday calendar for **HCL Technologies Limited**, accessible through **www.myhcl.com**. You may take personal leaves in exigencies and you should keep your mentor and HR Partner informed.
5. During the internship, you would be required to conduct the study during the normal working hours from **9:00 am to 6:30 pm** on Mondays to Fridays. You may also be required to attend trainings in shifts as permitted by law. The shifts and timings are subject to change and will be communicated to you from time to time.
6. The company expects you to undertake, attend and complete your internship with high standards of integrity and to maintain appropriate standards of behavior at all times.
7. Your continuation in internship shall be subject to the satisfactory verification of your credentials, testimonials, etc. and the details given by you in your Application Form/ Declaration. Your internship shall be liable to be terminated summarily if it is found at any time that you have concealed any material information or given any false information/ particulars or convicted of or pleaded guilty of any offence or crime.

Shuvam Podder

For the avoidance of doubt, your signature in this Letter constitutes your express authorization to the Company (or the appointed third party) to conduct a background investigation on your credentials, as may be necessary.

8. You will be required to maintain utmost secrecy and shall not divulge or disclose to anyone in any manner, particulars or details of any information or data that you may come to possess by virtue of your association with the Company, including details of the trade secrets, manufacturing or research process, financial, administrative and /or organization matter or any transaction or affairs of the Company of confidential nature.
9. You are expected to acquaint yourself with the governance related Company policies which are available at the Company's online portal or may be acquired from the HR representatives at the respective premises. If at any time in the opinion of the Company, you are found to be guilty of fraud, dishonesty, disobedience, disorderly behaviour, negligence, indiscipline, or any other conduct considered by to be deterrent to the Company's interest or of violation of one or more terms of this internship letter, the Company reserves the right to terminate your internship without notice. The decision of the Company in this regard shall be final.
10. All inventions, discoveries, improvements, copyrightable material, trademarks ideas and concepts and other intellectual property rights that you may make or conceive, either solely or jointly with others, during the period of your internship, shall be deemed to be the exclusive property of the Company and you hereby waive any and all rights, title or interest, if any, in the same in favour of the Company. Further, it is expected that you to promptly reduce to writing and disclose to the Company all such inventions, discoveries, improvements, copyrightable material, trademarks ideas and concepts and other intellectual property rights, which you may make or conceive during the internship.
11. You will be responsible for safekeeping and return in good condition and order of all Company assets, which may be in your use, custody or charge; failing which the Company shall be entitled to recover the costs of the same from you.

Shuvam Podder

12. You expressly agree and undertake to fully indemnify, compensate and hold the Company harmless from and against any and all claims, demands, damages, injuries, expenses and liability arising directly or indirectly from your acts or omissions. You further agree that you will defend at your own expense and will indemnify and hold the Company harmless from and against any and all damages, demands, expenses, claims, liability, injuries, suits and proceedings asserted or brought against the Company on a claim that any material, software or other writings or articles developed by you for the Company during the course of your internship with the Company constitutes and infringement of any patent, copyright or other third party intellectual property right.
13. Your continuance on this internship with the Company is subject to your remaining physically and mentally fit. You are expected to undergo medical examination as per the directions of the Company, if required unless prohibited under law.
14. The Company is an equal opportunities Company and has a detailed equal opportunities policy, a copy of which is available at our internal portal. You are required to read the policy and take all necessary steps to ensure that it is properly observed. Failure to comply with the terms of the policy may result in disciplinary action and, in serious cases, termination of internship.
15. Data Protection : You shall at all times be under a duty to provide and update the Company with your personal particulars, including but not limited to residential address, residential telephone number, mobile phone number, identity card number, driving licence number, income tax reference number, name(s), date(s) of birth and contact details of spouse, next of kin, and children.
16. You consent to the Company monitoring and recording any use that you make of the Company's electronic communications systems for the purpose of ensuring that the Company's rules are being complied with and for legitimate business purposes. You shall comply with any electronic communication systems policies, if any, that the Company may issue from time to time.

Shuvam Podder

17. Right to search

- a) The Company reserves the right to search you or any of your property held on the Company's premises, at any time, if the Company believes that you are under the influence of alcohol or restricted drugs or carry a weapon, which could be hazardous to other occupants of the premises or if it believes that you may have committed a criminal offence.
- b) The Company may take assistance of the local government agencies or any other authorized agency for conducting the necessary search as stated above.
- c) If you refuse to comply with the Company's search procedure, such refusal will be treated as misconduct and will entitle the Company to take disciplinary action.
- d) If you use your personal laptop or phone for office purposes, the Company has the right to inspect, take a back-up of the data, and/or submit the laptop and/or phone for forensic analysis on ground of any suspicion or misconduct.

18. Further, during the period of your internship with HCL, you will be required to inter alia comply with the Company's Code of Business Ethics & Conduct, Anti-Bribery & Anti-Corruption, Business Gift and Entertainment policy and Health and Safety policies and failure to do so shall entitle the Company to take appropriate disciplinary action which may lead & include up to termination of your internship with HCL at any time without notice. Copy of such policies is accessible through www.myhcl.com or you can also contact your HR Partner.

19. You would be required to submit the below stated documents on the date of your reporting for your internship.

- a) Qualification certificates
- b) Date of birth certificate
- c) Photographs – 7 no's
- d) Copy of ID Card / Passport.
- e) Proof of your education with <name of university>
- f) Letter from University recommending you for internship.

Shuvam Podder

HCL TECHNOLOGIES LTD.

Corporate Identity Number: L74140DL1991PLD046369:

Technology Hub, Special Economic Zone

Plot No : 3A, Sector 126, NOIDA 201 304, UP, India.

T +91 120 6125000 F +91 120 4683030

Registered Office: 806 Siddharth, 96, Nehru Place, New Delhi-110019, India.

www.hcltech.com

www.hcl.com

If all the above terms and conditions of internship are acceptable to you, please confirm your acceptance by signing and returning to us the duplicate of this Internship letter.

No commitments other than what is mentioned in this Internship Agreement will be applicable to you or entertained by us.

I accept the above terms & conditions

Student's Name: SHUVAM PODDER

Signature : *Shuvam Podder*

Date : 04/12/2020

HCL TECHNOLOGIES LTD.

Corporate Identity Number: L74140DL1991PLD046369:

Technology Hub, Special Economic Zone

Plot No : 3A, Sector 126, NOIDA 201 304, UP, India:

T +91 120 6125000 F +91 120 4683030

Registered Office: 806 Siddharth, 96, Nehru Place, New Delhi-110019, India:

www.hcltech.com

www.hcl.com

2nd December, 2020

Sagar Kumar Lo
Rupnagar, Sonarpur, Kolkata-700150

Re.: **Internship with HCL Technologies Limited**

Dear **Sagar Kumar Lo**,

Congratulations!

This is in response to your application for internship dated **7th December, 2020**.

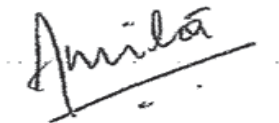
We are pleased to offer you an internship in **HCL Technologies Limited** ("HCL" or "Company").

You are required to report to **Priyanko Mitra** at the following Address **HCL Technologies Ltd, Kolkata-SEZ, Rajarhat, DH Street** on **7th December, 2020** at **9:00 AM**.

The internship shall be governed by the terms and conditions as laid down hereunder in this internship agreement as stated in **ANNEXURE 1**.

We extend a warm welcome to you as an 'intern' in our establishment.

For **HCL Technologies Limited**,



Amrita Das
Vice President, Head-Global Rewards



Internship Agreement - ANNEXURE 1

1. The duration of your internship would be **6 months**. Your internship shall come to an automatic end on **7th June, 2021**. Please note that this internship is not an offer for employment by the Company and doesn't create any employer and employee relation and neither of us intends any employment relationship to be created either now or at any time in the future, accordingly regulations governing employment with the Company will not apply to you.
2. As an intern, your position shall always be that of a 'learner', who is conducting an organizational study, while the Company shall hold the position of a 'teacher' or 'instructor'.
3. During your internship with the Company, you will be paid a stipend of **INR 12,000** per month, subject to deductions as per applicable tax laws.
4. You will be off on all weekends, public holidays as per the published Holiday calendar for **HCL Technologies Limited**, accessible through **www.myhcl.com**. You may take personal leaves in exigencies and you should keep your mentor and HR Partner informed.
5. During the internship, you would be required to conduct the study during the normal working hours from **9:00 am to 6:30 pm** on Mondays to Fridays. You may also be required to attend trainings in shifts as permitted by law. The shifts and timings are subject to change and will be communicated to you from time to time.
6. The company expects you to undertake, attend and complete your internship with high standards of integrity and to maintain appropriate standards of behavior at all times.
7. Your continuation in internship shall be subject to the satisfactory verification of your credentials, testimonials, etc. and the details given by you in your Application Form/ Declaration. Your internship shall be liable to be terminated summarily if it is found at any time that you have concealed any material information or given any false information/ particulars or convicted of or pleaded guilty of any offence or crime.

Sagar Kumar Lo

For the avoidance of doubt, your signature in this Letter constitutes your express authorization to the Company (or the appointed third party) to conduct a background investigation on your credentials, as may be necessary.

8. You will be required to maintain utmost secrecy and shall not divulge or disclose to anyone in any manner, particulars or details of any information or data that you may come to possess by virtue of your association with the Company, including details of the trade secrets, manufacturing or research process, financial, administrative and /or organization matter or any transaction or affairs of the Company of confidential nature.
9. You are expected to acquaint yourself with the governance related Company policies which are available at the Company's online portal or may be acquired from the HR representatives at the respective premises. If at any time in the opinion of the Company, you are found to be guilty of fraud, dishonesty, disobedience, disorderly behaviour, negligence, indiscipline, or any other conduct considered by to be deterrent to the Company's interest or of violation of one or more terms of this internship letter, the Company reserves the right to terminate your internship without notice. The decision of the Company in this regard shall be final.
10. All inventions, discoveries, improvements, copyrightable material, trademarks ideas and concepts and other intellectual property rights that you may make or conceive, either solely or jointly with others, during the period of your internship, shall be deemed to be the exclusive property of the Company and you hereby waive any and all rights, title or interest, if any, in the same in favour of the Company. Further, it is expected that you to promptly reduce to writing and disclose to the Company all such inventions, discoveries, improvements, copyrightable material, trademarks ideas and concepts and other intellectual property rights, which you may make or conceive during the internship.
11. You will be responsible for safekeeping and return in good condition and order of all Company assets, which may be in your use, custody or charge; failing which the Company shall be entitled to recover the costs of the same from you.

Sagar Kumar Lo

12. You expressly agree and undertake to fully indemnify, compensate and hold the Company harmless from and against any and all claims, demands, damages, injuries, expenses and liability arising directly or indirectly from your acts or omissions. You further agree that you will defend at your own expense and will indemnify and hold the Company harmless from and against any and all damages, demands, expenses, claims, liability, injuries, suits and proceedings asserted or brought against the Company on a claim that any material, software or other writings or articles developed by you for the Company during the course of your internship with the Company constitutes and infringement of any patent, copyright or other third party intellectual property right.
13. Your continuance on this internship with the Company is subject to your remaining physically and mentally fit. You are expected to undergo medical examination as per the directions of the Company, if required unless prohibited under law.
14. The Company is an equal opportunities Company and has a detailed equal opportunities policy, a copy of which is available at our internal portal. You are required to read the policy and take all necessary steps to ensure that it is properly observed. Failure to comply with the terms of the policy may result in disciplinary action and, in serious cases, termination of internship.
15. Data Protection : You shall at all times be under a duty to provide and update the Company with your personal particulars, including but not limited to residential address, residential telephone number, mobile phone number, identity card number, driving licence number, income tax reference number, name(s), date(s) of birth and contact details of spouse, next of kin, and children.
16. You consent to the Company monitoring and recording any use that you make of the Company's electronic communications systems for the purpose of ensuring that the Company's rules are being complied with and for legitimate business purposes. You shall comply with any electronic communication systems policies, if any, that the Company may issue from time to time.

Sagar Kumar Lo

17. Right to search

- a) The Company reserves the right to search you or any of your property held on the Company's premises, at any time, if the Company believes that you are under the influence of alcohol or restricted drugs or carry a weapon, which could be hazardous to other occupants of the premises or if it believes that you may have committed a criminal offence.
- b) The Company may take assistance of the local government agencies or any other authorized agency for conducting the necessary search as stated above.
- c) If you refuse to comply with the Company's search procedure, such refusal will be treated as misconduct and will entitle the Company to take disciplinary action.
- d) If you use your personal laptop or phone for office purposes, the Company has the right to inspect, take a back-up of the data, and/or submit the laptop and/or phone for forensic analysis on ground of any suspicion or misconduct.

18. Further, during the period of your internship with HCL, you will be required to inter alia comply with the Company's Code of Business Ethics & Conduct, Anti-Bribery & Anti-Corruption, Business Gift and Entertainment policy and Health and Safety policies and failure to do so shall entitle the Company to take appropriate disciplinary action which may lead & include up to termination of your internship with HCL at any time without notice. Copy of such policies is accessible through www.myhcl.com or you can also contact your HR Partner.

19. You would be required to submit the below stated documents on the date of your reporting for your internship.

- a) Qualification certificates
- b) Date of birth certificate
- c) Photographs – 7 no's
- d) Copy of ID Card / Passport.
- e) Proof of your education with <name of university>
- f) Letter from University recommending you for internship.

Sagar Kumar Lo

HCL TECHNOLOGIES LTD.

Corporate Identity Number: L74140DL1991PLD046369:

Technology Hub, Special Economic Zone

Plot No : 3A, Sector 126, NOIDA 201 304, UP, India:

T +91 120 6125000 F +91 120 4683030

Registered Office: 806 Siddharth, 96, Nehru Place, New Delhi-110019, India:

www.hcltech.com

www.hcl.com

If all the above terms and conditions of internship are acceptable to you, please confirm your acceptance by signing and returning to us the duplicate of this Internship letter.

No commitments other than what is mentioned in this Internship Agreement will be applicable to you or entertained by us.

I accept the above terms & conditions

Student's Name: Sagar Kumar Lo

Signature : *Sagar Kumar Lo*

Date : 4/12/2020

HCL TECHNOLOGIES LTD.
Corporate Identity Number: L741400L1991PLC046369
Technology Hub, Special Economic Zone
Plot No. 3A, Sector 12B, NOIDA 201 304, UP, India.
T +91 120 6125000 F +91 120 4683030
Registered Office: 806 Siddharth, 96, Nehru Place, New Delhi-110019, India.
www.hcltech.com
www.hcl.com

2nd December, 2020

Sandipan Dey
39/C Dr. M. N. Saha road

Re.: **Internship with HCL Technologies Limited**

Dear **Sandipan Dey**,

Congratulations!

This is in response to your application for internship dated **7th December, 2020**.

We are pleased to offer you an internship in **HCL Technologies Limited** ("HCL" or "Company").

You are required to report to **Priyanko Mitra** at the following Address **HCL Technologies Ltd, Kolkata-SEZ, Rajarhat, DH Street** on **7th December, 2020** at 9:00 AM.

The internship shall be governed by the terms and conditions as laid down hereunder in this internship agreement as stated in **ANNEXURE 1**.

We extend a warm welcome to you as an 'intern' in our establishment.

For **HCL Technologies Limited**,



Amrita Das
Vice President, Head-Global Rewards

Sandipan Dey.

HCL

Internship Agreement - ANNEXURE 1

1. The duration of your internship would be **6 months**. Your internship shall come to an automatic end on **7th June, 2021**. Please note that this internship is not an offer for employment by the Company and doesn't create any employer and employee relation and neither of us intends any employment relationship to be created either now or at any time in the future, accordingly regulations governing employment with the Company will not apply to you.
2. As an intern, your position shall always be that of a 'learner', who is conducting an organizational study, while the Company shall hold the position of a 'teacher' or 'instructor'.
3. During your internship with the Company, you will be paid a stipend of **INR 12,000** per month, subject to deductions as per applicable tax laws.
4. You will be off on all weekends, public holidays as per the published Holiday calendar for **HCL Technologies Limited**, accessible through **www.myhcl.com**. You may take personal leaves in exigencies and you should keep your mentor and HR Partner informed.
5. During the internship, you would be required to conduct the study during the normal working hours from **9:00 am to 6:30 pm** on Mondays to Fridays. You may also be required to attend trainings in shifts as permitted by law. The shifts and timings are subject to change and will be communicated to you from time to time.
6. The company expects you to undertake, attend and complete your internship with high standards of integrity and to maintain appropriate standards of behavior at all times.
7. Your continuation in internship shall be subject to the satisfactory verification of your credentials, testimonials, etc. and the details given by you in your Application Form/ Declaration. Your internship shall be liable to be terminated summarily if it is found at any time that you have concealed any material information or given any false information/ particulars or convicted of or pleaded guilty of any offence or crime.

Sandipam Dey.

HCL TECHNOLOGIES LTD.

Corporate Identity Number: L74140DL1991PL0048369

Technology Hub, Special Economic Zone

Plot No. 3A, Sector 12B, NOIDA 201 304, UP, India.

T +91 120 6125000 F +91 120 4683030

Registered Office: 806 Siddharth, 96, Nehru Place, New Delhi-110019, India.

www.hcltech.com

encl: 03/2017

For the avoidance of doubt, your signature in this Letter constitutes your express authorization to the Company (or the appointed third party) to conduct a background investigation on your credentials, as may be necessary.

8. You will be required to maintain utmost secrecy and shall not divulge or disclose to anyone in any manner, particulars or details of any information or data that you may come to possess by virtue of your association with the Company, including details of the trade secrets, manufacturing or research process, financial, administrative and /or organization matter or any transaction or affairs of the Company of confidential nature.
9. You are expected to acquaint yourself with the governance related Company policies which are available at the Company's online portal or may be acquired from the HR representatives at the respective premises. If at any time in the opinion of the Company, you are found to be guilty of fraud, dishonesty, disobedience, disorderly behaviour, negligence, indiscipline, or any other conduct considered by to be deterrent to the Company's interest or of violation of one or more terms of this internship letter, the Company reserves the right to terminate your internship without notice. The decision of the Company in this regard shall be final.
10. All inventions, discoveries, improvements, copyrightable material, trademarks ideas and concepts and other intellectual property rights that you may make or conceive, either solely or jointly with others, during the period of your internship, shall be deemed to be the exclusive property of the Company and you hereby waive any and all rights, title or interest, if any, in the same in favour of the Company. Further, it is expected that you to promptly reduce to writing and disclose to the Company all such inventions, discoveries, improvements, copyrightable material, trademarks ideas and concepts and other intellectual property rights, which you may make or conceive during the internship.
11. You will be responsible for safekeeping and return in good condition and order of all Company assets, which may be in your use, custody or charge; failing which the Company shall be entitled to recover the costs of the same from you.

Sandipan Dey.

HCL TECHNOLOGIES LTD.

Corporate Identity Number: L74140DL1991PLC046369

Technology Hub, Special Economic Zone

Plot No: 3A, Sector 126, NOIDA 201 304, UP, India.

T: +91 120 6125000 F: +91 120 4683030

Registered Office: 606 Sadharn, 96, Nehru Place, New Delhi-110019, India.

www.hcltech.com

www.hcl.com

12. You expressly agree and undertake to fully indemnify, compensate and hold the Company harmless from and against any and all claims, demands, damages, injuries, expenses and liability arising directly or indirectly from your acts or omissions. You further agree that you will defend at your own expense and will indemnify and hold the Company harmless from and against any and all damages, demands, expenses, claims, liability, injuries, suits and proceedings asserted or brought against the Company on a claim that any material, software or other writings or articles developed by you for the Company during the course of your internship with the Company constitutes and infringement of any patent, copyright or other third party intellectual property right.
13. Your continuance on this internship with the Company is subject to your remaining physically and mentally fit. You are expected to undergo medical examination as per the directions of the Company, if required unless prohibited under law.
14. The Company is an equal opportunities Company and has a detailed equal opportunities policy, a copy of which is available at our internal portal. You are required to read the policy and take all necessary steps to ensure that it is properly observed. Failure to comply with the terms of the policy may result in disciplinary action and, in serious cases, termination of internship.
15. Data Protection : You shall at all times be under a duty to provide and update the Company with your personal particulars, including but not limited to residential address, residential telephone number, mobile phone number, identity card number, driving licence number, income tax reference number, name(s), date(s) of birth and contact details of spouse, next of kin, and children.
16. You consent to the Company monitoring and recording any use that you make of the Company's electronic communications systems for the purpose of ensuring that the Company's rules are being complied with and for legitimate business purposes. You shall comply with any electronic communication systems policies, if any, that the Company may issue from time to time.

Sandipan Dey.

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Registered Office: 806 Siddharth, 96, Nehru Place, New Delhi-110019, India.

www.hcltech.com

© 2019 HCL LTD.

17. Right to search

- a) The Company reserves the right to search you or any of your property held on the Company's premises, at any time, if the Company believes that you are under the influence of alcohol or restricted drugs or carry a weapon, which could be hazardous to other occupants of the premises or if it believes that you may have committed a criminal offence.
- b) The Company may take assistance of the local government agencies or any other authorized agency for conducting the necessary search as stated above.
- c) If you refuse to comply with the Company's search procedure, such refusal will be treated as misconduct and will entitle the Company to take disciplinary action.
- d) If you use your personal laptop or phone for office purposes, the Company has the right to inspect, take a back-up of the data, and/or submit the laptop and/or phone for forensic analysis on ground of any suspicion or misconduct.

18. Further, during the period of your internship with HCL, you will be required to inter alia comply with the Company's Code of Business Ethics & Conduct, Anti-Bribery & Anti-Corruption, Business Gift and Entertainment policy and Health and Safety policies and failure to do so shall entitle the Company to take appropriate disciplinary action which may lead & include up to termination of your internship with HCL at any time without notice. Copy of such policies is accessible through www.myhcl.com or you can also contact your HR Partner.

19. You would be required to submit the below stated documents on the date of your reporting for your internship.

- a) Qualification certificates
- b) Date of birth certificate
- c) Photographs – 7 no's
- d) Copy of ID Card / Passport.
- e) Proof of your education with <name of university>
- f) Letter from University recommending you for internship.

Sandipan Dey.

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www.hcl.com

If all the above terms and conditions of internship are acceptable to you, please confirm your acceptance by signing and returning to us the duplicate of this Internship letter.

No commitments other than what is mentioned in this Internship Agreement will be applicable to you or entertained by us.

I accept the above terms & conditions

Student's Name: SANDIPAN DEY

Signature : Sandipan Dey.

Date : 09/12/2020

HCL TECHNOLOGIES LTD.

Corporate Identity Number: L74140DL1991PLC045369

Technology Hub, Special Economic Zone

Plot No - 3A, Sector - 126, NOIDA 201 304, UP, India

T +91 120 6125000 F +91 120 4683030

Registered Office: 808 Siddharth, 96, Nehru Place, New Delhi-110019, India

www.hcltech.com

www.hcl.com

2nd December, 2020

Abhishek Roy
Near Sukanta Sangha Club,
Purbachal, pin-700124

Re.: Internship with HCL Technologies Limited

Dear **Abhishek Roy**,

Congratulations!

This is in response to your application for internship dated 7th December, 2020.

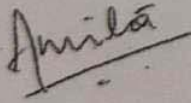
We are pleased to offer you an internship in **HCL Technologies Limited** ("HCL" or "Company").

You are required to report to **Priyanko Mitra** at the following Address **HCL Technologies Ltd, Kolkata-SEZ, Rajarhat, DH Street** on 7th December, 2020 at 9:00 AM.

The internship shall be governed by the terms and conditions as laid down hereunder in this internship agreement as stated in **ANNEXURE 1**.

We extend a warm welcome to you as an 'intern' in our establishment.

For HCL Technologies Limited,



Amrita Das
Vice President, Head-Global Rewards

Abhishek Roy

HCL

HCL TECHNOLOGIES LTD.

Corporate Identity Number: L74180DL1991PLC046369

Technology Hub, Special Economic Zone

Plot No. 3A, Sector 12B, NOIDA 201 304, UP, India

T +91 120 6125000 F +91 120 4683030

Registered Office: 806 Saksharthi, 96, Nehru Place, New Delhi-110019, India.

www.hcltech.com

www.hcl.com

Internship Agreement - ANNEXURE 1

1. The duration of your internship would be **6 months**. Your internship shall come to an automatic end on **7th June, 2021**. Please note that this internship is not an offer for employment by the Company and doesn't create any employer and employee relation and neither of us intends any employment relationship to be created either now or at any time in the future, accordingly regulations governing employment with the Company will not apply to you.
2. As an intern, your position shall always be that of a 'learner', who is conducting an organizational study, while the Company shall hold the position of a 'teacher' or 'instructor'.
3. During your internship with the Company, you will be paid a stipend of **INR 12,000** per month, subject to deductions as per applicable tax laws.
4. You will be off on all weekends, public holidays as per the published Holiday calendar for **HCL Technologies Limited**, accessible through **www.myhcl.com**. You may take personal leaves in exigencies and you should keep your mentor and HR Partner informed.
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Abhishek Roy

HCL

HCL TECHNOLOGIES LTD.

Corporate Identity Number: L74140DL1991PLC346369

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T +91 120 6125000 F +91 120 4683030

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Abhishek Roy

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T +91 120 6125000 F +91 120 4683030

Registered Office: 80F Siddharth, 06, Nehru Place, New Delhi-110019, India

www.hcltech.com

hr@hcl.com

12. You expressly agree and undertake to fully indemnify, compensate and hold the Company harmless from and against any and all claims, demands, damages, injuries, expenses and liability arising directly or indirectly from your acts or omissions. You further agree that you will defend at your own expense and will indemnify and hold the Company harmless from and against any and all damages, demands, expenses, claims, liability, injuries, suits and proceedings asserted or brought against the Company on a claim that any material, software or other writings or articles developed by you for the Company during the course of your internship with the Company constitutes and infringement of any patent, copyright or other third party intellectual property right.
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Abhishek Roy

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www.net.com

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19. You would be required to submit the below stated documents on the date of your reporting for your internship.

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- b) Date of birth certificate
- c) Photographs – 7 no's
- d) Copy of ID Card / Passport.
- e) Proof of your education with <name of university>
- f) Letter from University recommending you for internship.

Abhishek Roy

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www.hcltech.com

If all the above terms and conditions of internship are acceptable to you, please confirm your acceptance by signing and returning to us the duplicate of this Internship letter.

No commitments other than what is mentioned in this Internship Agreement will be applicable to you or entertained by us.

I accept the above terms & conditions

Student's Name: ABHISHEK ROY

Signature : Abhishek Roy

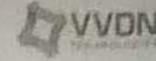
Date : 4/12/2020

Registered Office:
VVDN Technologies Pvt Ltd
12/10, East Patel Nagar,
Delhi - 110008, India

Corporate Office:
B-22, Infocity Sector-34,
Gurgaon-122001,
Haryana, India
Tel No: +91 124 4284290
Fax No: +91 124 4284251

Website:
www.vvdntech.com
Email:
info@vvdntech.com

CIN:
U72200HR2007PTC181615



INTERNSHIP LETTER

HR/IL/2020/12/5406

Date: 30-12-2020

Name of the Candidate : Arpan Das
Place of Joining : Bhubaneswar
Internship Start Date : Jan 4th, 2021

Dear Arpan Das

With reference to your interview you had with us, we are pleased to offer you the position of Intern in VVDN Technologies Pvt. Ltd (hereinafter referred to as "VVDN" or "Company") on the following terms and conditions:

33. Upon successful completion of your Internship and submission of all necessary document of your completion of Degree, you will be given the status of a permanent employee and you will be given a CTC of Rs. 3.2 L Per Annum.
34. The internship will be for Five days a week. This is **subject to any change or requirement** that may come into force in future. Such changes will supersede all the relevant clauses mentioned in this offer letter.
35. You will be in a On the Job training period for the first 6 months from the day of your onboarding with us. During this period, if the Company finds the performance and discipline of the trainee is not satisfactory, appropriate action will be taken.
36. You will be required to execute Confidentiality Agreement, Terms and Conditions of Internship and such other documents/ undertakings/ agreements as may be required by VVDN from time to time.
37. Any discovery, invention, improvement, adaptation or variation of designs, drawings, processes, methods, material specifications, etc., which will be a result of your training in VVDN or its associates, or which you may come to know in the course of your Training, more specifically in relation to the engineering or technology used or adopted by VVDN, shall be the property of VVDN. You shall treat the above information or data in connection with any work done in VVDN strictly confidential. You shall not use, give or sell any or all of the information to any other person or firm for exploitation, for gain or otherwise.
38. All information, papers, correspondence, etc., pertaining to VVDN business activities, commercial, technical or otherwise coming into your possession in the course of your training shall be treated strictly confidential.
39. During your training with VVDN, you may be transferred to any of the Offices/ Departments/ Units of VVDN or of associate concerns whether existing or to be set up, basis any business requirement, anywhere in India or abroad, on the same terms and conditions of Internship at the sole discretion of the management.
40. **Leave:** Regular full-time employees will have planned and unplanned leaves as per the VVDN Leave Policy whereas if you join as an Intern/ Trainee, you will be entitled to get one unplanned leave in a month on pro rata basis. Please refer leave policy for more details.
41. During your tenure with VVDN, you will be governed by the Service Rules and regulations of VVDN currently in force or as introduced/awarded from time to time.
42. Either party can terminate this internship by intimating 30 days in advance.

Corporate Office: B-22, Sector - 34, Infocity, Gurgaon, Haryana - 122001, India

Registered Office: 12/10 East Patel Nagar, New Delhi - 110008, India

www.vvdntech.com | Email: info@vvdntech.com

Registered Office:
VVDN Technologies Pvt Ltd
12/10, East Patel Nagar,
Delhi - 110008, India

Corporate Office:
B-22, Infocity Sector-34,
Gurgaon-122001,
Haryana, India
Tel No: +91 124 4284250
Fax No: +91 124 4284251

Website:
www.vvdntech.com
Email:
info@vvdntech.com

CIN:
U72200DL2007PTC162619



43. You have been enrolled on the presumption that the particulars furnished by you are correct. In the event the said particulars are found to be incorrect or that you have concluded or withheld some other relevant facts, your internship with VVDN shall stand terminated/ cancelled without any notice.
44. You will diligently carry out, to the best of your ability all such duties and responsibilities as may be entrusted to you from time to time and you shall not engage yourself either directly or indirectly in any other employment, business or occupation other than your On the Job Training curriculum.
45. Your email acceptance of this letter is expected within 3 days from the date of releasing the offer letter. This offer shall become void after completion of 3 days in-case no acceptance is received from the candidate.
46. As per the business requirements, company can ask for short-term or long-term travel/ deployment to any of the work location in India or abroad.
47. Any interim voluntary or involuntary drop out cases will not be considered for any settlements and internship certificates. The internship certificate will be given for such trainees who will not be able to continue VVDN due to observed performance issues during internship
48. In any such case, where trainee wants to leave the training or absconds or performs not as per the expectations due to which his confirmation of the services doesn't happen, trainees are liable to pay the training expenses as recovery which is not only limited to the six months stipend amount but also up to a sum of Rs. 2,00,000/- towards training cost, irrespective of the internship duration.

Please Sign the duplicate copy of this letter and return the same as token of your acceptance [Acceptance is through email or signatures] of the terms and conditions detailed in the letter.

On the day of your joining, please bring original and photocopies of the following for verification:

- Pan Card
- Aadhar Card
- 2 Color photographs, passport size
- 10th Certificate
- 12th Certificate
- All semester mark-sheets & Degree certificate
- NOC Letter from college for Internship
- Passport (Passport is mandatory at the time of joining. In case you do not possess a valid passport, we want you to apply for it in advance and submit the copy of application to HR department within one month of your joining)

Wishing you a rewarding career with VVDN and welcoming you to our Pursuit of Excellence.

Yours sincerely,

For VVDN Technologies Pvt. Ltd.

Name of the Intern: Arpan Das

Authorized Signatory

Signature: Arpan Das

Corporate Office: B-22, Sector - 34, Infocity, Gurgaon, Haryana - 122001, India
Registered Office: 12/10 East Patel Nagar, New Delhi - 110008, India
www.vvdntech.com | Email: info@vvdntech.com

International Workshop on Emergency Response Technologies and Services

in conjunction with ICDCN 2021
Nara Kasugano International Forum IRAKA, Nara, Japan

About the Workshop

The goal of the 3rd International Workshop on Emergency Response Technologies and Services (EmeRTes) 2021 is to bring together researchers and practitioners from academia, government, NGO and industry in areas related to disaster management in order to gain experience and insight into the challenges that such environments pose for the people. The workshop is dedicated to the dissemination of original contributions that discusses solutions required to combat disaster situation.

Call for Papers

We expect submission from a wide ranging discipline and expect the workshop to be a meeting point for cross-discipline discussion whereby various facets of disaster management would get highlighted. Topics of interest include, but are not limited to:

1. Human Experiences in the Design of Crisis Response and Management Services and Systems

- Planning, Foresight and Risk Analysis
- Social Media and Collaborative Systems
- Dynamics of Need Analysis, Monitoring and Assessment
- Emergency and Disaster Prediction
- Collaborative decision-making
- Social Science aspects of Emergency Response and Disaster Management

2. Distributed Systems for Disaster Management

- Collaborative information systems architectures, technologies, and algorithms for crisis management
- Cooperative communication in Disaster Management
- Context awareness for distributed resource management
- Architectures, Middleware, Prototypes and Test-beds for Distributed Disaster Management
- Reliability, resilience and fault tolerance techniques in distributed environment
- Distributed Decision Support Methods for Complex Crisis
- Crowdsourcing platform for disaster preparedness and post disaster rescue/relief operation

3. Enabling Technologies and Systems

- Social Networking for Crisis Management
- Post disaster damage and loss assessment
- Geographical Information Systems for Crisis Response and Management

- Early Warning and Alerting Systems,
- Ad-Hoc Mobile Networks
- Opportunistic and Delay Tolerant Networks
- Data gathering, Fusion, Routing, Dissemination and Caching in Delay Tolerant Network/ Opportunistic networks
- Security, Trust, Privacy and Cooperation issues in Delay Tolerant Network/ Opportunistic networks
- Mobility models
- Interfaces and Methods for Interconnection of Heterogeneous Networks and Devices
- System Architectures, Resource Discovery, Retrieval, Scheduling, Allocation, Monitoring
- Heterogeneous Wireless Connectivity Management
- Community participation in emergency management

Paper Submission Guidelines

Authors are welcome to submit regular papers (6 pages, PDF format) describing original ideas written in English, including title, abstract, figures and references, and not published or under review elsewhere. Also, papers must be formatted with ACM conference proceedings template <https://www.acm.org/publications/proceedings-template>.

For each accepted workshop paper to appear in the ACM digital library, at least one author of the paper must register as a regular registrant even if he/she is a student, and the paper must be presented in the workshop by one of its authors. Papers must be submitted electronically in printable PDF form via the EasyChair page here: <https://easychair.org/conferences/?conf=icdcn2021>.

Important Dates

Paper Submission:	September 20, 2020
Notifications:	October 10, 2020
Camera Ready:	October 20, 2020
Workshop Date:	January 05, 2021

Organizers

Workshop Chairs

- Somprakash Bandyopadhyay, Indian Institute of Management Calcutta, India
- Sajal Das, Missouri University of Science and Technology, USA

TPC Co-Chairs

- Simone Silvestri, University of Kentucky, USA
- Siuli Roy, Heritage Institute of Technology, Kolkata, India

Organizing Chair

- Souvik Basu, Heritage Institute of Technology, Kolkata, India

Contact Details

For any further query mail to souvik.basu@heritageit.edu
or call +919903998511

Workshop Website

<https://sites.google.com/view/emertes2021>

From: **Mrinal Das** <mrinal.ecoe@gmail.com>

Date: Fri, Dec 20, 2019 at 2:31 PM

Subject: Onboarding of Madhurima Mukherjee in NIST-ECO E

To: Ajit Kumar Panda <akpanda62@hotmail.com>

Cc: krishanu datta <krishanu.datta@heritageit.edu>, <madhurimamukherjee2@gmail.com>

Sir ,

This is to confirm we can go ahead with internship for Madhurima Mukherjee for six months starting 2nd January , 2020 . Stipend will be 12500/- per month.

Kindly enable the offer letter regarding the same , so that she can arrange for relocation to Bhubaneswhar .

Regards,
Mrinal

--

Mrinal Das

Founder

Electronic Center of Excellence

+91-7381974602

Presentation to C-DAC of ongoing Vision research work at HIT, ECE department

Inbox



anindya sen <anindya.sen@heritageit.edu>

May 16,
2019, 12:17
PM

to Nabarun, Subhankar

To,
Dr. Nabarun Bhattacharya,
Senior Director & Centre Head,
Centre for Development of Advanced Computing (C-DAC)
Ministry of Communication & Information Technology
Government of INDIA,
E-2/1, Block- GP, Sector – V,
Salt Lake, Kolkata – 700091,
West Bengal, INDIA.

16-5-2019

Subject: Presentation on ongoing Vision research work at HIT, ECE department

Dear Sir,

As per our discussion on Monday 13-5-2019, I am glad to share information about the ongoing vision research work at Heritage Institute of Technology, ECE department. The present work is realized by two final year group of students as a part of their final year projects under my supervision. Brief details are provided below for your kind review.

Group1: A 2018 project group of students did excellent research work on Glaucoma producing a Conference and a Journal paper. The group requests a convenient date between 20th, to 30th May, to present their work in a thirty minute presentation. A morning session would be preferable as they may have to take leave to come and present from their individual local work places.

Project Title:

Automatic Evaluation and Predictive Analysis of Optic Nerve Head for the Detection of Glaucoma

Members:

Kaushik Dutta, Rishav Mukherjee, Shamik Kundu, Tanmay Biswas and Anindya Sen
Department of Electronics and Communication Engineering.
Heritage Institute of Technology, Kolkata

Publications: Conference and a journal paper

[1]. Kaushik Dutta, Rishav Mukherjee, Shamik Kundu, Tanmay Biswas, Anindya Sen
“Automatic Evaluation and Predictive Analysis of Optic Nerve Head for the Detection of Glaucoma,” 2018 2nd International Conference on Electronics, Materials Engineering & Nano-Technology (IEMENTech), May 4-5, 2018.

[2]. Rishav Mukherjee, Shamik Kundu, Kaushik Dutta, Somnath Majumdar, Anindya Sen,
“Predictive Diagnosis of Glaucoma based on Analysis of Focal Notching along the Neuro-retinal rim using Machine Learning,” Pattern Recognition and Image Analysis in Mathematical Theory and Applications (Accepted for publication in August 2019)

Group 2: Our current 2019 batch of students has done excellent work on diabetic retinopathy. The group requests a convenient date between 29th, to 31st May, to present their work in a thirty minute presentation, after their ongoing final examinations.

Project Title:

"Automatic detection of features in retinal fundus images for non proliferative diabetic retinopathy"

Team Members : Ankit Bhattacharya Arnab Acharyya Sayantan Mukherjee Subhojit Roy Bardhan

Project Guide: Anindya Sen

If allowed to present these two works, we shall look forward to your kind review, observation, and would treasure any valuable comments that would fruitfully guide our research to be more effective socially and be beneficial to the common people in the best interest of our country.

Best Regards

Anindya Sen, Ph.D.

Professor, ECE Department

Heritage Institute of Technology

M: 9831463470



Subhankar Mukherjee <subhankar.mukherjee@cdac.in>

May 17,
2019, 12:48
PM

to Souvik, Alokesh, me, Nabarun

Dear Sir,

Thank you very much for your email and showing your interest to share your innovation with us towards production worthy prototype development, deployment and commercialization.

We are keen to know about your innovations on mentioned areas. 27th May (Monday) at 11:45 h. will be preferable for us.

Looking forward to your kind confirmation.

With thanks and regards,
Subhankar

Disclaimer:

This e-mail contains confidential information belonging to Heritage Institute of Technology & is intended solely for the Addressee. The unauthorized disclosure, use dissemination or copying (either whole or partial of this e-mail, or any information it contains), is prohibited. E-mail is susceptible to alteration and their integrity cannot be guaranteed. Heritage Institute of Technology shall not be liable for this e-mail if modified or falsified. If you are not the intended recipient of this e-mail, please delete it immediately from your system & notify the sender of the wrong delivery and the mail deletion.

Thank you,

With highest regards,
Subhankar.

SUBHANKAR MUKHERJEE
PROJECT ENGINEER
Agri and Environmental Electronics Group
Centre for Development of Advanced Computing (C-DAC)
Ministry Of Electronics & Information Technology (MeitY)
Government of India
E-2/1, Block - GP, Sector - V
Salt Lake, Kolkata - 700091
West Bengal, India

Contact:

Ph: +91-33-2357-5989 (Ext:298)

Mob- +91 - 94773-55692

Fax : + 91 - 33 - 2357 5141

E-Mail: subhankar.mukherjee@cdac.in; subhankarm8585@gmail.com

Website: **MailScanner has detected a possible fraud attempt from "www.cdackolkata.in" claiming to be www.cdac.in**

SANKALP SEMICONDUCTOR PRIVATE LIMITED

INTERN/PROJECT TRAINEE CONFIDENTIALITY AGREEMENT

In consideration of my Internship/Project with Sankalp Semiconductor Private Limited. (The "Company"), I hereby agree as follows:

1. RECOGNITION OF COMPANY'S RIGHTS; NONDISCLOSURE.

At all times during the term of my internship/project and thereafter, I will hold in strictest confidence and will not disclose, use, lecture upon or publish any of the Company's Proprietary Information (defined below), except as such disclosure, use or publication may be required in connection with my work for the Company, or unless an executive officer of the Company expressly authorizes such in writing. The term "Proprietary Information" shall mean trade secrets, confidential knowledge, data or any other information of the Company. By way of illustration but not limitation, "Proprietary Information" includes (a) inventions, mask works, trade secrets, ideas, processes, formulas, source and object codes, data, programs, other works of authorship, know-how, improvements, discoveries, developments, designs and techniques (hereinafter collectively referred to as "Inventions"); and (b) information regarding plans for research, development, new products, regulatory matters, marketing and selling, business plans, budgets and unpublished financial statements, licenses, prices and costs, suppliers and customers; and information regarding the skills and compensation of other employees of the Company.

2. THIRD PARTY INFORMATION.

I understand, in addition, that the Company has received, and in the future will receive, from third parties confidential or proprietary information ("Third Party Information") subject to a duty on the Company's part to maintain the confidentiality of such information and to use it only for certain limited purposes. During the term of my internship/project and thereafter, I will hold Third Party Information in the strictest confidence and will not disclose to anyone (except in connection with my work for the Company), unless expressly authorized by an executive officer of the Company in writing.

3. ASSIGNMENT OF INVENTIONS.

3.1 ASSIGNMENT.

I hereby assign to the Company all my right, title and interest in and to any and all Inventions (and all patent rights, copyrights, mask work rights, trademarks, trade secret rights, all other rights throughout the world in connection therewith, and the goodwill associate with all of the foregoing (collectively, "Proprietary Rights"), whether or not patentable or registrable under patent, copyright, trademark or similar statutes, made or conceived or reduced to practice or learned by me, either alone or jointly with others, during the period of my internship/project with the Company. Inventions assigned to, or as directed by, the Company under this Paragraph 3 are hereinafter referred to as "Company Inventions." I agree, upon request, to execute, verify and deliver assignments of the Proprietary Rights to the Company or its designee and I hereby appoint the Company my attorney-in-fact with respect to the Proprietary Rights for the purpose of effecting any or all of the Company's rights to and use of the Proprietary Rights.

WAIVER OF CLAIMS

I hereby waive any and all claims, of any nature whatsoever, which I now or may hereafter have for infringement of any Proprietary Rights assigned by me to the

Company pursuant to this Internship/Project Confidentiality Agreement. (the "Agreement").

4. COVENANT NOT TO SOLICIT OR COMPETE.

4.1 RESTRICTIVE COVENANTS.

(a) I agree that during the period of my internship/project by the Company I will not, without the Company's prior written consent, engage in any employment or business activity other than for the Company. I further agree that during the term of my internship/project with the Company, I shall not solicit, or arrange to have any other person or entity solicit, any person or entity engaged by the Company as an employee, customer, supplier, or consultant or advisor to the Company to terminate such party's relationship with the Company.

4.2 DEFINITION OF BUSINESS; COVENANT TO AGREE.

For purposes of Section 4.1 above, the term "Business" shall mean the research, development, manufacture, distribution, license and commercialization of **Analog & Mixed Signal Technology**.

5. NO IMPROPER USE OF MATERIALS.

During my internship/project with the Company, I will not improperly use or disclose any confidential information or trade secrets, if any, of any former employer or any other person to whom I have an obligation of confidentiality, and I will not bring onto the premises of the Company any unpublished documents or any property belonging to any former employer or any other person to whom I have an obligation of confidentiality unless consented to in writing by that former employer or person.

Use of any Company assets for unlawful, immoral or unethical purpose is strictly prohibited.

6. NO CONFLICTING OBLIGATION; NO MISREPRESENTATION

I represent that my performance of all the terms of this Agreement and my performance of my duties as an intern/project trainee of the Company do not and will not breach any agreement to keep in confidence information acquired by me in confidence or in trust prior to my internship/project with the Company. I have not entered into, and I agree I will not enter into, any agreement either written or oral in conflict herewith. I further agree that I will not misrepresent in any manner, my title or the nature of my current role and responsibilities to any potential or future employer.

7. RETURN OF COMPANY DOCUMENTS.

When I complete the internship/project with the Company, I will deliver to the Company any and all drawings, notes, memoranda, specifications, devices, formulas, storage media, including software, documents and computer printouts, together with all copies thereof, and any other material containing or disclosing any Inventions, Third Party Information or Proprietary Information of the Company. I further agree that any property situated on the Company's premises and owned by the Company, including disks and other storage media, filing cabinets or other work areas, is subject to inspection by Company personnel at any time with or without notice.

8. LEGAL AND EQUITABLE REMEDIES.

Because my services are personal and unique and because I may have access to and may become acquainted with the Proprietary Information of the Company, the Company shall have the right to enforce this Agreement and any of its provisions by injunction, specific performance or other equitable relief,

without bond, without prejudice to any other rights and remedies that the Company may have for a breach of this Agreement, and I waive the claim or defense that the Company has an adequate remedy at law. I shall not, in any action or proceeding to enforce any of the provisions of this Agreement, assert the claim or defense that such an adequate remedy at law exists.

9. NOTICES.

Any notices required or permitted hereunder shall be given to me at the address specified below or at such other address as I shall specify in writing. Such notice shall be deemed given upon personal delivery to the appropriate address or if sent by certified or registered mail, three days after the date of mailing.

10. GENERAL PROVISIONS.

10.1 GOVERNING LAW.

This Agreement is executed under seal and will be governed by and construed according to the laws of the Government of India.

10.2 ENTIRE AGREEMENT.

This agreement is the final, complete and exclusive agreement of the parties with respect to the subject matter hereof and supersedes and merges all prior discussions between us. No modification or amendment of this Agreement, nor any waiver of any rights under this Agreement, will be effective unless in writing signed by the party to be charged. Any subsequent change or changes in my role will not affect the validity or scope of this Agreement. As used in this Agreement, the period of my internship/project includes any time during which I may be retained by the Company as a intern/project trainee.

10.3 SEVERABILITY.

If one or more of the provisions in this Agreement are deemed unenforceable by the law, then the remaining provisions will continue in full force and effect.

10.4 SUCCESSORS AND ASSIGNS.

This Agreement will be binding upon my heirs, executors, administrators and other legal representatives and will be for the benefit of the Company, its successors, and its assigns. I may not assign any of my rights, or delegate any of my obligations, under this Agreement.

10.5 SURVIVAL.

The provisions of this Agreement shall survive the termination of my internship/project and the assignment of this Agreement by the Company to any successor in interest or other assignee.

10.6 CONTINUATION OF INTERNSHIP/PROJECT.

I agree and understand that nothing in this Agreement shall confer on me any right with respect to continuation of my internship/project with the Company, nor shall it interfere in any way with my right or the Company's right to terminate my internship/project at any time, with or without cause.

10.7 WAIVER

No waiver by the Company of any breach of this Agreement shall be a waiver of any preceding or succeeding breach. No waiver by the Company of any right under this Agreement shall be construed as a waiver of any other right. The Company shall not be required to give notice to enforce strict adherence to all terms of this Agreement.

10.8 JURISDICTION AND VENUE; WAIVER OF JURY TRIAL.

This Agreement will be governed by and interpreted in accordance with the Laws of Indian Union and will be subject to the jurisdiction of the Courts of Bangalore.

10.9 DISCLOSURE.

I agree that the Company may, provide a copy of this Agreement to any business or enterprise (i) which I may directly or indirectly own, manage, operate, finance, join, control or participate in the ownership, management, operation, financing, or control of, or (ii) with which I may be connected with as an officer, director, employee, partner, principal, agent, representative, consultant or otherwise, or in connection with which I may use or permit my name to be used. I agree that I will provide the names and addresses of any such persons or entities as the Company may from time to time reasonably request.

I UNDERSTAND THAT THIS AGREEMENT AFFECTS MY RIGHTS TO INVENTIONS I MAKE DURING MY INTERNSHIP/PROJECT, AND RESTRICTS MY RIGHTS TO DISCLOSE OR USE THE COMPANY'S CONFIDENTIAL INFORMATION OR TO COMPETE WITH THE COMPANY DURING OR SUBSEQUENT TO MY INTERNSHIP/PROJECT.

I HAVE READ THIS AGREEMENT CAREFULLY AND UNDERSTAND ITS TERMS.

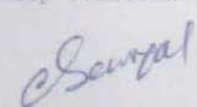
INTERN/PROJECT TRAINEE

Signature: 

Name: SOHOM DAS

Dated: 13.09.2019

ACCEPTED AND AGREED TO:
Sankalp Semiconductor Private Limited


Name: Venkatesh M (on half).
Designation: Manager-HR

International Workshop on Emergency Response Technologies and Services

in conjunction with ICDCN 2020
Hotel Hindustan International, Kolkata, India

About the Workshop

The goal of the 2nd International Workshop on Emergency Response Technologies and Services (EmeRTes) 2020 is to bring together researchers and practitioners from academia, government, NGO and industry in areas related to disaster management in order to gain experience and insight into the challenges that such environments pose for the people. The workshop is dedicated to the dissemination of original contributions that discusses solutions required to combat disaster situation.

Call for Papers

We expect submission from a wide ranging discipline and expect the workshop to be a meeting point for cross-discipline discussion whereby various facets of disaster management would get highlighted. Topics of interest include, but are not limited to:

1. Human Experiences in the Design of Crisis Response and Management Services and Systems

- Planning, Foresight and Risk Analysis
- Social Media and Collaborative Systems
- Dynamics of Need Analysis, Monitoring and Assessment
- Emergency and Disaster Prediction
- Collaborative decision-making
- Social Science aspects of Emergency Response and Disaster Management

2. Distributed Systems for Disaster Management

- Collaborative information systems architectures, technologies, and algorithms for crisis management
- Cooperative communication in Disaster Management
- Context awareness for distributed resource management
- Architectures, Middleware, Prototypes and Test-beds for Distributed Disaster Management
- Reliability, resilience and fault tolerance techniques in distributed environment
- Distributed Decision Support Methods for Complex Crisis
- Crowdsourcing platform for disaster preparedness and post disaster rescue/relief operation

3. Enabling Technologies and Systems

- Social Networking for Crisis Management
- Post disaster damage and loss assessment
- Geographical Information Systems for Crisis Response and Management

- Early Warning and Alerting Systems,
- Ad-Hoc Mobile Networks
- Opportunistic and Delay Tolerant Networks
- Data gathering, Fusion, Routing, Dissemination and Caching in Delay Tolerant Network/ Opportunistic networks
- Security, Trust, Privacy and Cooperation issues in Delay Tolerant Network/ Opportunistic networks
- Mobility models
- Interfaces and Methods for Interconnection of Heterogeneous Networks and Devices
- System Architectures, Resource Discovery, Retrieval, Scheduling, Allocation, Monitoring
- Heterogeneous Wireless Connectivity Management
- Community participation in emergency management

Paper Submission Guidelines

Authors are welcome to submit *regular papers* (6 pages, PDF format) describing original ideas written in English. Authors are also welcome submit *short papers* (4 pages, PDF format). The accepted papers will be indexed by the ACM Digital Library. At least one author of each accepted paper (regular or short) must register for the conference and present the paper. In case of no-shows of accepted papers at the workshop will result in those papers NOT being included in the proceedings and will also not be made electronically available. Submissions should follow the [ACM proceedings formatting style](#). Papers must be submitted electronically in printable PDF form via the EasyChair page here: <https://easychair.org/conferences/?conf=emertes2020>.

Important Dates

Paper Submission:	September 27, 2019
Notifications:	October 16, 2019
Camera Ready:	October 24, 2019
Workshop Date:	January 07, 2020

Organizers

Workshop Chairs

- Somprakash Bandyopadhyay, Indian Institute of Management Calcutta, India
- Sajal Das, Missouri University of Science and Technology, USA

TPC Co-Chairs

- Simone Silvestri, University of Kentucky, USA
- Siuli Roy, Heritage Institute of Technology, Kolkata, India

Organizing Chair

- Souvik Basu, Heritage Institute of Technology, Kolkata, India

Contact Details

For any further query mail to souvik.basu@heritageit.edu
or call +919903998511

Workshop Website

<https://sites.google.com/view/emertes2020>

From: Subrata Sarkar/hpl/IN
To: admin@heritageit.edu
Cc: Debasis Sen/hpl/IN@hpl, Debabrata Burman/AUCKLAND/hpl/IN@hpl, Himadri Prasad Banerjee/hpl/IN@hpl, Priyanka Dhara/hpl/IN@hpl, Rajkumar Majumder/hpl/IN@hpl
Date: 06-06-19 03:09 PM
Subject: Matter Related to Summer Training in Haldia Petrochemicals Limited (HPL)

To
Dr. Sangita Bhattacharjee
Heritage Institute of Technology
Kolkata - 700 107

Sir / Madam,

Greetings from Haldia Petrochemicals Limited.

This has reference to your application/s for Industrial Training of your students in HPL.

We are pleased to inform you that your request has been acceded by Management and will allow training from 24.06.2019 to 19.07.2019 (4 weeks; Monday to Friday in a week excluding HPL Holidays). The following student will be allowed for training:

Umme Habiba

Please be informed that students who are currently in pre final year of their curriculum will only be considered for the said training.

It may please be noted that during the training period, we shall not be responsible for providing any assistance/support towards boarding & lodging and to & fro transport services from HPL Plant. Also stipend and accommodation facility can not be arranged from HPL side.

The students will be provided complementary lunch on the first day. From second day onwards, they will have to purchase food coupons at applicable rates.

The students may be advised to carry the following along with them.

Four copies of stamp size photograph
College Identity card in original and photocopy

On completion of their training period, they will be required to submit a report to us.

During the training, the students need to follow the rules and regulations on Health, Fire,

Environment, Safety and Code and Conduct of the Plant, failing which, the said facility of Training may be withdrawn forthwith.

Further, while at Plant, the students must report in formal working attire and covered leather shoes with rubber/PVC sole.

They are advised to report to Plant Gate No 1 and meet Ms. Priyanka Dhara (03224-222548) or the undersigned on the commencement date of training at our Plant at 8.30 am for next course of action. Those who will fail to report on the mentioned date and time without any intimation will not be considered for training.

Looking forward to your kind cooperation in this regard.

Regards,
Subrata Sarkar | Manager - Human Resource |



Haldia Petrochemicals Ltd.
PO Box No. - 12 | P.O. Durgachak |
Haldia - 721 602 | West Bengal | India
Tel: 91-3224-274 007/877/876/400/882/384
Extn. 2552 | Fax: 91-3224-274 420
Web: <http://www.haldiapetrochemicals.com/>



avijit ghosh <avijit.ghosh@heritageit.edu>

Reg: UG project title for the year of 2019-2020

avijit ghosh <avijit.ghosh@heritageit.edu>
To: jayati datta <jayati.datta@heritageit.edu>

Wed, Jul 3, 2019 at 1:40 PM

Dear Madam,

Please find below the tentative title of the project which are going to be offered to the chemical engineering UG students. The project work would be carried out jointly with the Department of Chemistry & Environment and Renewable Energy Research Lab.

- 1) Study on Electrocatalyst Performance for Alkaline Fuel Cell (AG/JD) [Students 2 nos]
- 2) Screening on Modified TIO_2 based dye-sensitized Solar Cells (DSSC) [Students 2 nos]

Kindly, let me know if any modification is required for the project title.

AG: Dr. Avijit Ghosh, ChE

JD: Prof. Jayati Datta, HoD, Chem & Env. and Hear Renewable Energy Research Centre

Wirh Kind Regards,
Avijit

Sincerely Yours,

Dr. Avijit Ghosh
Assistant Professor
Department of Chemical Engineering
Heritage Institute of Technology
Mobile NO:+91 9830752111

Screenshots of Conversation between Institute and McLeod's Pharmaceuticals Ltd. Regarding Technical Training

The screenshot shows a Gmail interface on a desktop browser. The browser tabs include 'Heritage faculty visit to MacLeod' and 'Number of Collaborative activities'. The address bar shows a search for 'McLeods+Training+report'. The search bar in Gmail contains 'McLeods Training report'. The email is from 'kaushik bhattacharya' to 'Amit, Saiddutta, sulagna, me, Purna'. The email content is as follows:

Dear Mr. Kanabar,

Thank you so much for supporting Prof. Mallick during his month-long stay and training at your Centre of Excellence!

It sure seems to have been a packed programme of collaborative learning and knowledge sharing with your colleagues and other learners.

I am sure it was a fulfilling and enjoyable experience for Prof. Mallick - and I hope it was a fruitful experience for your team as well?

Our HOD, Prof. Chatterjee, will also be taking a detailed feedback from Prof. Mallick and sharing her thoughts in due course.

Dear Mr. Nanda,

On behalf of The Heritage Group, thank you once again for facilitating this entire experience through your personal effort.

We look forward to even greater collaboration on multiple fronts between our two organisations in the coming months.

Wishing all of you at MacLeods Pharma and your families a very happy Dussehra in advance!

Thanks & Regards

Kaushik Bhattacharya
Head - Training & Placement
The Heritage Group of Institutes
994 Madurdaha, Chowbaga Road, Anandapur

The taskbar at the bottom shows various applications like Google Chrome, Microsoft Word, and PowerPoint, along with system icons for temperature (24°C) and time (15:05, 12-12-2021).

Compose

- Mail
 - Inbox 7,656
 - Starred
 - Snoozed
 - Important
 - Sent
- Chat +
- Spaces +
 - faculty
- Meet

On Mon, 30 Sep 2019 at 18:02, Amit Kanabar <amilk@macleodspharma.com> wrote:

Greetings!!!

Dear All,

Just to update, as per the schedule, Prof. Mallick has completed his training at Macleods Centre of Excellence, Sarigam on 28.09.2019 and reached back safely.

During this training, he has gone through below topics:

- Attended multiple sessions like GMP, GDP, DI, Safety, Different equipment like Reactor, Dryers etc.
- Demonstration of multiple daily activities with plant equipment in manufacturing facility.
- Calibration/verification of Balance instruments,
- Observation of Document filling activity,
- Experience of Virtual Reality Modules,
- Actively involved in Presentation/Demonstration/Poster making/quiz of trainees on different topics.
- Also, some hands on practice with valve operations etc.
- He has also visited API manufacturing blocks.
- He has also conducted one session on Distillation for our Trainees & Trainers

At last he had meeting with our API Manufacturing Plant Head for feedback and Project proposal.

Heritage faculty visit to MacLeods x Number of Collaborative activiti: x +

mail.google.com/mail/u/0/#search/McLeods+Training+report/FMfgxwDrbqjVmtpdfmfsbjrRTzjKbCP

Apps

Gmail McLeods Training report Active

Compose

Mail

- Inbox 7,655
- Starred
- Snoozed
- Important
- Sent

Chat +

Spaces +

faculty

Meet

At last he had meeting with our API Manufacturing Plant Head for feedback and Project proposal.

He has submitted **Training report** on dated 28.09.2019 and carrying 2 copies with him (1 for institute & 1 for self).

It was very interactive and knowledge sharing time duration for us.

Regards,
Amit Kanabar
Technical **Training** - HRD
Macleods Pharmaceuticals Ltd.
Head - **Macleods Centre of Excellence**, Sarigam
M: 7574881055; E-mail: amitk@macleodpharma.com

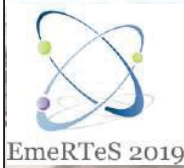
From: [sulagna chatterjee](mailto:sulagna_chatterjee)
Sent: Monday, September 02, 2019 11:41 AM
To: [kaushik bhattacharya](mailto:kaushik_bhattacharya)
Cc: Amit Kanabar ; [abhyuday mallick](mailto:abhyuday_mallick) ; Saidutta Nanda ; Purna Patro
Subject: Re: Heritage faculty visit to **Macleods training** centre - requesting some details

Mr. Kanabar

We had a good discussion over phone. Thank you for hosting Prof. Mallick. I am sure that his **training** will provide value added skills to the next batch of chemical engineering students. I am hopeful it will also set the foundation for more interaction between the department and your company.

Type here to search

Google ... Docum... Heritag... Downl... 24°C 19:07 12-12-2021



EmerTeS 2019

January 7, 2019

International Workshop on Emergency Response Technologies and Services

in conjunction with **ICDCN 2019**
Indian Institute of Science, Bangalore, India

About the Workshop

The goal of the International Workshop on Emergency Response Technologies and Services - **EmerTeS 2019** is to explore the application of new and innovative technology research towards improving emergency response and management. The focus is to provide an inter-disciplinary platform for researchers to exchange ideas, present results, share experience, stimulate new research, and foster collaborations among computer scientists, engineers, social scientists, representatives from government and non-governmental organizations and disaster science experts to develop recommendations for effective emergency response.

Call for Papers

Papers describing original research work and practical experiences/experimental results are solicited on topics that tentatively include, but are not limited to:

- Emergency communication infrastructures, technologies and services
- Peer-to-peer networks based emergency communication systems and protocols
- Modeling and simulation tools for emergency situations
- Crowd sourcing, remote sensing, cyber-physical systems for emergency response
- Coordination, collaboration and decision support systems
- Logistics and supply chain management in emergency response
- IoT based solutions for emergency response
- Querying and filtering of heterogeneous, multi-source and multi-modal situational data
- Post disaster damage and loss assessment
- Planning, foresight and risk analysis
- Security and privacy issues in situational information sharing
- Social media and networks for emergency response and management
- Web mapping and Geographic Information Systems (GIS) for emergency response
- Emergency management information systems and applications
- Community participation in emergency management

Paper Submission Guidelines

Authors are welcome to submit *regular papers* (6 pages, PDF format) describing original ideas written in English. The accepted papers will be indexed by the **ACM Digital Library**. Authors are also welcome to submit *work-in-progress papers* (2 pages, PDF format). In this case, final papers will be available to participants electronically, but to facilitate resubmission to more formal venues, no archival proceedings will be published, and papers will not be sent to the ACM Digital Library. At least one author of each accepted paper (regular or work-in-progress) must register for the conference and present the paper. In case of no-shows of accepted papers at the workshop will result in those papers NOT being included in the proceedings and will also not be made electronically available. Submissions should follow the [ACM proceedings formatting style](#). Papers must be submitted electronically in printable PDF form via the [HotCRP submission management system](#).

Organizers

Workshop Chairs

- Somprakash Bandyopadhyay, Indian Institute of Management Calcutta, India
- Sajal Das, Missouri University of Science and Technology, USA
- Sipra Das Bit, Indian Institute of Engineering Science and Technology, Shibpur, India

TPC Co-Chairs

- Simone Silvestri, University of Kentucky, USA
- Siuli Roy, Heritage Institute of Technology, Kolkata, India

Organizing Co-Chairs

- Souvik Basu, Heritage Institute of Technology, Kolkata, India
- Subrata Nandi, NIT Durgapur, India

Important Dates

Paper Submission:	September 30, 2018
Notifications:	October 30, 2018
Camera Ready:	November 15, 2018
Workshop Date:	January 07, 2019

Venue

Indian Institute of Science, Bangalore, India

Contact Details

For any further query mail to souvik.basu@heritageit.edu

Workshop Website

<https://sites.google.com/view/emertes2019>



राष्ट्रीय प्रौद्योगिकी संस्थान अगर्तला
National Institute Of Technology Agartala
Subject: Provisional Enrolment for the Ph.D. Degree

Form NITA/ACAD/PHD/6

(After DC and Supervisor is finalized)

On the recommendation of the Doctoral Committee, the Research Scholar named bellow has been provisionally enrolled for the Degree of Doctor of Philosophy (Ph.D) of the institute with the particulars mentioned hereinafter:

- a. Name of Scholar DIBYAJYOTI HALDAR
b. Deptt./Centre Chemical Engineering
c. Roll No 13ODCHR002
d. Date of Enrollment 15/07/2013
e. Category Regular
f. Supervisor Mr. DWAIPAYAN SEN , DR. KALYAN GAYEN , ,

g. Course of work to be done

Sr. No.	Semester	CCode	Course Name	Credit
1	I	DHU01C01	RESEARCH METHODOLOGY	3
2	I	PCH11C02	ADVANCED NUMERICAL METHODS IN CHEMICAL ENGG.	4
3	I	PCH11E01	MOLECULAR CELL BIOLOGY	4
4	I	PCH11P01	INSTRUMENT ANALYSIS LABORATORY	2
5	I	PCH11P02	COMPUTER AIDED NUMERICAL LABORATORY	2
6	I	PCH11P03	SEMINAR	1

h. Requirement of subject offered by HSS Deptt. to be completed: **RESEARCH METHODOLOGY**

i. (In the case of Full time Scholars Only) The Scholarship to paid per month, until further communication, at the rate of: **18000** Rs pm, w.e.f **15.07.2013** for one year.

j. The award of the scholarship is subject to all conditions prescribed by the rules and regulations.

k. This provisional enrolment is made in order to allow the candidate to start attending classes / doing research work. However, this is subject to approval of the Senate and can be cancelled or modified at any stage in the event of any discrepancy being found out.

Dy. Registrar (Acad.) / Asst. Registrar (Academic)



राष्ट्रीय प्रौद्योगिकी संस्थान अगर्तला
NATIONAL INSTITUTE OF TECHNOLOGY AGARTALA

CHANGE / ADDITION / DELETION OF A SUPERVISOR

Form NITA/ACAD/PHD/12

DEPARTMENT OF Chemical Engineering

Name of the student	Enrollment no.	Date of Enrollment
DIBYA JYOTI HALDAR	130DCH002	15.07.2013

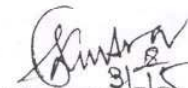
Sl. No.	Existing supervisor(s) and /or Joint supervisor	Department
1	DR. KALYAN GAYEN	Chemical Engineering
2	DR. DWAIPAYAN SEN	Chemical Engineering

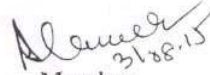
The following faculty has opted out to be the supervisor(s)/ Joint Supervisor of the student (attach consent of the supervisor opting out) Left NIT Agartala

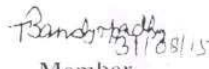
Sl. No.	Name	Designation	Role in the DC	Department/Organisation
1	DR. DWAIPAYAN SEN	Assit. Prof.	Supervisor	Chemical Engg.

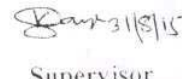
The following faculty is recommended to be included as Supervisor(s)/ Joint supervisor of the student (Attach consent of the student, the existing supervisor and the proposed one)


Sl. No.	Name	Designation	Role in the DC	Department	Reason for change
1	DR. DWAIPAYAN SEN	Assit Prof	External Supervisor	Chemical Engg., Heritage Institute of Technology	Left NIT Ag

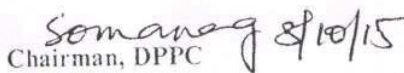

Chairman, DC 31/8/15


Member 31/08/15

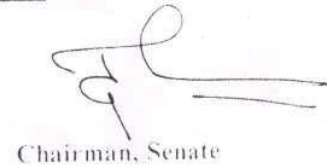

Member 31/08/15


Supervisor 31/8/15


Supervisor 31/8/15


Chairman, DPPC 31/10/15


Dean, Academic 31/10/2015


Chairman, Senate

যাদবপুর বিশ্ববিদ্যালয়



DR. B.KARMAKAR
PRINCIPAL SECRETARY
FACULTY OF ENGINEERING & TECHNOLOGY

*JADAVPUR UNIVERSITY
KOLKATA-700 032, INDIA

Ref. No. D-7/E/316/16

Date: April 22, 2016

To
Souptik Bhattacharya,
DC - 28 Narayan Tala Road (West),
P.O. - Deshbandhu Nagar,
Baguiati,
Kolkata - 700 059

Sub : Ph.D. (Engineering) Registration.

With reference to your application for registration to Ph.D. (Engineering) degree, you are hereby informed that you have been permitted to register your name on payment of requisite Ph.D. Programme fee of Rs.22000/- (Rupees twenty two thousand only) payable in three semi annual installments (8,000/- + 8,000/- + 6,000/-). You may be noted that the date of payment of registration fee will be considered as date of registration.

Registration shall remain valid for five years from the date of registration. The period of validity may be extended on sufficient grounds, if the Doctorate Committee satisfied. But such extension shall not exceed two years. Such application for extension duly forwarded by the supervisor/s shall have to be submitted before expiry of the validity of registration.

The approved title of your thesis is: "BIOLOGICAL PRODUCTION OF BIOPHARMACEUTICALS AND PURIFICATION USING ADVANCED SEPARATION TECHNOLOGY".

If the registration fee is not paid within a month from date of issue of this letter, your application may be treated as cancelled. Your research will be governed by this New Ph.D. Rules and Regulation Please visit our University website www.jadavpur.edu for New Ph.D. Rules and Regulations. For any further clarification you may contact the undersigned.

You are directed to complete 2 (Two) course work within a maximum period of two years from the date of registration as per Revised New Ph. D. rules & regulation.

(Dr. B. Karmakar)
Principal Secretary, FET

Copy : Secretary, FET (vide Res. No. B (23) of D.C meeting. Dt. 27.01.16

Records - 2

Supervisor/s - Prof. Chiranjib Bhattacharjee,
Chemical Engg. Department, J.U.

Dr. Dwaipayan Sen,
Department of Chemical Engineering,
Heritage Institute of Technology,
Kolkata - 700 107

Sm

যাদবপুর বিশ্ববিদ্যালয়



DR. B.KARMAKAR
PRINCIPAL SECRETARY
FACULTY OF ENGINEERING & TECHNOLOGY

*JADAVPUR UNIVERSITY
KOLKATA-700 032, INDIA

Ref. No. D-7/E/312/16

Date: April 22, 2016

27.

To
Ankita Mazumder,
Trayee Apartment (1st Floor),
Modern Park, 20 - B Central Road,
(Near Kadamtala Rickshaw Stand),
Santoshpur,
Kolkata - 700 075

Sub : Ph.D. (Engineering) Registration.

With reference to your application for registration to Ph.D. (Engineering) degree, you are hereby informed that you have been permitted to register your name on payment of requisite Ph.D. Programme fee of Rs. 14000/- (Rupees Fourteen thousand only) payable in three semi annual installments (5,000/- + 5,000/- + 4,000/-). You may be noted that the date of payment of registration fee will be considered as date of registration.

Registration shall remain valid for five years from the date of registration. The period of validity may be extended on sufficient grounds, if the Doctorate Committee satisfied. But such extension shall not exceed two years. Such application for extension duly forwarded by the supervisor/s shall have to be submitted before expiry of the validity of registration.

The approved title of your thesis is: "STUDIES ON ADVANCED OILY WASTEWATER TREATMENT PROCESS".

If the registration fee is not paid within a month from date of issue of this letter, your application may be treated as cancelled. Your research will be governed by this New Ph.D. Rules and Regulation Please visit our University website www.jadavpur.edu for New Ph.D. Rules and Regulations. For any further clarification you may contact the undersigned.

You are directed to complete 2 (Two) course work within a maximum period of two years from the date of registration as per Revised New Ph. D. rules & regulation.

You are informing to bring the following documents at the time of deposition of Ph.D. programme fee.

1. Original Migration Certificate.

(Dr. B. Karமாகar)
Principal Secretary, FET

Copy : Secretary, FET (vide Res. No. B (22) of D.C meeting. Dt. 27.01.16)
Records - 2
Supervisor/s - Prof. Chiranjib Bhattacharjee,
Chemical Engg. Department, J.U.

Dr. Dwaipayan Sen,
Department of Chemical Engineering,
Heritage Institute of Technology,
Kolkata - 700 107

Sm



सत्यमेव जयते

Telegram : Sciencetech
दूरभाष/Tel : 26962819, 26567373,
26562134, 26562122 (EPBAX)
फैक्स/Fax : 26569908, 26864570,
26863847, 26862418

SPEED-POST

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय,
विज्ञान और प्रौद्योगिकी विभाग,
टेक्नोलॉजी भवन, महरौली मार्ग,
नई दिल्ली-110016

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY,
DEPARTMENT OF SCIENCE AND TECHNOLOGY,
TECHNOLOGY BHAVAN, NEW MEHRAULI ROAD,
NEW DELHI-110 016

No.DST/TSG/AMT/2015/276

Dated: 08.09.2015

To,

Dr. Chiranjib Bhattacharjee

Professor

Department of Chemical Engineering,

Jadavpur University, Kolkata-32,

West Bengal

cbhattacharyya@chemical.jdvu.ac.in; c.bhatta@gmail.com,

dwaipayan.sen@heritageit.edu, dwaipayanju@gmail.com, projjwal_sarkar@yahoo.com

Subject: Project entitled "Development of Novel Electroflotation / Electrocoagulation Enhanced Membrane Module for Oily Waste Water Treatment" submitted to DST for financial support under Advanced Manufacturing Technologies - Technology Systems Development Programme (TSDP).

Dear Dr. Chiranjib Bhattacharjee,

I am directed to refer to your letter dated on 28.08.2015 forwarding therewith a project proposal on the above quoted subject and to acknowledge receipt.

Above said proposal will be scrutinized by the Initial Screening Committee in the month of October / November 2015 for referring the proposal for evaluation. Final decision on the proposal will be taken by the Expert Committee preferably in the month of January / February 2016, after peer reviewed.

Kindly quote our reference number in all your future correspondence.

With regards,

Yours sincerely

(Dr. Rajeev Sharma)

Scientist - D, TDT Division

Room No. 20, Hall-C

Telephone No. 2659 0310

Tele Fax-2660 2187

Mobile: 09971 888 229

E-mail: rajeevsharma@nic.in

Copy To:

1. **Dr. Projjwal Sarkar**, Assistant Professor, Department Of Chemical Engineering, Durgapur Institute Of Advanced Technology And Management ,Rajbandh, Durgapur, West Bengal.

2. **Dr. Dwaipayan Sen**, Assistant Professor, Department Of Chemical Engineering, Heritage Institute Of Technology, Kolkata-107, West Bengal

No. DST/TSG/AMT/2015/276(Capital)
Government of India
Ministry of Science & Technology
Department of Science & Technology

Technology Bhavan
New Mehrauli Road
New Delhi- 110 016
Dated: 11.07.2016

ORDER

Subject: **Financial assistance for the project entitled "Development of Novel Electro flotation/Electrocoagulation Enhanced Membrane Module for Oily Waste Water Treatment" submitted by Dr. Chiranjib Bhattacharjee, Professor, Department of Chemical Engineering, Jadavpur University, Kolkata - 700 032, West Bengal**

With reference to the Sanction Order No. DST/TSG/AMT/2015/276(General) Dated 11.07.2016, sanction of the President is accorded for the approval of ₹. **3,70,000/-** (Rupees Three Lakh and Seventy Thousand only) i.e. ₹. **3,00,000/-** (Rupees Three Lakh only) as the contribution of DST and ₹. **70,000/-** (Rupees Seventy Thousand only) as the contribution of Industry Collaborator M/s Concepts International, 730, Chakgaria, Kolkata- 700 094, West Bengal.

Sanction of the President is also accorded for the release of ₹. 3,00,000/- (Rupees Three Lakh only) towards the purchase of equipment's under the creation of Capital Assets in the above mentioned project as indicated below.

Non-recurring (Capital Items)				
	HEAD	1 st year DST	3 rd year Collaborator	TOTAL
1.	EQUIPMENTS : Corrosion cell kit, potentiostat and portable potentiostat.	₹. 3,00,000/-	0	₹. 3,00,000/-
	Electro-flotation Cell	0	₹. 70,000/-	₹. 70,000/-
	Total			₹. 3,70,000/-

2. The amount of ₹. **3,00,000/- (Rupees Three Lakh only)** will be transferred to the Registrar, Jadavpur University, Kolkata through bank account No. **11079699404**, State Bank of India, IFSC Code : **SBIN0000093**, Jadavpur University.

3. The amount involved is debit to:

Demand	Department of Science & Technology
No77	
3425	OTHER SCIENTIFIC RESEARCH (MAJOR HEAD)
60	OTHERS (SUB - MAJOR HEAD)
60.200	ASSISTANCE TO OTHER SCIENTIFIC BODIES (MINOR HEAD)
26.01	TECHNOLOGY DEVELOPMENT & TRANSFER
26.01.35	GRANTS FOR CREATION OF CAPITAL ASSETS (PLAN) 2016-2017 (TSG)

4. The sanction has been issued under the powers delegated to the Ministries and with the concurrence of the Integrated Finance Division of Department of Science & Technology vide concurrence No. C/1906/IFD/2016-17 dated 06.07.2016 and with the approval of Head (TDT) vide his diary No. P-3281 dated 29.06.2016.

5. It is also certified that this is the **first sanction** for the project and as such the clause related to the submission of the Utilization Certificate to PAO is not applicable.

6. The institute will furnish to the DST, utilization certificate and audited statement of accounts pertaining to the grant immediately after the end of each financial year. All purchases of equipments etc. would be as per GFR and the disposal of the same would be done with prior approval of DST.

P.T.O.

----- Forwarded message -----

From: **Mrinal Das** <mrinal@nist.edu>

Date: Tue, Sep 12, 2017 at 11:32 AM

Subject: Fwd: FW: Some update on Electronic research and NIST chip development

To: <krishanu.datta@heritageit.edu>

Cc: Mrinal Das <mrinal_d@sankalpsemi.com>

Krishanu da,

Long time didn't sync. How are you .. Are you still in Heritage ?

Recently as part of my research effort (outside Sankalp) , we won a large funded project - mentioned below. This also have the Venus chip funded as part of it. I was wondering if you still be interested for developing an ultra-low power memory for this chip . Please call me when you are free ..

Regards,

Mrinal

From: Mrinal Das [mailto:mrinal_d@sankalpsemi.com]

Sent: Friday, September 08, 2017 11:02 AM

To: 'karthik' <sankaran.karthik@gmail.com>; Vivek G Pawar <vivek_p@sankalpsemi.com>; 'Janakiraman S' <jani@nuvepro.com>; 'Venkatesh IESA' <venkatesh@iesaonline.org>; 'Vikram Labhe' <labhevik@gmail.com>; 'NK Mohapatra' <ceo@essc-india.org>

Cc: 'ajit panda' <akpanda@nist.edu>

Subject: Some update on Electronic research and NIST chip development

All ,

Thank you for being an well-wisher to me personally as well as NIST team. Thanx again for several positive comments shared during your last visit. Thought of sharing some positive development.

1) We have won a large project named “Real time Water and Air Quality monitoring” promoted by Intel , Department of Science and Technology,GOI and Indo-US Science and Technology Fund.

2) Our project named “Integrated low cost water sensor for real time river-water monitoring and decision making (SensorWarn)” got awarded a budget of Rs. 9 Crore for execution over 5 years. Overall approach is to develop a real time water monitoring smart buoy on the river Yamuna which includes several smart electronics and data monitoring.

3) Project is jointly led by NIST and IIT Delhi in collaboration with Stanford University and New Jersey Institute of Technology. It’s an Indo-US proposal , hence many of the developments will be in India and

some in US. Attached is the presentation which we presented in front of the jury from Intel , DST and US team.

4) It took more than 9 months to conceptualize , collaborate , create technical details of all aspects and then finally go through 4 levels of evaluation stages. There were 100s of proposals submitted, out of which only 5 got shortlisted for level 2. Other 4 Water quality projects were from IIT Bombay , IIT Hyderabad , IIT Mandi and IIT Kanpur . As you can see NIST was the only college from any private colleges being able to come to level 2 after technical evaluations. Then we had an interview in Delhi IUSSTF office where myself and Dr. Panda were grilled f2f. Finally we got the news today morning as the winner of the only project in Water quality that is being funded. This would not have happened without many blessings from people like you.

5) As you can see in the slides (pg11,12,13) one of the major proposal from NIST is to do the chip Venus, that I have been talking elsewhere, as part of this integrated system solution. Venus will have three versions (as a follow up to Mercury) , Venus 1 only the AMS portion, Venus 2 with microcontroller integration and Venus 3 with PM for energy harvesting integrated. Chip program itself now have a fund allocation around 1 Crore INR. Overall solution will be put on Yamuna river below the bridge that connects Delhi and Noida. On a lighter note, I hope Venus lands to Yamuna safely 😊

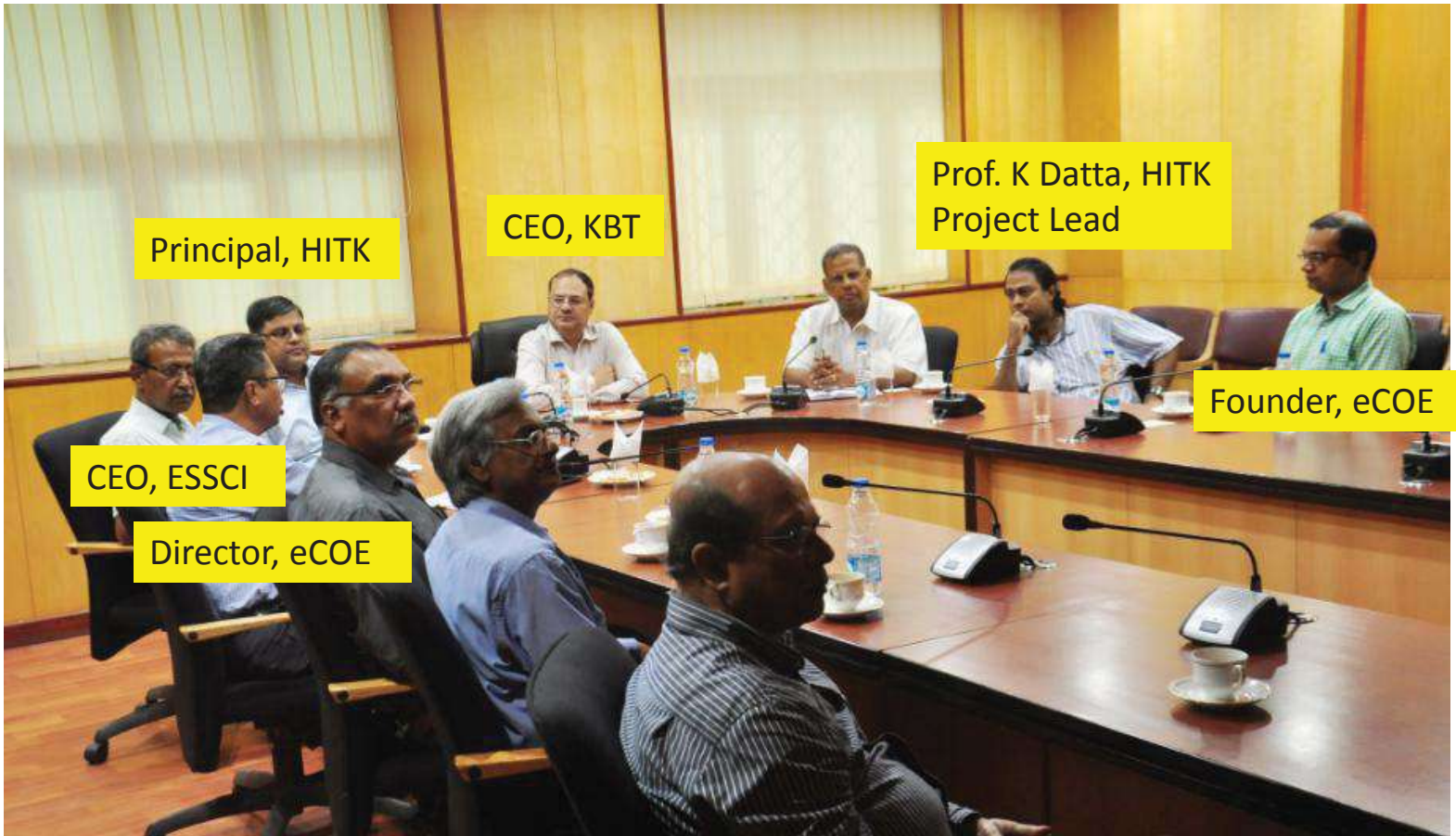
6) I am also thankful to Mohapatra ji and ESSCI for helping me setting up the Bench characterization lab. So by the time Venus gets developed Char lab will be up and running in the BBSR-DLF space that you saw last time.

7) Finally this Indo-US project will always be special to me , as this was my first attempt after moving from Industry to Academics to lead a “meaningful research” where we can develop and integrate VLSI chip for a cause that directly impacts India. So far I have done chips only for mobile and got bored 😊

I am in the middle of several such large funded project proposals, will like to work together with some of you (either as company collaboration or on personal associations) , so that we can reach the goal of converting research into productization at a faster pace.

Best Regards,
Mrinal

India Chip Program Management Meeting



Principal, HITK

CEO, KBT

Prof. K Datta, HITK
Project Lead

Founder, eCOE

CEO, ESSCI

Director, eCOE

India Chip Program Management Meeting



India Chip Program Management Meeting



India Chip Program Management Meeting



Industrial Training on VLSI Design

This certificate is awarded to **Anurima Mallick** of Heritage Institute of Technology, Kolkata, D/O Rupam Mallick for successfully completing the training course entitled RTL Design Engineer of 200 Hours duration through online conducted from **16th Sept 2021** to **16th October 2021**.



Dr. Ajit Kumar Panda

Center In-Charge

Industrial Training on VLSI Design

This certificate is awarded to **Arin Saha** of Heritage Institute of Technology, Kolkata, S/O Bablu Saha for successfully completing the training course entitled RTL Design Engineer of 200 Hours duration through online conducted from **16th Sept 2021** to **16th October 2021**.



Dr. Ajit Kumar Panda

Center In-Charge

Industrial Training on VLSI Design

This certificate is awarded to **Sayani Chatterjee** of Heritage Institute of Technology, Kolkata, D/O Swapan Chatterjee for successfully completing the training course entitled RTL Design Engineer of 200 Hours duration through online conducted from **16th Sept 2021** to **16th October 2021**.



Dr. Ajit Kumar Panda

Center In-Charge

Industrial Training on VLSI Design

This certificate is awarded to **Tanay Gautam** of Heritage Institute of Technology, Kolkata, S/O Mukesh Kumar for successfully completing the training course entitled RTL Design Engineer of 200 Hours duration through online conducted from **16th Sept 2021** to **16th October 2021**.



Dr. Ajit Kumar Panda

Center In-Charge

Industrial Training on VLSI Design

This certificate is awarded to **Rajatava Kar Choudhury** of Heritage Institute of Technology, Kolkata, S/O Amitava Kar Choudhury for successfully completing the training course entitled RTL Design Engineer of 200 Hours duration through online conducted from **16th Sept 2021** to **16th October 2021**.



Dr. Ajit Kumar Panda

Center In-Charge

NCL TECHNOLOGIES LTD.

Corporate Identity Number: L74140DL1991PLC046369

Technology Hub, Special Economic Zone

Plot No : 3A, Sector 126, NOIDA 201 304, UP, India.

T +91 120 6125000 F +91 120 4683030

Registered Office: 806 Siddharth, 96, Nehru Place, New Delhi-110019, India.

www.hcltech.com

www.hcl.com

7th July 2021

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Shuvam Podder**, a student of **Heritage Institute of Technology, Kolkata**, had undergone an internship in our Organization with our **ISD Team** from **07-Dec-20** to **07-Jun-21** and submitted his project report to us on **LVC MOS18 IO Design** and the same has been found satisfactory.

His conduct and performance were good during the internship period.

Regards,



Ashish Bhalla
Associate Director – Human Resource
HCL Technologies Ltd

Confidential

HCL TECHNOLOGIES LTD.

Corporate Identity Number: L74140DL1991PLC046369

Technology Hub, Special Economic Zone

Plot No : 3A, Sector 126, NOIDA 201 304, UP, India.

T +91 120 6125000 F +91 120 4683030

Registered Office: 806 Siddharth, 96, Nehru Place, New Delhi-110019, India.

www.hcltech.com

www.hcl.com

7th July 2021

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Sagar Kumar Lo**, a student of **Heritage Institute of Technology, Kolkata**, had undergone an internship in our Organization with our DCT Team from **07-Dec-20** to **07-Jun-21** and submitted his project report to us on **Design and Implementation of Analog Front End** and the same has been found satisfactory.

His conduct and performance were good during the internship period.

Regards,



Ashish Bhalla
Associate Director – Human Resource
HCL Technologies Ltd

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HCL TECHNOLOGIES LTD.
Corporate Identity Number: L24140241897PLC098394
Technology Park, Global Economic Zone
Plot No - 2A, Sector 12B, NOIDA 201 204, UP, India.
T +91 120 8125000 F +91 120 4080000
Registered Office: 6th, Sector 96, Noida Phase, New Delhi-110019, India.
www.hcl.com

7th July 2021

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. Sandipan Dey, a student of Heritage Institute of Technology, Kolkata, had undergone an internship in our Organization with our PMT Team from 07-Dec-20 to 07-Jun-21 and submitted his project report to us on Standalone Multiloop fast LDO (Linear Regulator) and the same has been found satisfactory.

His conduct and performance were good during the internship period.

Regards,



Ashish Bhalla
Associate Director – Human Resource
HCL Technologies Ltd.

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HCL TECHNOLOGIES LTD

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Technology Hub, Special Economic Zone

Plot No: 3A, Sector 12B, NOIDA 201 304, UP, India.

T: +91 120 6125100 F: +91 120 4582000

Registered Office: 808 Siddhant, 96, Nehru Place, New Delhi-110019, India.

www.hcltech.com

www.hcl.com

29th June 2021

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Abhishek Roy**, a student of Heritage Institute of Technology had undergone an internship in our Organization with our ERS Team from 7th December 2020 to 29th June 2021 and submitted his project report to us on LVCMOS18 IO Receiver Design and the same has been found satisfactory.

His conduct and performance were good during the internship period.

Regards,



Ashish Bhalla
Associate Director – Human Resource
HCL Technologies Ltd

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Ref: 12/e-COE/2020

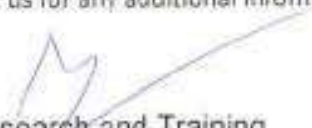
dated 11th July 2020

This letter certifies that Madhurima Mukherjee was an Intern with e-COE from 2nd January 2020 to 11th July 2020.

During her time with the e-COE, she has remained dedicated and loyal to her work and responsibilities with our company. Her responsibilities was to design an analog interface circuits for Sensors to use for water quality measurement. Madhurima did very good work and had always maintained a professional and courteous attitude and appearance while with our company.

Based on her request, we hereby released her from the organization as an Intern with effect from afternoon of 11th July 2020.

Please contact us for any additional information.


Director, Research and Training
For e-COE



ESSCI (Skill India) Result for Dec 2019 Jan 2020 Batch HITK Students based on Internship Industry Training at eCOE

From: **Mukesh Kumar Sukla** <mukesh.ecoe@gmail.com>

Date: Tue, Feb 18, 2020 at 10:38 AM

Subject: ESSCI ASSESSMENT Result: December - January Batch

To: <Abinashbharati1998@gmail.com>, <subhadeepmandal9999@gmail.com>, <singha4265@gmail.com>, <g.maulik99@gmail.com>, <sagarkumarlo647@gmail.com>, <arpanrikidas@gmail.com>, <swapnanildas1999@gmail.com>, <anirban.paul18@gmail.com>, <shuvamdonno@gmail.com>, <846anil@gmail.com>, Dhritikana Das <dhriti.195.dd@gmail.com>, <ankitababi3@gmail.com>, <majumderdebmalaya88@gmail.com>, Tirtharaj Bhadra <tirtharajsbhadra@gmail.com>, <shubhamkumar1497@gmail.com>, <dillip55@live.com>

Cc: Ajit Kumar Panda <akpanda62@hotmail.com>, Santosh Patnaik <skpatnaik@nist.edu>, Mrinal Das <mrinal.ecoe@gmail.com>, krishanu datta <krishanu.datta@heritageit.edu>, Mukesh Sukla <mksvlsi@gmail.com>

Dear All,

I am here to inform you all that ESSCI has declared the result for the assessment during January 2020.

It is really good to say that the **result is 100%**. I congratulate all for the success. Very soon we will share the printed certificates (Once generated by ESSCI).

Attached herewith the result sheet and your scores as shared by the assessor.

--

Mukesh Kumar Sukla

Program Manager & Trainer - Digital VLSI

Electronics Center of Excellence (e-COE)

DCB-622, DLF Cybercity, Patia

Bhubaneswar - 751024

Odisha, INDIA

Mobile: +91 - 9861762523

web: www.ecoe.co.in

ESSCI Assessment Results



TP Name ECoE
 Job Role VLSI Design Engineer
 Batch # ESSCI/OD/CSR/2019/183
 Assessment Date 14th Jan 2020
 Center DLF, Bhubaneswar
 Scheme CSR

Sl. No.	Trainee Name	NOS 1		NOS 2		Total Theory	Total Practical	Gross Total	Results
		Theory	Practical	Theory	Practical				
1	ARPAN DAS	34	42	34	41	68	83	151	Pass
2	MADHURIMA MUKHERJEE	25	39	28	45	53	84	137	Pass
3	SHUBHAM KUMAR	28	46	25	49	53	95	148	Pass
4	ABINASH BHARATI	25	50	29	37	54	87	141	Pass
5	ANKIT SINGH	32	47	28	38	60	85	145	Pass
6	DHRITIKANA DAS	29	42	27	36	56	78	134	Pass
7	SUBHADEEP MANDAL	31	44	32	46	63	90	153	Pass
8	SWAPNANIL DAS	27	45	25	39	52	84	136	Pass
9	D KUSHAL	28	45	34	36	62	81	143	Pass
10	KESHAV AGARWAL	28	39	28	46	56	85	141	Pass
11	GRANTHANA MAULIK	28	35	26	35	54	70	124	Pass
12	ANIL KUMAR	33	35	33	45	66	80	146	Pass
13	SHUVAM PODDER	25	45	29	43	54	88	142	Pass
14	ANIRBAN PAUL	25	42	26	49	51	91	142	Pass
15	SAGAR KUMAR LO	28	44	27	35	55	79	134	Pass
16	DILLIP SAHOO	34	36	29	45	63	81	144	Pass
17	ANKITA DAS	34	46	29	35	63	81	144	Pass

List of Students who qualified for Summer 2019 Industry Internship Training by eCOE
Exam Taken in HITK ECE DEPT.

From: **Mukesh Kumar Sukla** <mukesh.ecoe@gmail.com>
Date: Wed, Apr 10, 2019 at 5:26 PM
Subject: Result for EET-2019: LEVEL-1
To: krishanu datta <krishanu.datta@heritageit.edu>
Cc: Mrinal Das <mrinal.ecoe@gmail.com>, Ajit Kumar Panda <ajit.ecoe@gmail.com>, <santosh.ecoe@gmail.com>

Dear sir,

Herewith I have attached the list of the students who have qualified for the course. Students can start registering for the course by paying 20% of the course fees in advance.

Anyone who will register before 15th April will get a discount of 10%. As it is open for other colleges and universities also, we will follow the first-come first-serve basis.

Registration can be done by paying the amount to A/C (through NEFT/ RTGS/UPI).
a/c Name: ELECTRONICS CENTER OF EXCELLENCE
A/C Number: 0172-111-0000-4517
ifsc code: ANDB0000172

Kindly send me the Txn slip and detail and the true copy must be produced during reporting.

For any queries, feel free to contact me.

--

Mukesh Kumar Sukla
Program Manager & Trainer - Digital VLSI

Electronics Center of Excellence (e-COE)
DCB-622, DLF Cybercity, Patia
Bhubaneswar - 751024
Odisha, INDIA
Mobile: +91 - 9861762523
web: www.ecoe.co.in



Date of Examination:
Name of the Coordinator:
E-Mail ID:
Contact Number:

04.04.2019
Prof. Krishanu Datta
krishanu.datta@heritagoil.edu
9830039964

Sl. No.	Name of the Student	Institute Name	Contact No.	E-Mail	Score				Remark
					Sec-A	Sec-B	Sec-C	Total	
					40	40	20	100	
1	KSHITIJ SINHA	HITK	7903523381	kshitijcinha099@gmail.com	20	12	12	44	Selected
2	RAJARSHI BOSE	HITK	9433992214	brajanshibose1997@gmail.com	16	17	6	39	Selected
3	WRIBHU BOSE	HITK	9874951462	wribhubose@gmail.com	40	20	14	74	Selected
4	DEBSNIGDHA SINHA ROY	HITK	8913606062	sinharoypapai@gmail.com	20	12	16	48	Selected
5	KESHAV AGARWAL	HITK	9836619808	keshavelc@gmail.com	10	20	10	40	Selected
6	AVISHEK RAY	HITK	9007097240	aviray52@gmail.com	30	8	16	54	Selected
7	SOUMITRA CHAKRANORTY	HITK	7003303346	soumitra58@hotmail.com	30	14	10	54	Selected
8	ARUNABHA GHOSH	HITK	9875498280	ghosh.arunabha58@gmail.com	40	18	6	64	Selected
9	PRAGYA SINGH	HITK	9830633144	spragya007@gmail.com	20	13	6	39	Selected

ACKNOWLEDGEMENT

This is to Acknowledge that

Prof. Abhyuday Mallick has successfully completed the training program at **MACLEODS CENTRE OF EXCELLENCE, SARIGAM** from 31/08/2019 to 28/09/2019.

In this duration, He has acquired training on Good Manufacturing Practices and Equipments used in Unit Operations & Unit Process for Manufacturing of Active Pharmaceutical Ingredient in Pharmaceutical Industry. He has shown sincerity in his learning. We wish him all the very best for his career endeavor.



Head of the COE

Amit Kanabhai

28/09/2019

Issue Date



Head - HR

(Vinod Mathew (Retd))

Presentation to C-DAC of ongoing Vision research work at HIT, ECE department

Inbox



anindya sen <anindya.sen@heritageit.edu>

May 16,
2019, 12:17
PM

to Nabarun, Subhankar

To,
Dr. Nabarun Bhattacharya,
Senior Director & Centre Head,
Centre for Development of Advanced Computing (C-DAC)
Ministry of Communication & Information Technology
Government of INDIA,
E-2/1, Block- GP, Sector – V,
Salt Lake, Kolkata – 700091,
West Bengal, INDIA.

16-5-2019

Subject: Presentation on ongoing Vision research work at HIT, ECE department

Dear Sir,

As per our discussion on Monday 13-5-2019, I am glad to share information about the ongoing vision research work at Heritage Institute of Technology, ECE department. The present work is realized by two final year group of students as a part of their final year projects under my supervision. Brief details are provided below for your kind review.

Group1: A 2018 project group of students did excellent research work on Glaucoma producing a Conference and a Journal paper. The group requests a convenient date between 20th, to 30th May, to present their work in a thirty minute presentation. A morning session would be preferable as they may have to take leave to come and present from their individual local work places.

Project Title:

Automatic Evaluation and Predictive Analysis of Optic Nerve Head for the Detection of Glaucoma

Members:

Kaushik Dutta, Rishav Mukherjee, Shamik Kundu, Tanmay Biswas and Anindya Sen
Department of Electronics and Communication Engineering.
Heritage Institute of Technology, Kolkata

Publications: Conference and a journal paper

[1]. Kaushik Dutta, Rishav Mukherjee, Shamik Kundu, Tanmay Biswas, Anindya Sen
“Automatic Evaluation and Predictive Analysis of Optic Nerve Head for the Detection of Glaucoma,” 2018 2nd International Conference on Electronics, Materials Engineering & Nano-Technology (IEMENTech), May 4-5, 2018.

[2]. Rishav Mukherjee, Shamik Kundu, Kaushik Dutta, Somnath Majumdar, Anindya Sen,
“Predictive Diagnosis of Glaucoma based on Analysis of Focal Notching along the Neuro-retinal rim using Machine Learning,” Pattern Recognition and Image Analysis in Mathematical Theory and Applications (Accepted for publication in August 2019)

Group 2: Our current 2019 batch of students has done excellent work on diabetic retinopathy. The group requests a convenient date between 29th, to 31st May, to present their work in a thirty minute presentation, after their ongoing final examinations.

Project Title:

"Automatic detection of features in retinal fundus images for non proliferative diabetic retinopathy"

Team Members : Ankit Bhattacharya Arnab Acharyya Sayantan Mukherjee Subhojit Roy Bardhan

Project Guide: Anindya Sen

If allowed to present these two works, we shall look forward to your kind review, observation, and would treasure any valuable comments that would fruitfully guide our research to be more effective socially and be beneficial to the common people in the best interest of our country.

Best Regards

Anindya Sen, Ph.D.

Professor, ECE Department

Heritage Institute of Technology

M: 9831463470



Subhankar Mukherjee <subhankar.mukherjee@cdac.in>

May 17,
2019, 12:48
PM

to Souvik, Alokesh, me, Nabarun

Dear Sir,

Thank you very much for your email and showing your interest to share your innovation with us towards production worthy prototype development, deployment and commercialization.

We are keen to know about your innovations on mentioned areas. 27th May (Monday) at 11:45 h. will be preferable for us.

Looking forward to your kind confirmation.

With thanks and regards,
Subhankar

Disclaimer:

This e-mail contains confidential information belonging to Heritage Institute of Technology & is intended solely for the Addressee. The unauthorized disclosure, use dissemination or copying (either whole or partial of this e-mail, or any information it contains), is prohibited. E-mail is susceptible to alteration and their integrity cannot be guaranteed. Heritage Institute of Technology shall not be liable for this e-mail if modified or falsified. If you are not the intended recipient of this e-mail, please delete it immediately from your system & notify the sender of the wrong delivery and the mail deletion.

Thank you,

With highest regards,
Subhankar.

SUBHANKAR MUKHERJEE
PROJECT ENGINEER
Agri and Environmental Electronics Group
Centre for Development of Advanced Computing (C-DAC)
Ministry Of Electronics & Information Technology (MeitY)
Government of India
E-2/1, Block - GP, Sector - V
Salt Lake, Kolkata - 700091
West Bengal, India

Contact:

Ph: +91-33-2357-5989 (Ext:298)

Mob- +91 - 94773-55692

Fax : + 91 - 33 - 2357 5141

E-Mail: subhankar.mukherjee@cdac.in; subhankarm8585@gmail.com

Website: **MailScanner has detected a possible fraud attempt from "www.cdackolkata.in" claiming to be www.cdac.in**

Students who participated in 2018 Summer Internship Industrial Training by eCOE

From: **Nihar Sahu** <nihar.ecoe@gmail.com>
Date: Fri, Jan 4, 2019 at 5:13 PM
Subject: Students List
To: krishanu datta <krishanu.datta@heritageit.edu>

Sir,
pfa the students list who have done the L1 raining at eCOE.

Thanks & Regards

Nihar

Nihar Ranjan Sahu
Center Coordinator,
eCOE, DCB-622, DLF Cyber City,
Patia, Bhubaneswar-24
Odisha
Mob: +91-9937868260

1	Student Name	College	Branch	Year	Contact No	Email Id
2	Milan Pramanik	HIT, Kolkata	ECE	4th	9432168522	milanpramanik8@gmail.com
3	Prajjol Kumar Mitra	HIT, Kolkata	ECE	4th	8910324727	prajjolmitra@gmail.com
4	Akash Roy	HIT, Kolkata	ECE	4th	8582960476	meakashroy.ar@gmail.com
5	Shubhang Pandey	HIT, Kolkata	ECE	4th	9748500729	shubhangpandey@outlook.com
6	Bapi Saradar	HIT, Kolkata	ECE	4th	8972478192	bapisardar32@gmail.com
7	Nikita Paul	HIT, Kolkata	ECE	M.TECH	9002430139	i.paulnikita@gmail.com
8	Gouri Shankar Roy	HIT, Kolkata	ECE	M.TECH.	9835938253	shankarroy766@gmail.com
9	Rupayan Das	HIT, Kolkata	ECE	M.TECH.	9038178596	rupayandas7@gmail.com
10	Barnali Saha	HIT, Kolkata	ECE	4th	7278682914	sbarnali818@gmail.com
11	Moumita Majumder	HIT, Kolkata	ECE	4th	9804914594	moumita.ece06@gmail.com
12	Gaurav Nandan	HIT, Kolkata	ECE	4th	9097842855	gauravnandan881@gmail.com
13	Abhinav Anand	HIT, Kolkata	ECE	4th	9431682045	abhinav97june@gmail.com
14	Vishal Kumar	HIT, Kolkata	ECE	4th	9831661452	iamvishalk26@gmail.com
15	Paban Santra	HIT, Kolkata	ECE	4th	9333471244	pabansantra85@gmail.com
16	Anuj Kumar	HIT, Kolkata	ECE	4th	8582899943	anujk018@gmail.com
17	Chandan Kumar	HIT, Kolkata	ECE	4th	8017571231	cpsparsh143@gmail.com

Students who participated in 2018 Winter Internship Industrial Training by eCOE

From: **Nihar Sahu** <nihar.ecoe@gmail.com>
Date: Mon, Feb 11, 2019 at 3:00 PM
Subject: Re: Cheque for L1 registration amount
To: krishanu datta <krishanu.datta@heritageit.edu>, Mukesh Kumar Sukla
<mukesh.ecoe@gmail.com>
Cc: Mrinal Das <mrinal.ecoe@gmail.com>

Dear Prof. Datta,

Greetings from eCOE.
The cheque should be in favor of "ELECTRONICS CENTER OF EXCELLENCE".

Also as required please find attached the list of the students.

Thanks & Regards

Nihar Ranjan Sahu
Center Coordinator,
eCOE, DCB-622, DLF Cyber City,
Patia, Bhubaneswar-24
Odisha
Mob: +91-9937868260

1	ECOE Sl.No	NAMES	CONTACT NO	EMAIL ID	M/F
2	1	ANIK SEN GUPTA	6290694373	senguptaanik8@gmail.com	M
3	2	RISHAV SEN	9874778489	rishavs0000@gmail.com	M
4	3	MEGHNA MISRA	8013230425	meghnamisra8@gmail.com	F
5	4	ANKUR KUMAR	8481928414	ankurgyanti26@gmail.com	M
6	5	SUBHA ROY	9614416082	subharoymessi@gmail.com	M
7	6	KRISHNA KR.SAMANTA	8967341577	krishnasamanta346@gmail.com	M
8	7	SATISH KUMAR	9835825087	satishkr314@gmail.com	M
9	8	SHIVAM ACHARYA	8820788225	shivacharya125@gmail.com	M
10	9	ANINDITA MONDAL	8582844307	aninditamondal1037@gmail.com	F
11	10	ARVIND KUMAR	8271043313	arvind.kumar8271043313@gmail.com	M
12	11	ABHISHEK RANJAN	9163355153	arajan1245@gmail.com	M
13	12	RAHUL KUMAR	8757200296	rahuliit30@gmail.com	M
14	13	MADHURIMA MUKHERJEE	9883666672	madhurimamukherjee2@gmail.com	F
15	14	GAURAV KUMAR	7903389198	thakurgaurav7903@gmail.com	M
16	15	MRINMOYI MANNA	8420060848	i.mrinmoyimanna@gmail.com	F
17	16	ISHITA CHAKRABORTY	7044525388	chakraborty19011996@gmail.com	F

eCOE Enabled online Internship Industry Training in Summer 2020 due to Pandemic Situation. Prof. Krishanu Datta worked with eCOE Management to enable this Online Training.

From: **Mrinal Das** <mrinal.ecoe@gmail.com>
Date: Mon, May 11, 2020 at 1:41 PM
Subject: eCOE Virtual Training for VLSI Engineers
To: krishanu datta <krishanu.datta@heritageit.edu>
Cc: sonu vishwakarma <sonu.ecoe@gmail.com>, Abhishek Roy <98.abhishek.roy@gmail.com>, Reebhu Goswami <reebhu428@gmail.com>, Uditanshu Bhattacharya <uditan98@gmail.com>, BHASKAR DEBNATH <bhaskar9679142942@gmail.com>, BIDISHA PAL <bidishapaleko@gmail.com>, Soham Bhattacharya <sohambhattacharya98@gmail.com>, Sandipan Dey <deysandy.1999@gmail.com>, Ritaban Datta <ritabandatta@gmail.com>, sankalpa mukherjee <sankalpa300499@gmail.com>, Souhadri Das <souhadridas99@gmail.com>, The JeLi <mirnurezzaman@gmail.com>, Pradepto Addya <pradepto.addya1008@gmail.com>, Ajit Kumar Panda <akpanda62@hotmail.com>, keshavelc <keshavelc@gmail.com>, anuran bose <anuran.bose3001@gmail.com>, Debadrita Das <debadrita.jj@gmail.com>

Team,

We'll be starting the batch from 15th May . Tentatively course will be over by 4th June. Sonu sir will send more details about timings and logistics. Meanwhile please warm yourself up by going through some of your basics classes done in college 2nd year and 3rd year. This will help.

You need to pay the amount for the fees in the week of 25th May. You'll need to do online payment , details of which will be shared later.

Look forward to interact with all of you.

Best Regards,
Mrinal

On Sat, May 9, 2020 at 12:10 PM krishanu datta <krishanu.datta@heritageit.edu> wrote:

Thanks Mir for updating your status, for remaining issue on Magic, work with Sonu Sir

Debadrita, you can update your status in spreadsheet. I think you have some Magic related issue, please work with Sonu Sir

Aunran, Waiting for your status

Thanks
KD Sir

On Sat, May 9, 2020 at 11:34 AM krishanu datta <krishanu.datta@heritageit.edu> wrote:

Dear All,

Thanks for updating your tool Installation Status.
Waiting for Anuran and Mir. Please tell your status and update below spreadsheet. Take help from Sonu Sir. We have to wrap up this process asap.

Thanks
KD Sir

1	Please type Yes if you have installed the software else tell what issue you are facing so that we can help you				
2	NAME	Tera	LTspice	Iverlog	Magic
3	Uditanshu Bhattacharya	Yes	Yes	Yes	Yes
4	BHASKAR DEBNATH	Yes	Yes	Yes	Yes
5	BIDISHA PAL	Yes	Yes	Yes	Yes
6	Reebhu Goswami	Yes	Yes	Yes	Yes
7	Pradepto Addya	Yes	Yes	Yes	Yes
8	Soham Bhattacharya	Yes	Yes	Yes	NO
9	Sandipan Dey	Yes	Yes	Yes	Yes
10	Ritaban Datta	Yes	Yes	Yes	Yes
11	Souhadri Das	Yes	Yes	Yes	Yes
12	Sankalpa Mukherjee	Yes	Yes	Yes	Yes
13	Mir Nurezzaman	Yes	Yes	Yes	Yes
14	Abhishek Roy	Yes	Yes	Yes	Yes
15	Debadrita Das	Yes	Yes	Yes	Yes

Sankalp Semiconductor and e-COE (Electronic Center of Excellence) One Month Boot Camp in HITK ECE VLSI LAB

Various email on planning, schedule, execution and feedback.

From: **Mrinal Das** <mrinalsankalp@gmail.com>
Date: Sat, Jan 19, 2019 at 4:55 PM
Subject: **Re: Sankalp Semiconductor - final interview for boot camp participants - Tue 22 Jan (at Sankalp Kolkata campus)**
To: kaushik bhattacharya <kaushik.bhattacharya@heritageit.edu>
Cc: krishanu datta <krishanu.datta@heritageit.edu>

I had a chat with Chaitali. She'll send you the details like schedule/address etc. on Monday.

Tentatively session will start around 9:30 am with 2 folks per hour. There are 2 business units within Sankalp which will do parallel Interview to ensure maximum selection.

Regards,
Mrinal

On Fri 18 Jan, 2019, 3:21 PM kaushik bhattacharya
<kaushik.bhattacharya@heritageit.edu> wrote:
Dear Mr. Das,

Thank you for your mail - and greetings for the new year!

Yes, it will be absolutely fine to ask these 14 students to attend final interviews at the Sankalp campus in New Town.

All we need to know are things like full address of the office, identification / documentation to be carried by candidates, brief overview of the interview structure (GD / technical / HR interview? how many rounds? elimination at each step?), approximate time to budget for the entire interview process? If you can connect me with the HR coordinator, then we can take this up further.

I would also request that your selection team conduct a pre-placement talk with the attending students at the beginning, where they can better understand the role and career path and also clarify any doubt. Since such a talk could not be arranged when you came for the online test, it is important we don't miss the step.

Prof. Datta,

Please add if any other clarification is needed for the students?

Thanks & Regards

Kaushik Bhattacharya
Head - Training & Placement
The Heritage Group of Institutes
994 Madurdaha, Chowbaga Road, Anandapur
Kolkata 700 107
Phone +91-33-2443-1565 / 6627-0643
Mobile +91-98300-07333

On Fri, 18 Jan 2019 at 14:50, Mrinal Das <mrinalsankalp@gmail.com> wrote:
Mr. Bhattacharya,

'Hope you are doing well. As you know we are coming to an end of Sankalp Boot camp for the 14 shortlisted students(including batch1 and batch2).

Sankalp have requested if they can conduct final selection interviews for all of them on 22nd January in Sankalp Kolkata campus (Rajarhat). This will tentatively start at morning 9:30 am.

Once you confirm, I'll loop a separate mail connecting you and Sankalp HR coordinator, so that it can be smoothly executed ahead.

On behalf of Electronics Center of Excellence I am looking forward to a good performance for all of them.

Regards,
Mrinal

From: **krishanu datta** <krishanu.datta@heritageit.edu>
Date: Sat, Jan 19, 2019 at 11:13 AM
Subject: **Re: Sankalp shortlisted students**
To: Mrinal Das <mrinal.ecoe@gmail.com>
Cc: krishanu datta <krishanu.datta@heritageit.edu>

Dear Mrinal,

I am attaching my feedback.

Thanks

On Fri, Jan 18, 2019 at 12:19 PM Mrinal Das <mrinal.ecoe@gmail.com> wrote:
Krishanuda,

Attached is the list of 14 shortlisted. Please look at the sheet named Heritage and help filling up the last column for your inputs and recommendations based on the boot camp.

Regards,
Mrinal

--

Mrinal Das
Founder
Electronic Center of Excellence
+91-7381974602

--

Prof Krishanu Datta
Associate Professor
B.E.(J.U.), M.Tech (IIT KGP, Gold Medalist),
Ex Engineer in Intel Corporation in Pentium4 and i-core Design, Hillsboro, OR, USA
Lead and Coordinator: Microelectronics and VLSI design
Department of ECE, HITK

Sl No.	Name	College	Branch	Marks (%)		CGPA till date B.Tech	Sankalp Total(100) (Aptitude+Technical+Geometric)	Comments from eCOE	Observations from eCOE Boot Camp (KD)
				10th	12th				
1	Chandan Kumar	HIT, Kolkata	ECE	92.2	87	8.7	58	Selected from first round interview. Comes good in terms of basics.	Good basics. Always ask questions. Recommendation for Circuit and Layout. Excellent scripting capability.
2	Akash Roy	HIT, Kolkata	ECE	88	87	9.48	65	Selected from first round interview. Comes good in terms of basics. Class topper. Very good attitude. Strong recommendation.	Recommendation for both Circuit and Layout. Smart and Hardworking.
3	Pragati Kumar Mitra	HIT, Kolkata	ECE	84	82.5	8.1	54	Selected from first round interview. Comes good in terms of basics. Very good attitude. Strong recommendation.	Recommendation for both Circuit and Layout. Has leadership quality.
4	Shubhang Pandey	HIT, Kolkata	ECE	84.2	81.8	8.3	63	Selected from first round interview. Comes good in terms of basics. Strong recommendation.	Recommendation for both Circuit and Layout. Excellent Team member.
5	Anuj Kumar	HIT, Kolkata	ECE	85	83	7.2	44	Selected from first round interview. Comes good in terms of basics. Strong recommendation.	Good basics. Recommendation for both Circuit and Layout.
6	Subhajit Mondal	HIT, Kolkata					74	Very good in geometric aptitude. Will be an asset for layout team.	Recommendation both Circuit and Layout. One of Class Toppers. Ready to work on any challenging assignments.

7	KUNAL BAKSI	HIT, Kolkata					88		Could not complete Bootcamp due to personal reason. His score was really impressive in Sankalp Test. Wants to appear in final interview.
8	Sivani Kundu	HIT, Kolkata					65		Excellent dedication. Ready to learn. Strong recommendation for layout.
9	Manisha Kumari	HIT, Kolkata					80		Excellent learner and hard working. Strong recommendation for layout.
10	SAWAN KUMAR	HIT, Kolkata					58		Good Motivation. Right attitude. Recommendation for layout.
11	Sohom Ghatak	HIT, Kolkata					56		Excellent dedication. Ready to learn. Strong recommendation for layout.
12	Keshav kumar	HIT, Kolkata					55		Good Motivation. Right attitude. Recommendation for layout.
13	D KUSHAL	HIT, Kolkata					55		Excellent learner and hard working. Strong recommendation for layout.
14	Abhinav Anand	HIT, Kolkata					55		Excellent learner and hard working. Strong recommendation for layout.

From: **Mrinal Das** <mrinal.ecoe@gmail.com>

Date: Sat, Dec 1, 2018 at 11:53 AM

Subject: **Boot camp schedule modified**

To: <krishanu.datta@heritageit.edu>

Session Number	Topic	Hours	Topics to cover	Assignment	Owner
1	R-L-C and its application to AMS	2	Basic R-C circuits. Time domain , Frequency domain	R-C application questions	Mrinal
2	CMOS Fabrication Technology	2	Show the steps of the CMOS fabrication. Individual should be able to map layout mask to fabrication steps	2D , 3D picture of MOSFET and inverter	KD
3	Stick Diagram and design using stick diagrams	2	Show layout of digital logics using stick diagram	Several different blocks	Santosh
4	Introduction to Cadence for Analog Layout	4	Basic familiarity of Cadence. Schematic simulation is skipped.	Given an inverter schematic draw basic layout	KD
5	Layout techniques for basic gates	4	Half DRC , Tiling , Concept of floorplan, placement , constraints	Layout of NAND , NOR , combinational logics	GG
6	Advance Layout concepts	3	Real issues for analog layout	Latch-up , Electromigration , IR , matching , shielding	GG

Mrinal Das

Founder

Electronic Center of Excellence

+91-7381974602

From: **Mrinal Das** <mrinal.ecoe@gmail.com>
Date: Wed, Nov 28, 2018 at 4:54 PM
Subject: **Re: Boot Camp details**
To: <krishanu.datta@heritageit.edu>

Sounds good , that is exactly what is needed.

Regards,
Mrinal

On Wed, Nov 28, 2018 at 4:47 PM krishanu datta <krishanu.datta@heritageit.edu> wrote:

Dear Mrinal,

Yes, i can cover 2,3. And for your and my sessions, it does not need to be on Saturday, those can be done during week days. Regarding, Gourab's sessions since that has to be on Saturday only, we have to plan with him properly. I want Saturday session to be minimum as Lab Assistant has to be present on Saturday as per rule.. Lets make Gaurav's session only on Saturday, other sessions weekday.

Regarding Cadence familiarity, i want to cover schematic, i shall skip simulation.

Thanks
Krishanu

On Wed, Nov 28, 2018 at 4:25 PM Mrinal Das <mrinal.ecoe@gmail.com> wrote:
Krishanu da,

Below is the break-up for the boot camp for Basic VLSI and Analog layout . Please review and let me know if any questions.

First one I am supposed to take. Will you be able to do item 2 and 3 yourself ?
If skype can be enabled that will help as well.

Last 2 should be taken by Gourab , he'll probably break this into 3 sessions (working on to get his inputs) .

Regards,
Mrinal

Session Number	Topic	Hours	Topics to cover	Assignment
1	R-L-C and its application to AMS	2	Basic R-C circuits. Time domain , Frequency domain	R-C application questions
2	CMOS Fabrication Technology	2	Show the steps of the CMOS fabrication. Individual should be able to map layout mask to fabrication steps	2D , 3D picture of MOSFET and inverter
3	Introduction to Cadence for Analog Layout	4	Basic familiarity of Cadence. Schematic simulation is skipped.	Given an inverter schematic draw basic layout
4	Layout techniques for basic gates	4	Half DRC , Tiling , Concept of floorplan, placement , constraints	Layout of NAND , NOR , combinational logics
5	Advance Layout concepts	3	Real issues for analog layout	Latch-up , Electromigration , IR , matching , sheilding

A student's Mindset

--

Mrinal Das
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From: **Mrinal Das** <mrinalsankalp@gmail.com>
Date: Wed, Nov 28, 2018 at 10:42 AM
Subject: **Shortlist for Boot Camp and Interview for Sankalp Semiconductor**
To: kaushik bhattacharya <kaushik.bhattacharya@heritageit.edu>
Cc: krishanu datta <krishanu.datta@heritageit.edu>

Mr. Bhattacharya,

As a follow up to the written test conducted last week by eCOE & Sankalp in Heritage college , its a pleasure to announce the final shortlist of candidates who are selected for Boot Camp followed by Final Interview. More details below.

Shortlisted for Interview :

1. Subhajit Mondal
2. KUNAL BAKSI
3. Swarnil Kundu
4. Manisha Kumari
5. SAWAN KUMAR
6. Sohom Ghatak
7. Keshav kumar
8. D KUSHAL
9. Abhinav Anand

As a next step Electronics Center of Excellence (eCOE) will be conducting a "Boot Camp for Basic VLSI and Analog Layout" for this 9 and earlier 5 students that was already selected - making the count to 14. This is not a full-fledged training , but some of the topics discussed and assignments will be extremely relevant for Sankalp interview. Overall we'll have 15-20 hrs of theoretical sessions and close to 50 hrs of mini-project assignments, which students can do themselves at their convenience. We are happy to inform you that, for this time we'll be providing this boot camp without any fees and the classes will be held in the college VLSI lab itself.

For exact modalities of the boot camp and schedules , I'll coordinate with Prof. Krishanu.

Post completion of the Boot-camp , Final interview (tentative early January) will be scheduled which will include Group Discussion , Technical Interview and HR interview (all in a day for all 14). Those selected from these will receive the offer letter directly.

Thank you for the hospitality and great cooperation . Look forward to work more closely with your team.

Best Regards,
Mrinal

Mrinal Das
Electronic Center of Excellence
+917381974602



EmeRTeS 2019

January 7, 2019

International Workshop on Emergency Response Technologies and Services

in conjunction with ICDCN 2019
Indian Institute of Science, Bangalore, India

About the Workshop

The goal of the International Workshop on Emergency Response Technologies and Services - **EmeRTeS 2019** is to explore the application of new and innovative technology research towards improving emergency response and management. The focus is to provide an inter-disciplinary platform for researchers to exchange ideas, present results, share experience, stimulate new research, and foster collaborations among computer scientists, engineers, social scientists, representatives from government and non-governmental organizations and disaster science experts to develop recommendations for effective emergency response.

Call for Papers

Papers describing original research work and practical experiences/experimental results are solicited on topics that tentatively include, but are not limited to:

- Emergency communication infrastructures, technologies and services
- Peer-to-peer networks based emergency communication systems and protocols
- Modeling and simulation tools for emergency situations
- Crowd sourcing, remote sensing, cyber-physical systems for emergency response
- Coordination, collaboration and decision support systems
- Logistics and supply chain management in emergency response
- IoT based solutions for emergency response
- Querying and filtering of heterogeneous, multi-source and multi-modal situational data
- Post disaster damage and loss assessment
- Planning, foresight and risk analysis
- Security and privacy issues in situational information sharing
- Social media and networks for emergency response and management
- Web mapping and Geographic Information Systems (GIS) for emergency response
- Emergency management information systems and applications
- Community participation in emergency management

Paper Submission Guidelines

Authors are welcome to submit *regular papers* (6 pages, PDF format) describing original ideas written in English. The accepted papers will be indexed by the **ACM Digital Library**. Authors are also welcome to submit *work-in-progress papers* (2 pages, PDF format). In this case, final papers will be available to participants electronically, but to facilitate resubmission to more formal venues, no archival proceedings will be published, and papers will not be sent to the ACM Digital Library. At least one author of each accepted paper (regular or work-in-progress) must register for the conference and present the paper. In case of no-shows of accepted papers at the workshop will result in those papers NOT being included in the proceedings and will also not be made electronically available. Submissions should follow the [ACM proceedings formatting style](#). Papers must be submitted electronically in printable PDF form via the [HotCRP submission management system](#).

Organizers

Workshop Chairs

- Somprakash Bandyopadhyay, Indian Institute of Management Calcutta, India
- Sajal Das, Missouri University of Science and Technology, USA
- Sipra Das Bit, Indian Institute of Engineering Science and Technology, Shibpur, India

TPC Co-Chairs

- Simone Silvestri, University of Kentucky, USA
- Siuli Roy, Heritage Institute of Technology, Kolkata, India

Organizing Co-Chairs

- Souvik Basu, Heritage Institute of Technology, Kolkata, India
- Subrata Nandi, NIT Durgapur, India

Important Dates

Paper Submission:	September 30, 2018
Notifications:	October 30, 2018
Camera Ready:	November 15, 2018
Workshop Date:	January 07, 2019

Venue

Indian Institute of Science, Bangalore, India

Contact Details

For any further query mail to souvik.basu@heritageit.edu

Workshop Website

<https://sites.google.com/view/emertes2019>

International Workshop on Emergency Response Technologies and Services

in conjunction with ICDCN 2020
Hotel Hindustan International, Kolkata, India

About the Workshop

The goal of the 2nd International Workshop on Emergency Response Technologies and Services (EmeRTes) 2020 is to bring together researchers and practitioners from academia, government, NGO and industry in areas related to disaster management in order to gain experience and insight into the challenges that such environments pose for the people. The workshop is dedicated to the dissemination of original contributions that discusses solutions required to combat disaster situation.

Call for Papers

We expect submission from a wide ranging discipline and expect the workshop to be a meeting point for cross-discipline discussion whereby various facets of disaster management would get highlighted. Topics of interest include, but are not limited to:

1. Human Experiences in the Design of Crisis Response and Management Services and Systems

- Planning, Foresight and Risk Analysis
- Social Media and Collaborative Systems
- Dynamics of Need Analysis, Monitoring and Assessment
- Emergency and Disaster Prediction
- Collaborative decision-making
- Social Science aspects of Emergency Response and Disaster Management

2. Distributed Systems for Disaster Management

- Collaborative information systems architectures, technologies, and algorithms for crisis management
- Cooperative communication in Disaster Management
- Context awareness for distributed resource management
- Architectures, Middleware, Prototypes and Test-beds for Distributed Disaster Management
- Reliability, resilience and fault tolerance techniques in distributed environment
- Distributed Decision Support Methods for Complex Crisis
- Crowdsourcing platform for disaster preparedness and post disaster rescue/relief operation

3. Enabling Technologies and Systems

- Social Networking for Crisis Management
- Post disaster damage and loss assessment
- Geographical Information Systems for Crisis Response and Management

- Early Warning and Alerting Systems,
- Ad-Hoc Mobile Networks
- Opportunistic and Delay Tolerant Networks
- Data gathering, Fusion, Routing, Dissemination and Caching in Delay Tolerant Network/ Opportunistic networks
- Security, Trust, Privacy and Cooperation issues in Delay Tolerant Network/ Opportunistic networks
- Mobility models
- Interfaces and Methods for Interconnection of Heterogeneous Networks and Devices
- System Architectures, Resource Discovery, Retrieval, Scheduling, Allocation, Monitoring
- Heterogeneous Wireless Connectivity Management
- Community participation in emergency management

Paper Submission Guidelines

Authors are welcome to submit *regular papers* (6 pages, PDF format) describing original ideas written in English. Authors are also welcome submit *short papers* (4 pages, PDF format). The accepted papers will be indexed by the ACM Digital Library. At least one author of each accepted paper (regular or short) must register for the conference and present the paper. In case of no-shows of accepted papers at the workshop will result in those papers NOT being included in the proceedings and will also not be made electronically available. Submissions should follow the [ACM proceedings formatting style](#). Papers must be submitted electronically in printable PDF form via the EasyChair page here: <https://easychair.org/conferences/?conf=emertes2020>.

Important Dates

Paper Submission:	September 27, 2019
Notifications:	October 16, 2019
Camera Ready:	October 24, 2019
Workshop Date:	January 07, 2020

Organizers

Workshop Chairs

- Somprakash Bandyopadhyay, Indian Institute of Management Calcutta, India
- Sajal Das, Missouri University of Science and Technology, USA

TPC Co-Chairs

- Simone Silvestri, University of Kentucky, USA
- Siuli Roy, Heritage Institute of Technology, Kolkata, India

Organizing Chair

- Souvik Basu, Heritage Institute of Technology, Kolkata, India

Contact Details

For any further query mail to souvik.basu@heritageit.edu
or call +919903998511

Workshop Website

<https://sites.google.com/view/emertes2020>

International Workshop on Emergency Response Technologies and Services

in conjunction with ICDCN 2021
Nara Kasugano International Forum IRAKA, Nara, Japan

About the Workshop

The goal of the 3rd International Workshop on Emergency Response Technologies and Services (EmeRTes) 2021 is to bring together researchers and practitioners from academia, government, NGO and industry in areas related to disaster management in order to gain experience and insight into the challenges that such environments pose for the people. The workshop is dedicated to the dissemination of original contributions that discusses solutions required to combat disaster situation.

Call for Papers

We expect submission from a wide ranging discipline and expect the workshop to be a meeting point for cross-discipline discussion whereby various facets of disaster management would get highlighted. Topics of interest include, but are not limited to:

1. Human Experiences in the Design of Crisis Response and Management Services and Systems

- Planning, Foresight and Risk Analysis
- Social Media and Collaborative Systems
- Dynamics of Need Analysis, Monitoring and Assessment
- Emergency and Disaster Prediction
- Collaborative decision-making
- Social Science aspects of Emergency Response and Disaster Management

2. Distributed Systems for Disaster Management

- Collaborative information systems architectures, technologies, and algorithms for crisis management
- Cooperative communication in Disaster Management
- Context awareness for distributed resource management
- Architectures, Middleware, Prototypes and Test-beds for Distributed Disaster Management
- Reliability, resilience and fault tolerance techniques in distributed environment
- Distributed Decision Support Methods for Complex Crisis
- Crowdsourcing platform for disaster preparedness and post disaster rescue/relief operation

3. Enabling Technologies and Systems

- Social Networking for Crisis Management
- Post disaster damage and loss assessment
- Geographical Information Systems for Crisis Response and Management

- Early Warning and Alerting Systems,
- Ad-Hoc Mobile Networks
- Opportunistic and Delay Tolerant Networks
- Data gathering, Fusion, Routing, Dissemination and Caching in Delay Tolerant Network/ Opportunistic networks
- Security, Trust, Privacy and Cooperation issues in Delay Tolerant Network/ Opportunistic networks
- Mobility models
- Interfaces and Methods for Interconnection of Heterogeneous Networks and Devices
- System Architectures, Resource Discovery, Retrieval, Scheduling, Allocation, Monitoring
- Heterogeneous Wireless Connectivity Management
- Community participation in emergency management

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For each accepted workshop paper to appear in the ACM digital library, at least one author of the paper must register as a regular registrant even if he/she is a student, and the paper must be presented in the workshop by one of its authors. Papers must be submitted electronically in printable PDF form via the EasyChair page here: <https://easychair.org/conferences/?conf=icdcn2021>.

Important Dates

Paper Submission:	September 20, 2020
Notifications:	October 10, 2020
Camera Ready:	October 20, 2020
Workshop Date:	January 05, 2021

Organizers

Workshop Chairs

- Somprakash Bandyopadhyay, Indian Institute of Management Calcutta, India
- Sajal Das, Missouri University of Science and Technology, USA

TPC Co-Chairs

- Simone Silvestri, University of Kentucky, USA
- Siuli Roy, Heritage Institute of Technology, Kolkata, India

Organizing Chair

- Souvik Basu, Heritage Institute of Technology, Kolkata, India

Contact Details

For any further query mail to souvik.basu@heritageit.edu
or call +919903998511

Workshop Website

<https://sites.google.com/view/emertes2021>

Hm²Sc: Human Movement Model for Post Disaster Scenario in Smart City

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ABSTRACT

In this work, we propose a human movement model that characterizes the movement pattern of different stakeholders in a post-disaster scenario in smart city. Knowledge about such mobility pattern assists in designing fast deployable smartphone based delay-tolerant network for disseminating post-disaster crucial situational information in a smart city. To the best our knowledge, this model is a major step ahead in the arena of mobility models for a post-disaster scenario in a smart city environment specifically considering the rescue operations. We provide extensive analytical foundations to strengthen the proposed mobility model. Simulation results justify that routing protocols when applied with proposed movement model, optimize network performances in terms of delivery ratio, overhead ratio and average residual energy at the cost of tolerable latency.

KEYWORDS: DTN; human mobility model; movement model; post-disaster scenario; smart city.

ACM Reference format:

Nabanita Das, Souvik Basu and Sipra Das Bit. 2018. Hm²Sc: Human Movement Model for Post Disaster Scenario in Smart City. In *Proceedings of Complex Networked Systems for Smart Infrastructure (C-NetSys'18)*, ACM, October 29, 2018, New Delhi, India, ACM, NY, NY, USA., 6 pages. <https://doi.org/10.1145/3265997.3265998>.

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ACM ISBN 978-1-4503-5927-6/18/10...\$15.00
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1 Introduction

Smart cities have recently become the mainstream approach for urbanization. In smart cities, various sensors like water gauge, rain gauge, beam sensor, seismometer, smoke sensor, etc. are integrated with near field communication (NFC) and radio frequency identification (RFID) technologies to collect data for further processing and analyzing [1]. Confronted by a disaster in a smart city situational information regarding the location, condition, and requirements of the victims can be collected from already installed sensors around the city.

Dissemination of such situational information amongst different stakeholders like disaster management authorities, emergency service providers, and citizens is of crucial importance for effective disaster response [2]. However, owing to the typical disruption of cellular and Internet connectivity during disasters [3], the possibility of transmitting situational information using conventional communication infrastructure gets almost ruled out. The networking research community has strongly proposed the use of delay tolerant networks (DTN) in such a challenged network scenario [4]. Increasing penetration of smartphones and their integration with Bluetooth and WiFi direct can be effectively harnessed to form a DTN during or after a disaster. Thus, the smartphones carried by volunteers, rescue workers, victims, and supply-vehicle-drivers can form a peer-to-peer DTN and opportunistically exchange situational information collected by different sensors deployed around the city.

The success of information exchange in such a smartphone based DTN depends on the mobility of the smartphone users. The mobility of these users is, in turn, governed by user behavior and association [5]. Knowledge about the mobility pattern of these stakeholders is crucial

A Blockchain Based Incentive Scheme for Post Disaster Opportunistic Communication over DTN

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ABSTRACT

Delay tolerant network (DTN) is successfully proposed for setting up emergency post disaster communication networks when normal communication infrastructure is incapacitated. Performance of such networks get affected by selfish nodes that do not participate in message forwarding. Thus, nodes must receive satisfactory rewards for cooperation. The available incentive schemes either rely on central trusted authorities or do not use an explicit and secure digital currency. Blockchain, a decentralized digital ledger of immutable transactions, is an attractive approach for addressing the incentive challenges in peer-to-peer networks that lack central trusted authorities. Bitcoin, the Blockchain based cryptocurrency, make it possible to devise practical credit based incentive schemes for such networks. In this paper, we propose a Blockchain based incentive scheme for DTN based post disaster communication network that uses Bitcoin to incentivize nodes for cooperation. The scheme uses a novel reward strategy to bring rationality in the incentivizing process.

CCS CONCEPTS

• Networks~Peer-to-peer networks • Networks~Mobile ad hoc networks • Security and Privacy~Mobile and wireless security

KEYWORDS

Delay tolerant network, Post disaster communication, Incentive mechanism, Blockchain network, Bitcoin system, Reward model

ACM Reference format:

Chandrima Chakrabarti and Souvik Basu. 2019. A Blockchain Based Incentive Scheme for Post Disaster Opportunistic Communication over DTN.

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<https://doi.org/10.1145/3288599.3295584>

1 Introduction

Disaster management is essentially information management. However, owing to the fact that, cellular communication facilities become nonfunctional during disasters [1], it becomes difficult to collect situational information from remote and inaccessible shelters and transmit them to the emergency operation center (EOC). The networking research community has strongly proposed the use of smartphone based delay tolerant networks (DTNs) for setting up an emergency post disaster communication network [1 – 4]. Increasing availability of smartphones and their integration with technologies like Wi-Fi Direct, Bluetooth, etc. [5] can be effectively harnessed to form a DTN during or after disaster. Thus, the success of a DTN is highly dependent on the cooperation of these forwarder-nodes and selfish behaviors lead to low delivery ratio and long delivery latency [1, 6]. One solution to this challenge is to provide incentives to stimulate these forwarder-nodes to participate in forwarding activity by rewarding them with actual money or credit. However, the properties of an opportunistic peer-to-peer network bring challenges into the design of an incentive mechanism. First, if a sender rewards a selfish node beforehand, the node will not faithfully store-carry-forward the message to the receiver and indulge in a dine and dash behavior [7]. Second, a sender do not know who will be the forwarder-nodes and how many such nodes will get involved; thus it is hard to know who will be rewarded and how much reward is to be paid [8]. Finally, forwarder-nodes may have different constraints on consumed resources and different expectations about the incentive.

Several credit based approaches [9 – 14] have been reported towards devising efficient incentive mechanisms for DTNs, where incentives are provided by paying credit or virtual money to the cooperative forwarder-nodes. However, most credit based incentive schemes either rely on a central trusted authority or do not give an explicit digital currency system that is provably secure [8]. Blockchain [15] is a decentralized, digital public transaction ledger of the cryptocurrency Bitcoin [16, 17] that can record transactions between two parties in a verifiable and permanent way without a central trusted authority. Bitcoin, the most practical digital currency, makes it possible to devise practical credit based incentive schemes for P2P networks.

In this paper, we propose a Blockchain based incentive scheme for a DTN enabled smartphone leveraged post disaster

A Human Mobility Based Knowledge Sharing Approach for Post Disaster Need Assessment using DTN

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ABSTRACT

In a post disaster scenario, assessment of resource needs is indeed challenging because needs are constantly changing and supplies trickle in at an uncertain rate. Moreover, information about resource needs of far-flung areas get rarely permeated owing to the disruption of cellular and other communication infrastructure, leading to a huge gap in perception about the actual needs in those areas. Therefore, a dynamic need assessment mechanism is essential to stay abreast of the actual situation. Movements of volunteers and relief workers are governed by two dominant characteristics of human mobility - spatial locality and spatial regularity. In this paper, we make use of such mobility characteristics to propose a knowledge sharing based approach for dynamic assessment of post disaster resource needs using a smart-phone based delay tolerant network (DTN). The proposed technique caters to the objective of bridging the gap in perception about actual resource needs.

CCS Concepts

• **Networks~Peer-to-peer protocols** • *Networks~Mobile ad hoc networks* • *Networks~Wireless personal area networks*

General Terms

Performance, Experimentation, Human Factors.

Keywords

DTN, Post Disaster Situation Awareness, Need Assessment, Knowledge Sharing, Human Mobility Pattern.

1. INTRODUCTION

Improving situational awareness and conducting appropriate need assessment is one of the main goals of efficient decision making as it is critical for the success of relief operation in the first 72 hours of a disaster [1]. However, in almost all disaster need assessment initiatives there prevails a huge gap between the actual condition of a shelter and the perception of that condition at the control station. The more the shelter is away from the control station, more is the gap in perception. Such poorly conducted need assessments lead to inadequate and irrational resource distribution. Therefore, decision makers

should use systematic need assessment techniques to develop a coherent global picture of resource needs in the entire disaster

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DOI: <http://dx.doi.org/10.1145/2833312.2833461>

struck area [2]. Owing to the fact that, cellular and other traditional communication becomes non-functional during disasters [3], it becomes difficult to collect situational data from different remote shelters. As a solution, the networking research community has strongly proposed the use of DTN for setting up of emergency communication networks [4, 5, 6]. Increasing availability of smart phones and PDAs, and their integration with technologies like Bluetooth, Wi-Fi direct, etc. can be effectively harnessed to form a DTN during or after disaster. Volunteers and rescue workers using these devices can gather and opportunistically exchange situational information to build a coherent global view of resource needs at the control station.

Volunteers, while carrying out relief operations, usually move within a local region (exhibiting spatial locality) and periodically visit a few other regions (exhibiting spatial regularity) [7]. In this paper, we exploit such human mobility characteristics to propose a dynamic need assessment technique based on opportunistic knowledge sharing, where more accurate local knowledge is shared with distant nodes during relatively fewer interactions between them. This technique reduces the gap in perception and develops a coherent global view of emergency resource needs at the least possible time for proper matchmaking between the needs and supplies. Although such global view may not be accurate to the highest precision but can always serve as a basis of resource allocation to far-flung shelters whose requirements were hitherto unknown.

The rest of the paper is organized as follows. Section 2, summarizes related work in this field, Section 3 describes the system architecture related to our work and Section 4 presents the Dynamic Need Assessment Technique. Section 5 provides experimental results. We conclude the paper with a direction towards future work in Section 6.

2. RELATED WORK

Researchers have proposed that the mobile devices carried by volunteers may be used to set up a DTN for collection of critical information in a disaster environment. However, as suggested by Wang et al. in [7], mobility of these devices is controlled by their carriers, the human beings, and mobility of human beings is driven by their sociality. [7] and [8] introduce two important human mobility characteristics, which are obtained by analyzing the CRAWDAD trace set [9]. These characteristics are (i) spatial regularity and (ii) spatial locality. Spatial regularity property of human mobility indicates that people generally return to a few frequently visited places while spatial locality suggests that they usually move within a local region. Results in [8] and [9] suggest that the mobile nodes are found at their first two preferred locations with a probability over 70%, suggesting spatial locality. Analogous human mobility characteristics are

CNN Based Approach for Post Disaster Damage Assessment

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ABSTRACT

After any disaster, the Government rehabilitates the victims based on the severity of the damage caused to their properties. Since a huge number of rehabilitation claims flow in after the disaster, it takes up a lot of manual labor in inspecting and validating the claims along with deciding the amount of rehabilitation to be granted. Moreover, such manual inspection leads to a lack of transparency. In recent years, social media posts, text, and images have become a rich source of post-disaster situational information that may be useful in assessing damage at a low cost. Most of the existing research explores the use of social media text for extracting situational information useful for disaster response. The usage of social media images to assess disaster damage is limited. In this paper, we propose a convolutional neural network-based approach to locate damage in a disaster image and to quantify the degree of the damage. The proposed damage assessment system categorizes images of earthquake-affected buildings and decides the severity of the damage caused by the earthquake. Our proposed approach enables the use of social media images for post-disaster damage assessment and provides an inexpensive and feasible alternative to the more expensive GIS approach. Our approach exhibits high accuracy in classifying earthquake-affected buildings and determining the severity of damage at a negligible loss.

CCS CONCEPTS

• Computing methodologies → Machine learning → **Machine learning approaches** • Computing methodologies → Machine learning → Machine learning approaches → **Neural networks**

KEYWORDS

Damage Assessment, ImageNet, Transfer Learning, VGG16, VGG19

^{*} CNN Based Approach for Post Disaster Damage Assessment

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1 Introduction

A fast and accurate damage assessment system that detects the severity of damage after a disaster can accelerate real-time response and effective rehabilitation [1]. Most of the existing studies on detecting and assessing disaster damage rely heavily on macro-level images, such as remote sensing imageries or imageries transmitted by unmanned aerial vehicles. Collection and analysis of macro-level images require costly resources, including expensive equipment, complex data processing tools and good weather conditions. To benefit the response teams, the macro-level images have to be collected and analyzed very fast, which is not always possible with traditional collection and analysis methods.

With the growth of social media platforms in recent years, real-time disaster-related information is readily available in the form of network activity. Abundant text and images are posted by eyewitnesses of disasters on platforms such as Twitter, Facebook, Instagram or Flickr. Many studies have shown the utility of social media text for disaster management and response teams [2, 3]. However, social media images, while very informative, have not been extensively used to aid disaster response, primarily due to the complexity of information extraction from (noisy) images, as compared to information extraction from text. In contrast to macro-level images, social media images have higher “resolution”, in the sense that they can provide detailed on-site information from the perspective of the eyewitnesses of the disaster. Thus, social media images can serve as a rich source of visual information in post disaster damage assessment.

Pioneering works [4 - 8] on classifying social media images for disaster response use CNN to assess the severity of the damage as the pre-processing required in a CNN is much lower as compared to other classification algorithms. Hamed et al. in [4] propose an approach to identify collapsed buildings after an earthquake using

Efficient DropBox Deployment toward Improving Post-Disaster Information Exchange in a Smart City

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In the face of a disaster, the already installed gadgets in a smart city can be leveraged to gather post-disaster situational information. However, owing to the typical disruption of cellular and Internet connectivity during disasters, the possibility of transmitting situational information using conventional communication infrastructure is almost ruled out. The networking research community has strongly proposed the use of delay tolerant networks (DTN) in such challenged network scenario. In this article, we exploit the movement of volunteers carrying smartphones in such a scenario to form a DTN and propose a utility-based DropBox deployment scheme toward improving post-disaster situational information exchange. In this scheme, DropBoxes are deployed across the network at high utility locations. Since the effectiveness of the proposed scheme can be evaluated accurately considering an appropriate post-disaster mobility model suitable for smart cities, we present a human movement model for a post-disaster scenario in a smart city. This movement model is shown to have better performance over other competing movement models in a post-disaster smart city environment. An extensive simulation is performed using ONE simulator to evaluate the comparative performance of the proposed DropBox deployment scheme with some state-of-the-art existing deployment schemes using the presented movement model. Simulation results justify the proposed DropBox deployment scheme improves network performances in terms of delivery ratio, overhead ratio, and average residual energy at the cost of tolerable latency.

CCS Concepts: • **Networks** → **Network types; Mobile networks; Ad hoc networks; Mobile ad hoc networks; Network properties; Network mobility; Network performance evaluation; Network performance analysis;**

Additional Key Words and Phrases: Delay tolerant networks, dropbox deployment, human mobility model, post-disaster scenario, smart city

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Wise-PRoPHET: A Watchdog supervised PRoPHET for reliable dissemination of post disaster situational information over smartphone based DTN

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ABSTRACT

Delay tolerant network (DTN) has been successfully proposed for setting up emergency post disaster communication networks when normal communication infrastructure is typically incapacitated. These networks work on the basis of cooperation from participating nodes, which is cost-intensive in terms of battery life, computation, etc. Therefore, nodes can refuse to cooperate to save resources, giving rise to selfish nodes that hinder the transmission of sensitive post disaster situational messages. Another issue is the presence of malicious nodes that collude to either spoil the reputation of honest nodes or boost the reputation of selfish nodes. The existing DTN routing protocols, like PRoPHET, do not address these issues. In this paper, a trust based Watchdog technique is seamlessly integrated with PRoPHET so that situational messages are successfully delivered even in the presence of selfish and malicious nodes. The Watchdog monitors its neighbouring nodes to generate a local perception about their forwarding behaviour. This information is then disseminated in the network to build a global perception of forwarding behaviour for detection of selfish nodes. The local perception is further used to identify malicious nodes in the network. The proposed technique rationalizes self-trusting, a property of trust based data forwarding in opportunistic networks which reduces and delays message transfers, to further improve delivery ratio and delay. Results of extensive simulation, using ONE simulator, substantiate the efficiency of the proposed Watchdog enabled PRoPHET over state-of-the-art competing schemes, in terms of detection ratios, attraction ratio, etc. while not compromising standard network performance. Finally, it is claimed that the proposed technique, tolerates a reasonable percentage of selfish and malicious nodes to achieve a desirable level of network performance, in a post disaster communication scenario.

1. Introduction

Disaster management is essentially information management because facilitating the access, exchange and diffusion of reliable situational information are most important for effective decision making and risk reduction (International Federation of Red Cross and Red Crescent Societies, 2013). However, owing to the fact that, cellular and other traditional communication facilities become non-functional during disasters (Luo et al., 2010), it becomes difficult to collect and exchange situational information from remote and inaccessible shelters. The networking research community has strongly proposed the use of delay tolerant network (DTN) for setting up an emergency post disaster communication network (Fall et al., 2010; Chenji et al., 2011; Ntareme

et al., 2011; Campillo et al., 2013). The DTN offers store-carry-forward protocols that enable communication during impaired connectivity, although with certain delay (Jain et al., 2005). Increasing availability of smartphones and their integration with technologies like Bluetooth, WiFi direct, etc. can be effectively harnessed to form a DTN during or after a disaster. Volunteers and relief workers carrying such devices working in the DTN mode can opportunistically exchange situational information.

Flooding-based DTN routing protocols, like Epidemic (Vahdat and Becker, 2000), forward many replicas of the same message and consumes much resources; making them inappropriate for resource constrained smartphone based DTN. Probability-based routings, like PRoPHET (Lindgren et al., 2003) and MaxProp (Burgess et al., 2006), forward a message to a node having the highest probability of encountering the

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Best-effort Delivery of Emergency Messages in Post-disaster Scenario with Content-based Filtering and Priority-enhanced P_{Ro}PHET over DTN

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Abstract—Despite concerted efforts for relaying crucial situational information, disaster relief volunteers experience significant communication challenges owing to failures of critical infrastructure and longstanding power outages in disaster affected areas. Researchers have proposed the use of smart-phones, working in delay tolerant (DTN) mode, for setting up a peer-to-peer network enabling post disaster communication. However, due to opportunistic contacts, intermittent connectivity and constrained resources (mainly battery) of mobile devices, not all messages get forwarded in such a network. As a result, several crucial messages, waiting in the buffer may get dropped and unimportant, extraneous (sentimental comments of victims, etc.) messages may get transmitted at the cost of expensive network resources. Therefore, filtering out such irrelevant messages (containing unrelated information and emotional expressions) and prioritizing relevant messages according to its importance becomes crucial so that messages which are critical for decision making receive the highest priority and get disseminated in the network at the minimum possible time. In this paper, our objective is to ensure best-effort delivery of emergency messages using a two-step approach, (i) segregation of high priority messages through natural language processing based filtering and (ii) dissemination of filtered messages over DTN using a Priority-enhanced P_{Ro}PHET routing protocol which is developed by adapting the popular P_{Ro}PHET routing protocol. The protocol successfully achieves on-the-fly message prioritization and ensures best effort delivery of such prioritized messages to their appropriate destinations. The proposed protocol is evaluated using the ONE simulator. Simulation results suggest that our protocol outperforms other well known DTN routing protocols like P_{Ro}PHET, Spray-And-Wait, MaxProp and Epidemic in terms of delivery ratio of prioritized messages and overhead ratio.

Keywords—Delay Tolerant Networks; Post Disaster Communication Network; Message Prioritization; Message Filtering; P_{Ro}PHET Routing Protocol; Natural Language Processing

I. INTRODUCTION

After the April 2015 Nepal earthquake that had a magnitude of 7.8 and epicenter at Lamjung [1], teams from all over the world thronged Nepal for offering rescue and relief services. One such team from Doctors For You (DFY) [2], a pan-India humanitarian organization with international

presence, also visited Nepal for the same purpose. Volunteers and rescue workers of the team created a communication group in WhatsApp for intragroup message exchange for improving situational awareness and conducting appropriate need assessment during the first few days after the disaster.

However, owing to the fact that, cellular and other traditional communication infrastructure was considerably incapacitated in the remote areas of Nepal, viz. Bidur, Gorkha Bazaar, Charikot, etc., the WhatsApp group could exchange messages only when cellular connectivity was available. Such intermittent connectivity could communicate only a few messages leaving out hundreds of other messages waiting in the devices. Similar bottlenecks were experienced by other teams like ACF, France and Qatar Red Crescent Society working in and around Nepal, who tried to communicate with team members through WhatsApp or any other allied messaging services. Since messages sent by users were not categorized and prioritized, quite a number of messages consisting emotional and extraneous content got transmitted and messages containing critical information had to starve for opportunities of getting relayed. This led to a huge gap in communication that impeded the ultimate goal of disaster relief.

Thus, it becomes imperative to filter out irrelevant messages and prioritize all relevant messages before they are considered for transmitting or forwarding. On the other hand, the networking research community has strongly proposed the use of DTN for setting up of emergency communication networks [3 – 5]. Increasing availability of devices like smart phones and PDAs, and their integration with technologies like Bluetooth, Wi-Fi direct, etc. can be effectively harnessed to form a DTN during or after a disaster. Volunteers and rescue workers using these devices can gather and opportunistically exchange situational information to build a coherent global view of resource needs at the control station.

In this work, we propose a scheme that segregates decisive messages and prioritizes them according to their importance so that crucial messages receive the highest priority and get forwarded in the opportunistic network at the first possible opportunity. The scheme performs a content based message filtering using natural language processing (NLP) and a first

A Post-Disaster Demand Forecasting System Using Principal Component Regression Analysis and Case-Based Reasoning Over Smartphone-Based DTN

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Abstract—The most dominant challenges in post-disaster emergency resource planning are forecasting the exact demand for emergency resources, communicating such demands to the control station, and validating these demands before using them for resource planning. Forecasting the exact demand for resources in a relief shelter becomes tricky, because situational parameters influencing these demands keep on changing. Moreover, the collection and transmission of demands of far-flung shelters are challenging, owing to the post-disaster disruption of communication infrastructure. All these lead to ad hoc allocation of emergency resources to the shelters. In this paper, we first derive a principal component regression model to forecast demand for emergency resources based on situational parameters at the shelters. Subsequently, we propose an opportunistic demand sharing scheme for gathering and disseminating resource demands to the control station using a smartphone-based delay-tolerant network (DTN). Finally, we suggest a case-based reasoning driven demand validation technique to ratify these demands and also to project the demands that do not get transmitted. Experimental results show that our system forecasts dynamically changing resource demands at the shelters with high precision, transmits near accurate demands to the control station, and perfectly validates the received resource demands.

Index Terms—Case-based reasoning (CBR), delay-tolerant network (DTN), forecasting, principal component regression analysis (PCRA), post-disaster situation awareness, resource demand.

I. INTRODUCTION

THE AFTERMATH of a disaster requires the establishment of a sustained relief chain for supplying relief items like food, water, accommodation, medicines, etc., to the affected population [1]. However, shutdown of warehouses due to disaster impacts planning, allocation, and supply of such relief items [2]. Due to lack of, or inaccurate need assessments immediately after a disaster, relief chains are generally set up based on rough estimates by logisticians regarding what people would normally

need. The effectiveness of this relief chain depends on the competencies and experience of these logisticians in charge [3], often leading to ad hoc allocation of typically scarce emergency resources. Therefore, a scientific prediction model is of utmost importance, which would forecast the demand for post-disaster emergency resources with the best possible precision [4], [5].

Demand for emergency resources in a post-disaster relief shelter is determined by several influencing situational parameters prevailing in the shelters, whose values are highly varying and evolve with the changing dynamics of the disaster. Therefore, any prediction model that aims to forecast the demand for emergency resources should be based on these dynamically changing parameters. This calls for deriving a mathematical relationship between the demand for emergency resources and these influencing situational parameters. In this paper, we derive a principal component regression (PCR) model for forecasting post-disaster emergency resource demands in a shelter, based on influencing situational parameters. The derived model can be used to periodically forecast the dynamic demand for different emergency resources at shelters with high precision.

Any large-scale natural disaster like flood, cyclone, earthquake, etc., has a severe impact on communication infrastructure. Services through cellular network/internet immediately become nonfunctional or partially functional in emergencies. Therefore, it becomes difficult to collect these resource demands from remote and inaccessible shelters, resulting in high perception deviation at the control station about the actual needs.

Recent years have witnessed an enormous proliferation of wireless devices, such as smartphones and tablets, with various device-to-device connectivity options, such as WiFi direct, Bluetooth, etc. These devices with their capabilities can be used in a post-disaster scenario to form a delay-tolerant network (DTN). DTN offers store-carry-forward protocols that enable communication during impaired connectivity, although with a certain delay. The networking research community has strongly proposed the use DTN for setting up emergency post-disaster communication networks using smartphones working in the DTN mode [6]–[9]. Thus, we assume that an underlying DTN leveraged smartphone based communication network exists and use an opportunistic demand sharing scheme to collect and transmit the demand for emergency resources at different shelters to the control station.

DTNs are characterized by inconsistent end-to-end paths, intermittent connectivity, and unpredictable latency leading to

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A Utility Driven Post Disaster Emergency Resource Allocation System Using DTN

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Abstract—Two of the most dominant challenges in post disaster emergency resource allocation are: 1) understanding the exact utility, i.e., exigency, of emergency resources and 2) collecting and transmitting the need for these resources to the control station from where resources are allocated. Measuring the utility of resources with precision becomes tricky in a dynamic post disaster scenario, where demands are constantly evolving and supplies trickle in at an uncertain rate. Moreover, collection and transmission of resource needs of far-flung areas are easier said than done owing to the post disaster disruption of communication infrastructure. These result in the *ad-hoc* allocation of emergency resources to the shelters. In this paper, we first derive a utility function for dynamically enumerating the shelter specific utility of each emergency resource. Subsequently, we propose an opportunistic knowledge sharing scheme for gathering and disseminating resource needs to the control station using a smartphone-based delay tolerant network. Finally, based on these opportunistically transmitted needs, we formulate a utility driven optimal resource allocation model which minimizes overall resource deficit and total resource deployment time. The proposed system optimally assigns constrained emergency resources to different shelters, so that high-utility resources are deployed fast. The effectiveness of the proposed system is evaluated using ONE simulator and LINGO optimization modeling tool. Exhaustive simulation is done to evaluate the comparative performance of our system with a number of competing schemes. Results show that our system outperforms all these schemes in a fully connected scenario. It is also observed that even in an intermittently connected environment, the performance of our system is almost at par with the competing schemes.

Index Terms—Delay tolerant network (DTN), human mobility pattern, integer programming, opportunistic knowledge sharing, optimal resource allocation, post disaster situation awareness, utility function.

I. INTRODUCTION

DISASTERS like hurricanes, earthquakes, floods, and others cause immense physical destruction and loss of

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life and property around the world [1]. An efficient disaster relief response network consists in coordinating the distribution of emergency resources from supply centers to the shelters in affected areas [2]. Also, the rationality of emergency resource allocation directly affects the effectiveness of relief operation [3]. Thus, distribution of scarce emergency resources among competing affected areas requires appropriate allocation methods so that such resources can be utilized effectively in post disaster relief operations. Computational tools are needed to make data-driven disaster mitigation planning accessible to planners and policymakers [4].

While responding to a post disaster emergency situation with constrained availability of resources, failing to understand the utilities of those resources leads to futile allocation strategies. While demand represents the quantity of resource required, utility depicts the urgency of that requirement. Researchers have proposed network resource allocation strategies based on utility functions defined over transmission rates, quality of service, and potential delays. We take motivation from this and aim to propose a utility aware emergency resource allocation system so that a shelter having higher utility for a resource gets priority. However, quantifying a subjective notion like utility is somewhat challenging. In this paper, we derive a utility function that dynamically and quantitatively enumerates the utility of each emergency resource and use this function to measure the exigency of such resources.

Formulation of an effective resource allocation model requires dissemination of the resource requirements of the shelters to the control station. However, nonfunctioning of cellular and other traditional communication infrastructure during disasters [5], makes it difficult to collect such needs from the remote and inaccessible shelters. The networking research community has strongly proposed the use of delay tolerant network (DTN) for setting up an emergency post disaster communication network using the WiFi Direct or Bluetooth interfaces of the smartphones, carried by volunteers and rescue workers, working in the DTN mode [6]–[8]. The DTN offers store-carry-forward protocols that enable communication during impaired connectivity, although with a certain delay. In this paper, we assume an underlying DTN enabled smartphone-based communication network and propose an opportunistic knowledge sharing scheme. The scheme uses stable human mobility characteristics to build a coherent global view of resource needs in the entire disaster affected area. Such needs are opportunistically transmitted to the control station at regular intervals.

Chapter 3

Using Blockchain in Intermittently Connected Network Environments



Souvik Basu, Soumyadip Chowdhury, and Sipra Das Bit

Abstract This chapter explores the possible integration of blockchain technology with intermittently connected networks, towards exploiting the utility and availability of blockchain technology in intermittently connected network environments. It also identifies the challenges of such integration and possible solutions using off-the-shelf technology. Finally, the chapter identifies open research areas in the domain of using blockchain in intermittently connected network environments that would foster new research avenues in both industry and academia.

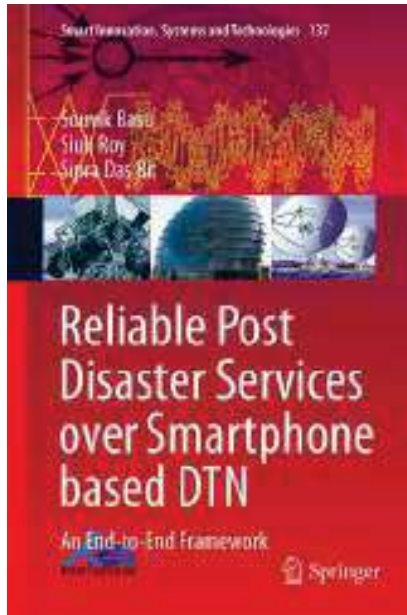
3.1 Introduction

Blockchain [1–3] technology represents a technological innovation that is supposed to alter our lives in several aspects like the way we conduct business, manage assets, use machines, visit hospitals, cast votes, rent cars and even prove our identity. Apart from these traditional and urban applications, other specialized blockchain use cases can be disaster management, remote healthcare in developing countries, vehicular communications or even deep-space communications. However, in one hand, these specialized use cases are characterized by absence of traditional communication infrastructure, intermittent connectivity and disconnection of devices due to limitations of power, node mobility and sparse node density. On the other hand, the usage of blockchain is restricted by the user's access to end-to-end internet connection. This limitation restricts the use cases to access blockchain and prevents its adoption in intermittently connected network environments. In fact, reliance on the internet is

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