BIRLA INSTITUTE OF TECHNOLOGY MESRA

OFF-CAMPUS DEOGHAR

HEAD TALK

Prof. R. C. Jha

Director

BIT Off-Campus Deoghar

Topic

Overview of BIT Off-Campus Deoghar

VISION

To become a recognised academic institution striving continuously for excellence in education, research and technological service to the Nation.

MISSION

- To equip students with the requisite skills to perform challenging engineering and managerial jobs in industry.
- To augment the teaching learning skills and research potential of the faculty.
- To provide excellent technological services satisfying industrial requirements and academic needs of the society in general and especially the deprived society of Jharkhand.

ABOUT THE INSTITUTE

- Established in 2007, under an MoU with the Govt. of Jharkhand.
- The first batch initiated in 2007, with the following programs
    - B.E. in Computer Science & Engg.
    - B.E. in Electronics & Communication Engg.
    - B.E. in Electrical & Electronics Engg.
- In 2008, two more programs were included
    - B.E. in Mechanical Engg.
    - B.E. in Production Engg.
- B.E. program was restructured to B.Tech. in 2018, under the CBCS scheme.
- BBA and BCA courses started in 2020.
- Lateral entry into B.Tech. program started in 2020.
- B.Tech. in Production Engg. was discontinued in 2021.

INFRASTRUCTURE

- The institute consists of two blocks: **Block-1** and **Block-2**
- **Block-1** contains:
    - Administrative Offices
    - Academic Departments and the concerned laboratories
    - Classrooms and Seminar Halls
    - Canteen

INFRASTRUCTURE

- **Block-2** contains the
    - Central Workshop
    - Two Classrooms.

FACILITIES IN THE CAMPUS

- Two Boys' Hostels, each having a capacity of 306 students.
- One Girls' Hostel, having a capacity of 300 students.
- Transit Guest House
- Sports Ground
- Open Air Auditorium
- Dispensary
- Grocery and Stationery Shop
- Canteen
- ATM
- 64 nos. of Staff quarters
- Broadband internet service of 100mbps

FACULTY MEMBERS & STAFF

Department	Professor	Associate Professor	Assistant Professor	Associate Lecturer	Total
CSE	-	-	8	4	12
ECE	-	2	7	1	10
EEE	1	-	6	1	8
MECH	1	1	6	-	8
Physics	-	-	3	-	3
Chemistry	-	-	2	-	2
Mathematics	-	-	3	-	3
Humanities & Mgmt.	-	-	2+ 2 (V. AP)	-	4

	Assistant Registrar	Accountant	Total
Officers	3	1	4

PUBLICATIONS & SPONSORED PROJECTS

Journal Publications (last three years)	Conferences (last three years)	Books/Book Chapters (last three years)	Patents	Projects Ongoing	Projects Applied (last one years)
89	22	28	4	1 (Rs. 7,15,440/-)	11

 # Total three projects have been completed

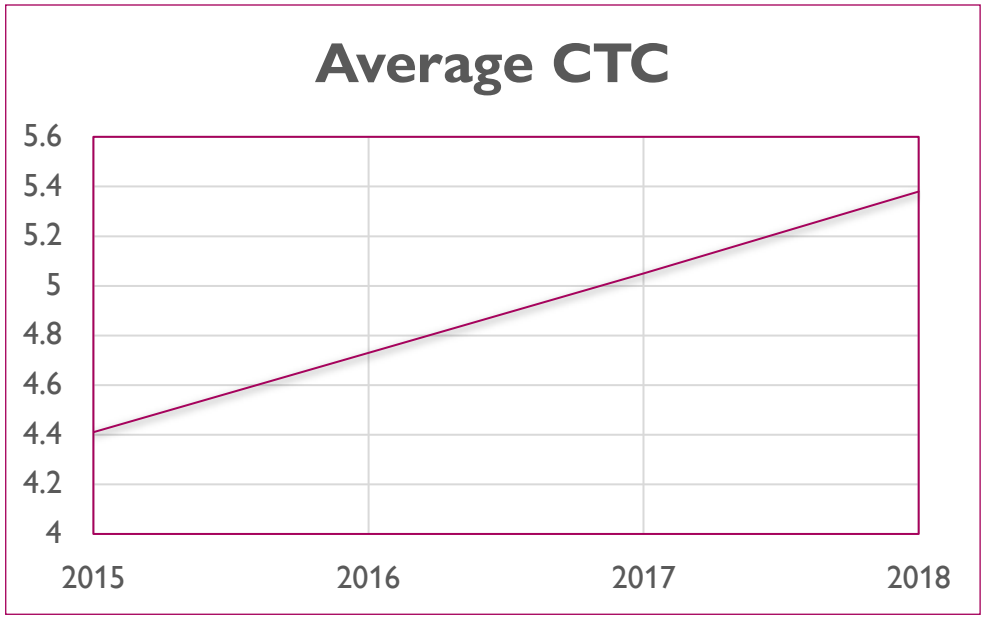
PROGRAMS OFFERED

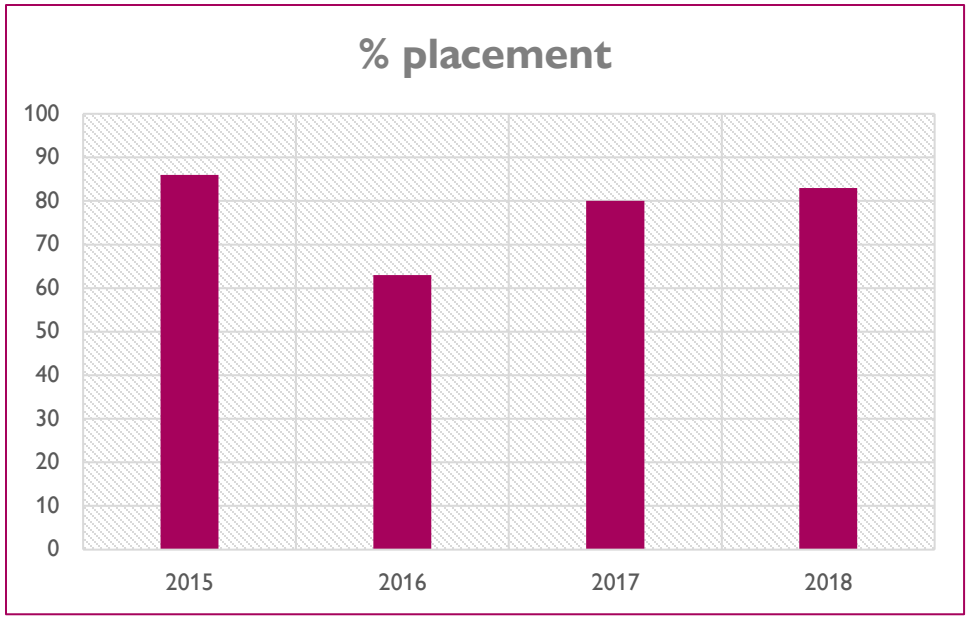
PROGRAM	INTAKE
B.TECH. IN COMPUTER SCIENCE AND ENGINEERING	90
B.TECH. IN ELECTRONICS & COMMUNICATION ENGINEERING	60
B.TECH. IN ELECTRICAL & ELECTRONICS ENGINEERING	60
B.TECH. IN MECHANICAL ENGINEERING	60
BACHELOR OF BUSINESS ADMINISTRATION (BBA)	40
BACHELOR OF COMPUTER APPLICATIONS (BCA)	40
Ph.D. PROGRAM	

LATERAL ENTRY INTO B.TECH. FOR DIPLOMA GRADUATES

PLACEMENT

Batch	2018-2022	2017-2021	2016-2020	2015-2019
% Placement	86	63	80	83
Highest CTC (LPA)	15.23	10.0	13.0	9.0
Average CTC (LPA)	5.38	5.05	4.73	4.41





RECRUITERS


SIGMOID


YELLOW
CLASS


YAMAHA


genpact


SKOLAR


TEACHNOOK
Education
Digital Platform
Analysis
Growth


ArisGlobal

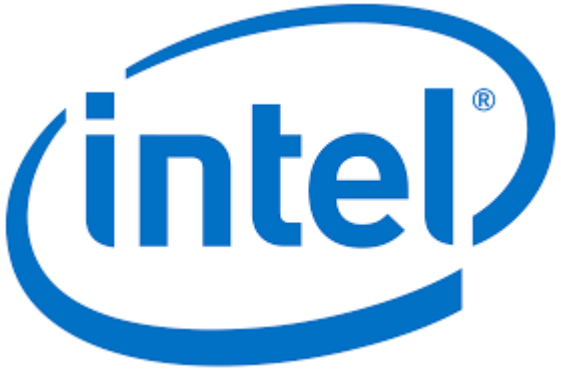

Incture


docquity


TATA
CONSULTANCY
SERVICES

RECRUITERS

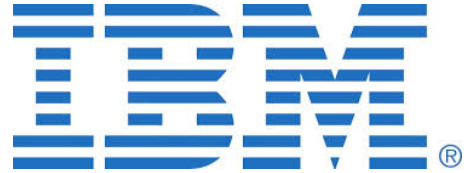

Microsoft


intel


ERICSSON


BYJU'S


EXIDE


IBM


wipro


Jio


vedanta

NOTABLE ALUMNI

Ms. Nupur Tiwary
Vice President at Credit Suisse
2007 batch

Mr. Sidharth Kumar
Deputy Commissioner,
Indian Revenue Service
2009 batch

Mr. Anshuman Tripathi
Asst. Commissioner,
GST, Customs and Narcotics
2010 batch

Mr. Aman Sharma Razdan
Co-Founder, Twimbit
Co-Founder & CTO, Atlancey
2015 batch

Dr. Romit Maulik
Asst. Computation Scientist
Argonne National Laboratory, Chicago
2008 batch

Mr. Ujjawal Sharma
Cyber Security Researcher
Carson & SAINT Corporation
2008 batch

Mr. Vipank Shree
Senior Software Engineer,
Microsoft
2010 batch

Ms. Pragya Kumari
Software Engineer,
Microsoft
2015 batch

Mr. Sujit Pandey
Senior Lead Engineer,
QUALCOMM
2012 batch

Mr. Amit Bhatt
Senior Application Development Analyst
IBM
2008 batch

Mr. Rishav Anand
MATLAB & Simulink Platform Engineer
Mathworks Inc.
2009 batch

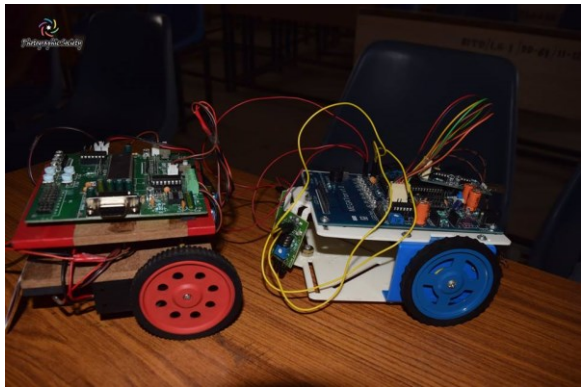
Mr. Prasenjit Thakur
Assistant Manager, SAMSUNG
MBA, IIM Ranchi
2010 batch

CULTURAL CLUBS & SOCIETIES

- SWAR – THE MUSIC CLUB
- NRITYA – THE DANCE CLUB
- ABHIVYAKTI – THE DRAMATIC SOCIETY
- LITERARY SOCIETY
- PHOTOGRAPHIC SOCIETY
- FINE ARTS SOCIETY

TECHNICAL CLUBS & SOCIETIES

- IEEE STUDENTS BRANCH
- ROBOTICS SOCIETY
- AUTOMOBILE SOCIETY
- CODING SOCIETY
- GEEKS FOR GEEKS STUDENT CHAPTER
- GOOGLE DEVELOPER STUDENT CLUB
- ENTREPRENEURSHIP DEVELOPMENT CELL



SPORTS ACTIVITIES

- Annual Athletics Meet
- Intercollege Sports Fests

INNOVATION ENTREPRENEURSHIP DEVELOPMENT ACTIVITIES

- Support new ideas through incubation and networking with other E-Cell and societies of the country
- Organize various events, seminar, workshops, short term courses and competitions promoting entrepreneurship interests among students BIT Deoghar and other colleges in the Santhal Pargana region of State as well.
- **Awarded 3.5 stars** in IIC by the Ministry of Education.
- The institute has been participating in the ARIIA ranking since 2019. The institute received **PROMISING** and **EXCELLENT** band in ARIIA, in the last two years.
- 100+ activities have been performed in the last five years, through the ED Cell.

START UP

- **INSTICONNET PRIVATE LIMITED**, a social media development platform, started by Vishal Kumar and Aditya Raj, 2022 graduated students of ECE department. The start-up has received a seed fund of Rs. 1.25 lakhs granted by honorable Vice Chancellor, BIT Mesra.

- **PHILOZOOIC**, a pet care platform, started by Mr. Rishabh Raj, Mr. Pushkar Upadhyay and Mr. Nitesh Anand, 2022 graduates of EEE department.

ACADEMIC DEPARTMENTS

- COMPUTER SCIENCE AND ENGINEERING
- ELECTRONICS & COMMNUCATION ENGINEERING
- ELECTRICAL & ELECTRONICS ENGINEERING
- MECHANICAL ENGINEERING
- PHYSICS
- CHEMISTRY
- MATHEMATICS
- HUMANITIES AND MANAGEMENT

COMPUTER SCIENCE & ENGINEERING

- The Department of Computer Science & Engineering was established with the inception of the college in the year 2007. At present Undergraduate and Ph.D. programs are offered by the department.
- The department has 3 spacious and well-designed laboratory, equipped with over 200-networked high-end desktop PCs with high-speed Internet connectivity.
- The Department has a niche flavor towards research and industrial implementation focusing Web based Auctioning, System Biology integration, Development of Recommender System, Hybrid intelligence in security, Software testing and Reliability analysis of software Applications, Internet of Things and Big data Analytics.

- **Courses:** (1) B.Tech. (2) BCA (3) Ph.D.
- **No. of laboratories:** 4
- **Sanctioned intake:** 90 (since 2020)
- **Number of faculty members:** 12

FACULTY MEMBERS

Anita Kushwaha
Ph.D. Pursuing
Assistant Professor
Area: Database, Soft Computing

Kamta Nath Mishra
Ph.D.
Assistant Professor &
In-Charge CSE
Area: Software Engineering, OS, Data Communication

Sounak Paul
Ph.D.
Assistant Professor
Area: Information Security, Software Engineering

Rayees Ahamad
Ph.D. Pursuing
Assistant Professor
Area: OS, AI, Linux

Arbind Kr. Choudhary
M.Tech.
Assistant Professor
Area: Object Oriented Design, Cloud Computing

Balaram Mandal
Ph.D. Pursuing
Assistant Professor
Area: Computer Network, DBMS

FACULTY MEMBERS

Raja Ram Dutta
Ph.D. Pursuing
Assistant Professor
Area: Cloud Computing, AI

Soumya Ray
Ph.D. Submitted
Assistant Professor
Area: Software Engineering, DBMS

Swapan Kr. Borat
MCA
Associate Lecturer
Area: Compiler Design, Automata

Saswata Mukherjee
MCA
Associate Lecturer
Area: Software Engineering, JAVA

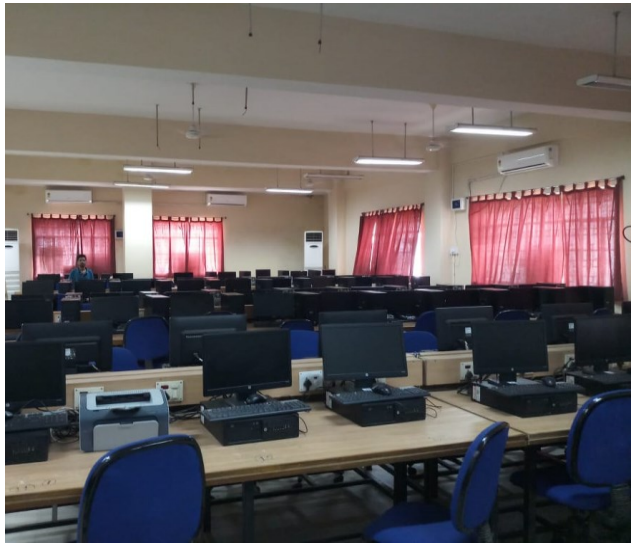
Nishi Kant Kumar
Ph.D.
Associate Lecturer
Area: DBMS, Software Project Management

Neena Jha
B.Tech.
Associate Lecturer
Area: UNIX & C, Data Structure

LABORATORIES

Name of Lab	No. of Computers
1. Computer Lab-1	60
2. Computer Lab-2	60
3. Computer Lab-3	60
4. Language Lab	40

Server Room



MAJOR SOFTWARES

1. Network Simulator
2. Visual Paradigm
3. Linux Online version
4. Online ORACLE

THRUST AREA OF THE DEPARTMENT

Distributed Computing

- Efficiency and transparency issues in cloud computing/edge computing
- Security in Cloud/fog/edge computing
- Reliability in distributed systems
- Issues of large-scale data processing in distributed systems
- Economics of Cloud computing.

RESEARCH ACTIVITIES IN THE DEPARTMENT

Blockchain-enabled portable device for Public Distribution Centres

Manash Sarkar, Anand Nayyar, **Nishikant Kumar Singh**

- A blockchain enabled portable device for Public Distribution Centre (PDC)
- This IoT enabled device works on wireless remote control, telecommunication equipment and radio amplifier . It is going to be helpful for physically challenged people.
- Applied for patent German Patent- DE file number- 20 2022 101 609.7

An Electronic device for physically challenged people

Manash Sarkar, Anand Nayyar, **Nishikant Kumar Singh**

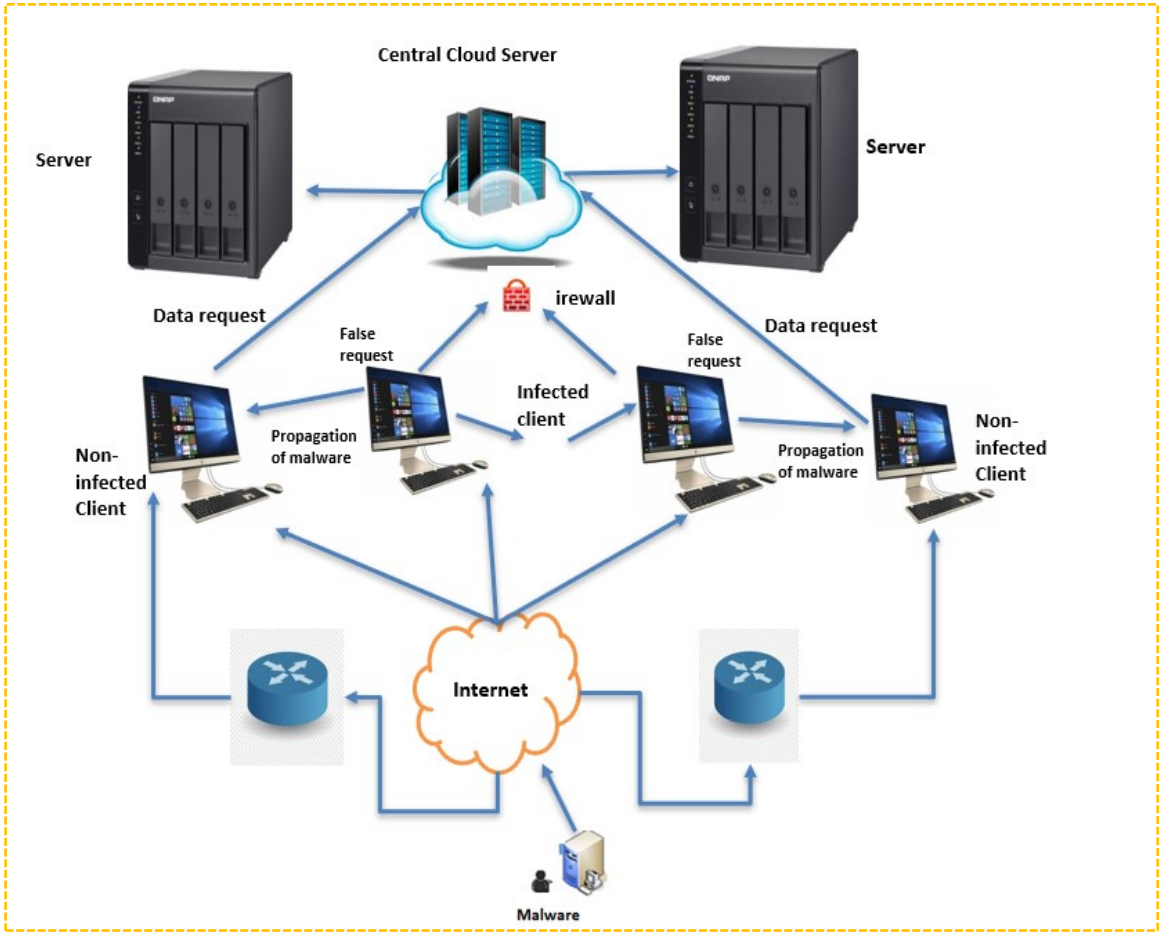
- This IoT enabled device works on wireless remote control, telecommunication equipment and radio amplifier . It is going to be helpful for physically challenged people.
- Applied for patent Indian Patent - Design Number: 357841-001

Design Model

DDoS Detection and Prevention of Attacks on M-Health Sensitive Data: A Novel Approach

Soumya Ray, Kamta Nath Mishra, Sandip Dutta

- The objective of the m-healthcare system is to transfer the sensitive patient runtime data through various digital devices like mobiles, laptops, smart phones, etc.
- The entire networking path is susceptible to different types of attacks, and one of the most vulnerable attacks is DDoS attack.
- The work mainly focuses on the DDoS attack recognition approach to easily identify the attack in the system.
- Design the deterrence methods to tackle the issues and analysed the significance of the approaches with the virtualized cloud-based simulator technique.



SPONSORED PROJECTS (APPLIED) IN LAST ONE YEAR

- Multiple Disease Infection Prediction in Smart Societies Using Intelligent Machine Learning Techniques of Rs 41.48 Lacs to ICMR. (PI: **Dr. Kamta Nath Mishra**; CO-PI: Dr. Rajesh Kr Lal).

- Hybrid Approach for Surveillance of Suspicious Objects Using UAV Images and Video Clips in Cloud-IoT Based Distributive Environment of Rs 48.00 Lacs to SERB. (PI: **Dr. Kamta Nath Mishra**; CO-PI: Dr. Rajesh Kr Lal).

PATENTS APPLIED

- Dr. Anand Nayyar, Dr. Manash Sarkar, Dr. Arup Roy, **Dr. Nishi Kant Kumar**, Electronic Device for Physically Challenged People, Application Number :357841-001, 2022 Country : India

- Manash Sarkar, Anand Nayyar, **Nishi Kant Kumar**, Arup Roy, Block chain Enabled Portable Device for Public Distribution Centres. Application Number : 20 2022 101-609.7 , 2022 , Country : Germany

PUBLICATIONS (LAST THREE YEARS)

Journal Papers

1. **Nishi Kant Kumar**, Soumya Banerjee, “Exploring Visual Analytics to Measure Reliability for IoT Oriented Pollution Detection Software Perspectives“, International Journal of Distributed Systems and Technologies (IJDST), pp. 1-19, 2019.
2. Soumya Ray, **Kamta Nath Mishra**, and S. Dutta, "Detection and Prevention of DDoS Attacks on M-healthcare Sensitive Data: A Novel Approach”, International Journal of Information Technology, pp. 1333-1341, 2022.
3. **Kamta Nath Mishra,** Vandana Bhattacharya, Shashwat Saket, and S.P. Mishra, “**Cloud and Big Data Security System’s Review Principles: A Decisive Investigation** “, Wireless Personal Communication, pp. 1-25, 2022.
4. Soumya Ray, **Kamta Nath Mishra**, S. Dutta, "Sensitive Data Identification and security assurance in cloud-IoT based systems", International Journal of Computer Network and Information Security, MECS Press Hong Kong, Manuscript Accepted, pp. 1 - 30, 2021
5. **Kamta Nath Mishra**, V. P. Mishra, Shashwat Saket, Shivam P. Mishra, “Hybrid Approach for Deception Tracing in Smart Cities Using LR and n-fold Intelligent Machine Learning Techniques”, International J. of Management & Practices, Inderscience, Vol. 16, No. 4, 460-287, 2022.
6. Soumya Ray, **Kamta Nath Mishra**, S. Dutta, "Susceptible data classification and security reassurance in cloud-IoT based computing environment", *Sadhana Journal of Engineering Science, Springer,* Manuscript Accepted, Vol. 46, pp. 1 - 24, 2021.
7. **Kamta Nath Mishra**, Subhash Chandra Pandey, "Fraud Detection and Prevention in Smart Cities Using k-fold Machine Learning Technique", *Wireless Personal Communication,* Springer, Vol. 116, pp. 1-25, 2021.
8. **Kamta Nath Mishra**, Ankur Raj, Arun Yugraj, Shivam Goel, "Integration of DNA databank with AADHAR database for tracing the parents of orphanage children and unclaimed Dead bodies", *International Journal of Cloud Computing,* Inderscience, pp. 1-24,2020.

PUBLICATIONS (LAST THREE YEARS)

9. **Kamta Nath Mishra**, "A novel integration of smart vehicles and secure clouds for supervising vehicle accidents on roads/ highways", *Sadhana Journal in Engineering Sciences,* Springer, Vol. 45, pp. 1-21, 2020.

10. **Kamta Nath Mishra** and Navin Kumar, "Multi-Server Multi -CS Based Deadlock Prevention in Distributed Systems Using Voting and Priority Based Approaches", *National Academy Science Letters,* Springer, Vol. 43, pp. 1-6. 2020.

11. Soumya Ray, **Kamta Nath Mishra**, Sandip Dutta, "Big Data Security Issues from the Perspective of IoT and Cloud Computing: A Review", *Recent Advances in Computer Science and Communications,* Benthem Science Journal, Vol. 13, pp. 1-25,2020.

12. **Kamta Nath Mishra**, "A Proficient Mechanism for Cloud Security Supervision in Distributed Environment", *International Journal of Computer Network & Information Security,* MECS-Press Hong Kong, Vol. 12, No. 6, pp. 57 - 77, 2020.

13. **Kamta Nath Mishra**, Ved Prakash Mishra, Shashwat Saket, Shivam P. Mishra, "Hybrid Approach for Deception Tracing in Smart Cities Using LR and n-fold Intelligent Machine Learning Techniques", International J. of Management & Practices, Enderscience, pp. 1-22, 2021.

14. **Kamta Nath Mishra,** Ved P. Mishra, Ankur Raj, Arun Yugraj, Shivam Goel, "Integration of DNA databank with AADHAR database for tracing the parents of orphanage children and unclaimed Dead bodies", *International Journal of Cloud Computing,* Inderscience, pp. 1-24,2020.

15. Abhishek Pandey, **Soumya Banerjee**, "Test suite optimization using firefly and genetic algorithm", International Journal of Software Science and Computational Intelligence, Vol. 11, No. 1, pp. 31-46, 2019.

16. Pratyay Manna,Mohammed Zafar Anis, Prasun Das, **Soumya Banerjee**, "Probabilistic Modeling of Flood Hazard and its Risk Assessment for Eastern Region of India, J. of Risk analysis, Vol. 39, No. 7, pp. 1615-1633, 2019.

17. S Bhattacharya, **S. Banerjee,** C. Chakraborty, "Iot-based smart transportation system under real-time environment", Big Data-Enabled Internet Things, Vol. 16, pp. 353-372, 2019.

PUBLICATIONS (LAST THREE YEARS)

Authored Research Books

1. **Kamta Nath Mishra** & Subhash Chandra Pandey, *"Cloud-IoT Technologies in Society 5.0",* De-Gruyter Germany, pp. 1 – 291, 2022 *(In Press)*.
2. **Kamta Nath Mishra** & Subhash Chandra Pandey, *"Cloud IoT-Based m-Health Systems for Vein Image Enhancement and Feature Extraction"*, IGI Global, pp. 1-246, 2020.

Conference Papers

1. **Kamta Nath Mishra,** "Tracing the Parents of Orphanage Children in Cloud and IoT Based Environment Using DNA-FIR-Aadhaar Databases", *IEEE International Conference on Emerging Trends in Information Technology and Engineering* (ic-etite2020), pp. 1-5, 2020.
2. **Kamta Nath Mishra**, "An Efficient Palatal patterns Based Methodology for Identity Verification of Identical twins", *sProc. of the EighthIntl. Conf. on Advances in Bio-Informatics, Bio-Technology and Environmental Engineering* -ABBE 2019, pp. 38-42, 2019.
3. A. Musthak, V. P. Mishra and **Kamta Nath Mishra,** "The New Phase of Manufacturing: Industry 4.0", *International Conference on Machine Intelligence and Data Science Applications (MIDAS-2020),* pp. 1-6, 2020.
4. V. P. Mishra, A. Shakeel, V. K. Shukla, and **Kamta Nath Mishra,** "Analysis of Computational Intelligence Techniques In Smart Cities", *International Conference on Machine Intelligence and Data Science Applications (MIDAS-2020),* pp. 1-6, 2020.

PUBLICATIONS (LAST THREE YEARS)

Book Chapters

1. **Nishi Kant Kumar** and Shashi Kant Kumar , "Predicting Diabetes using Machine Learning Approach: Review Report" for the upcoming Book Chapter titled as Applications of Artificial Intelligence & Machine Learning in Digital Rights & Multimedia Security", Springer Nature series. (Accepted), May 2022.

2. Shashwat Saket, S. P. Mishra, V. Bhattacharya, and **Kamta Nath Mishra, "**Travelling Guidance using ACO and HBMO techniques in COVID-19 Pandemics: A Novel Approach**",** Lecture Notes in the Network and Systems, pp. 1-14, 2022.

3. A. Shakeel, V. P. Mishra, Vinod Kumar Shukla, and **Kamta Nath Mishra.** Analysis of Computational Intelligence Techniques in Smart Cities, Springer Book on Machine Intelligence and Data Science Applications, Algorithms for Intelligent Systems, 35-53, 2021.

4. A. Musthak, V. P. Mishra and **Kamta Nath Mishra**, "The New Phase of Manufacturing: Industry 4.0", International Conference on Machine Intelligence and Data Science Applications (MIDAS-2020), pp. 97-110, 2021.

5. **Kamta Nath Mishra,** "An Efficient Palm-Dorsa-Based Approach for Vein Image Enhancement and Feature Extraction in Cloud Computing Environment", *Springer Book on Unmanned Aerial Vehicles in Smart Cities, Unmanned System Technologies,* pp. 1-22, 2020.

6. **Kamta Nath Mishra,** "An Efficient Approach towards Enhancing the Performance of m-Health Using Sensor Networks and Cloud Technologies", *Springer Book on the Internet of Things- Concepts and Applications,* pp. 1-22, 2020.

7. **Kamta Nath Mishra,** "Supervising Data Transmission Services Using Secure Cloud-Based Validation and Admittance Control Mechanism", *Springer Book on the Internet of Things – Concepts and Applications,* pp. 1-23. 2020.

8. **Kamta Nath Mishra,** Chinmay Chakraborty, "A Novel Approach Towards Using Big Data and IoT for Improving the Efficiency of m-Health Systems", *A Springer Book on Advanced Computational Intelligence Techniques for Virtual Reality in Healthcare,* pp. 123-139, 2020.

9. **Kamta Nath Mishra,** Chinmay Chakraborty, "A Novel Approach Towards Enhancing the Quality of Life in Smart Cities using Clouds and IoT Based Technologies", *A Book on Digital Twins Technologies and Smart Cities, Springer,* pp. 19-35, 2020.

ACHIEVEMENTS OF CSE STUDENTS

- **Mr. Aman Sharm** (2015 batch alumni of CSE branch) has started a Startup company in Noida and the company is successfully doing business for the last three years.

- **Mr. I. Navin Kumar** (2016 batch alumni of CSE branch) has joined M.Tech. (Robotics Computing) in MO-2022 at Indian Institute of Science (IISc), Bangaluru.

- **Ms. Chandrika Deb** (2016 batch alumni of CSE branch) has joined MBA programme in MO-2022 at Indian Institute of Management (IIM), Rohtak.

- **Ms. Tanya Ambasht** (2012 batch alumni of CSE branch) passed Indian Civil Service Examination in 2020 with All India Rank 237.

ELECTRONICS & COMMUNICATION ENGINEERING

- The department was established at the inception of the college in the year 2007 and is presently offering Undergraduate and Ph.D. programs.
- The department has well-equipped laboratories imparting exposure to students in both hands-on skill enhancement and developing technologies through virtual laboratory simulation.
- The Department has modern research facilities in major areas of Electronics and Communication such as EMI/EMC, Computational Electromagnetics, Printed RF and Microwave Circuits, Wearable Microstrip Antenna, Wireless Communication, Wireless Networking.

- **Courses:** (1) B.Tech. (2) Ph.D.
- **No. of Laboratories:** 6
- **Sanctioned intake:** 60
- **Number of faculty members:** 10

FACULTY MEMBERS

Rajesh Kumar Lal
Ph.D.
Associate Professor &
In-Charge ECE
Area: Optoelectronics & Semiconductor Device Modeling

Mainak Mukhopadhyay
Ph.D.
Associate Professor
Area: Adaptive Signal Processing and MIMO system

Chinmay Chakaraborty
Ph.D.
Assistant Professor
Area: Wireless communication, IOT in Healthcare

Vikash Sharma
M.E.
Assistant Professor
Area: Communication system

FACULTY MEMBERS

Akhilesh Kr. Roy
Ph.D. Pursuing
Assistant Professor
Area: Microelectronics, VLSI Design

Sutapa Mondal
Ph.D. Pursuing
Assistant Professor
Area: Wireless Communication

Sridhar Chintala
Ph.D. Pursuing
Assistant Professor
Area: Analog VLSI, Semiconductor devices

Akash Kr. Gupta
Ph.D. Pursuing
Assistant Professor
Area: DSP, Wireless Communication

Payal Bhardwaj
Ph.D. Pursuing
Assistant Professor
Area: Semiconductor Devices, Antenna

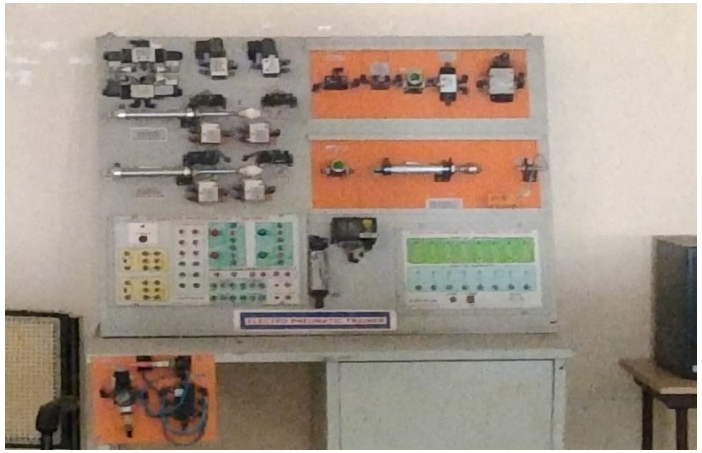
Mahendra Kr. Das
Ph.D. Pursuing
Associate Lecturer
Area: Optoelectronic Devices, Instrumentation

LABORATORIES

1. Electronics Engineering Lab
2. Electronics Simulation Lab
3. Instrumentation Lab
4. Microwave Lab
5. Communication Labs
6. Fiber Optics Lab

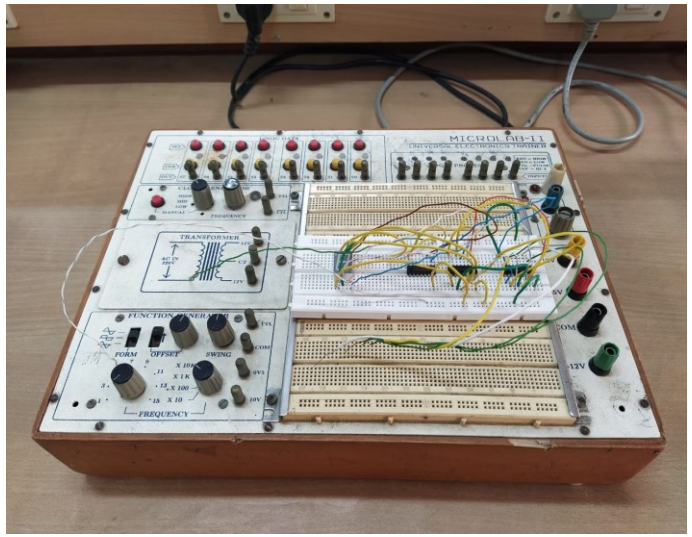
A SDK-85 from Microprocessor Lab

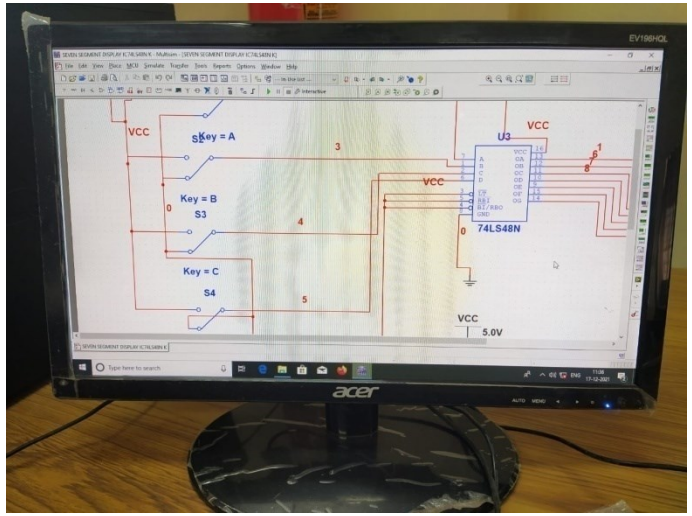
Instrumentation Lab kits

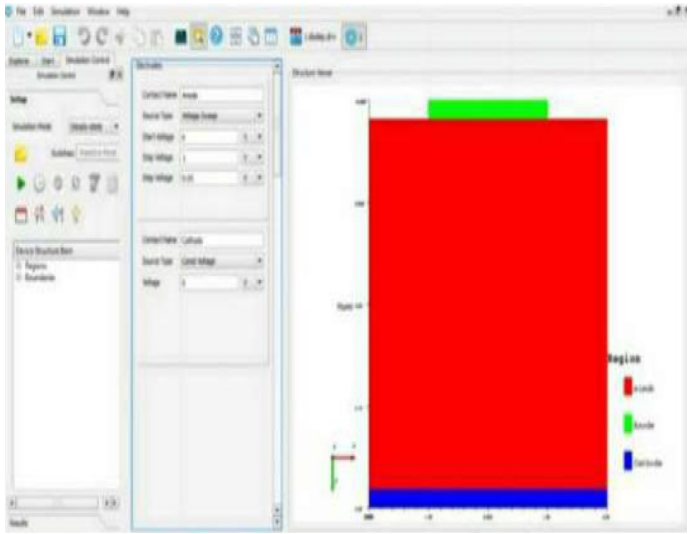


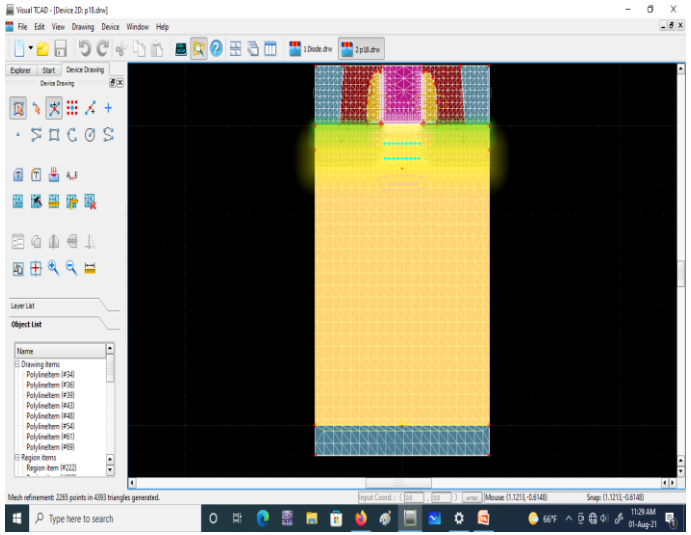
Communication Laboratory

Microwave Laboratory

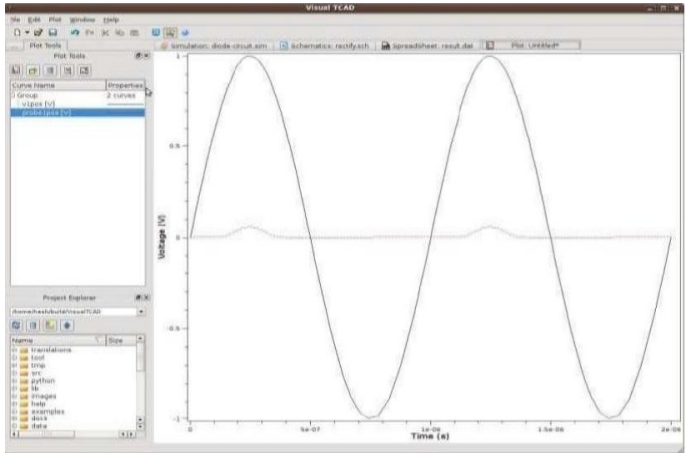








Electronics laboratory kit and
Glimpse of Simulation Softwares like
Labview, Cadence, Multisim etc.



THRUST AREA OF THE DEPARTMENT

MIMO & Big Data Analysis

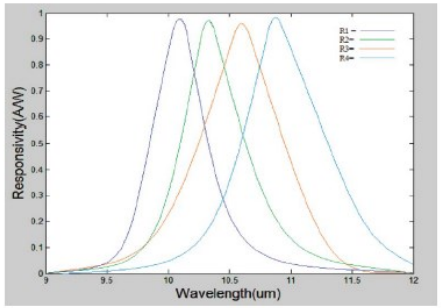
- Multi-Antenna Systems
- Multi-User Signal Processing with Big Data & Sparse Signal Processing
- Spectrum and Energy Efficient Communications
- Machine Learning for Wireless Communications and Big Data analysis
- Homomorphic Encryption

RESEARCH ACTIVITIES IN THE DEPARTMENT

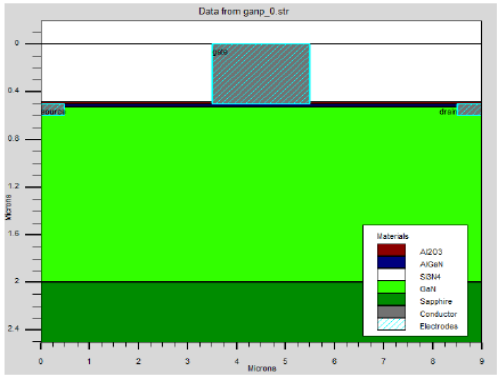
R K Lal currently working on modeling of optoelectronic Devices mainly infrared Photodetector. In this field he has modeled some III-V material based infrared detectors for the detection of toxic gas monitoring.

The developed photodetectors are able to work in LWIR as well as MWIR. He also work for the long wavelength region non-telecommunication application using Quantum Well infrared photodetectors.

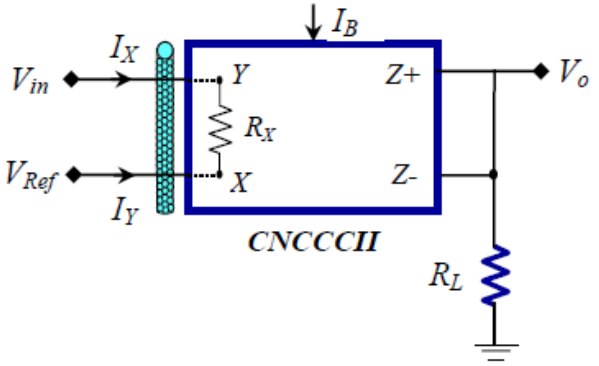
Dr. Lal also worked in area of Physical domain VLSI designing with his research scholar Atul Prakash. In this they optimizes wavelength and area and reduces dead space. He now planning to develop some high frequency THz trans-receivers for wireless.



Responsivity vs. wavelength at different well width and mole fraction IETE Journal of Research, 2017



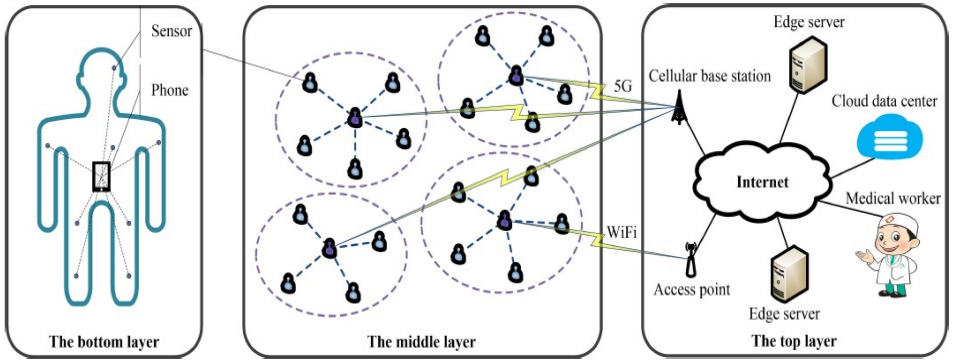
Proposed structure of MODFET for polarization analysis , IJAST, 2020

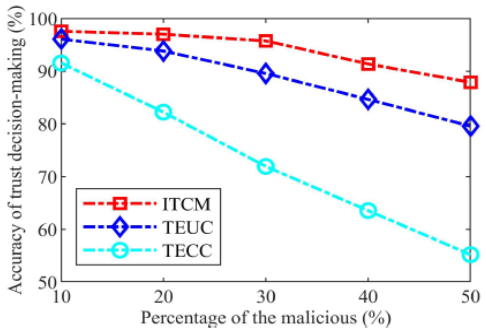


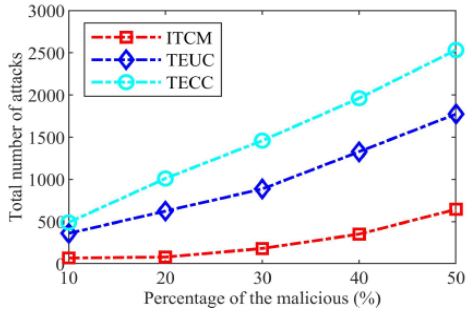
Proposed comparator using CNCCCII Micro and Nanosystems, 2020

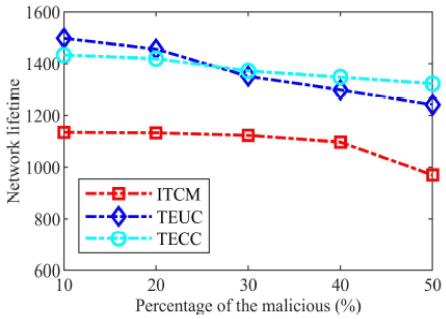
Chinmay Chakraborty currently working on Internet of Medical Things (IoMT), 5G Edge Computing, Device-to-device (D2D) Communication, Trust Cloud and Security.

The objective of his research - To assure secure and reliable communication in 5G edge computing and D2D enabled IoMT systems using intelligent trust cloud management method.

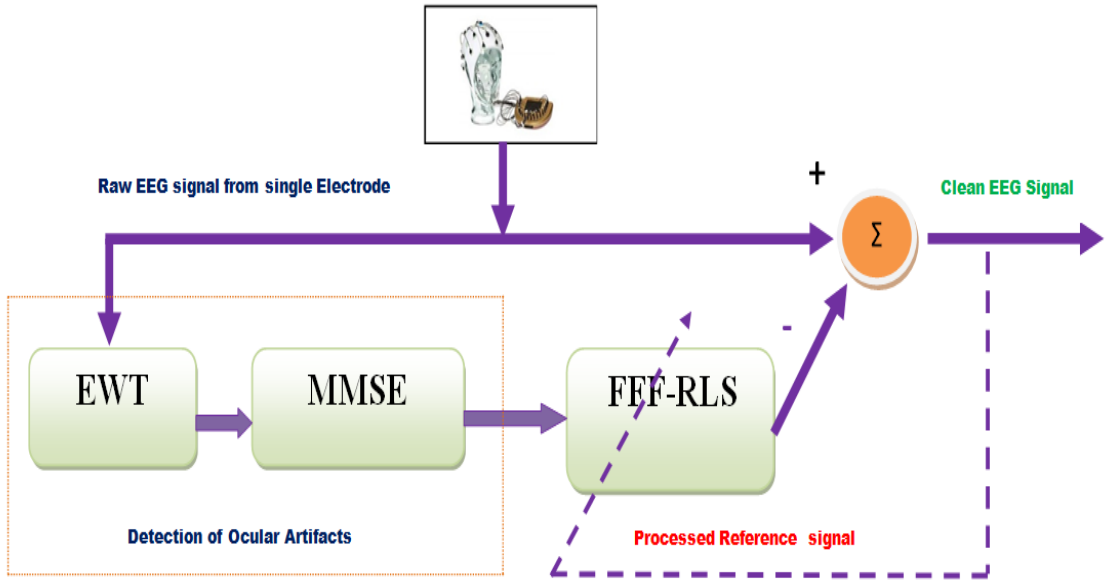








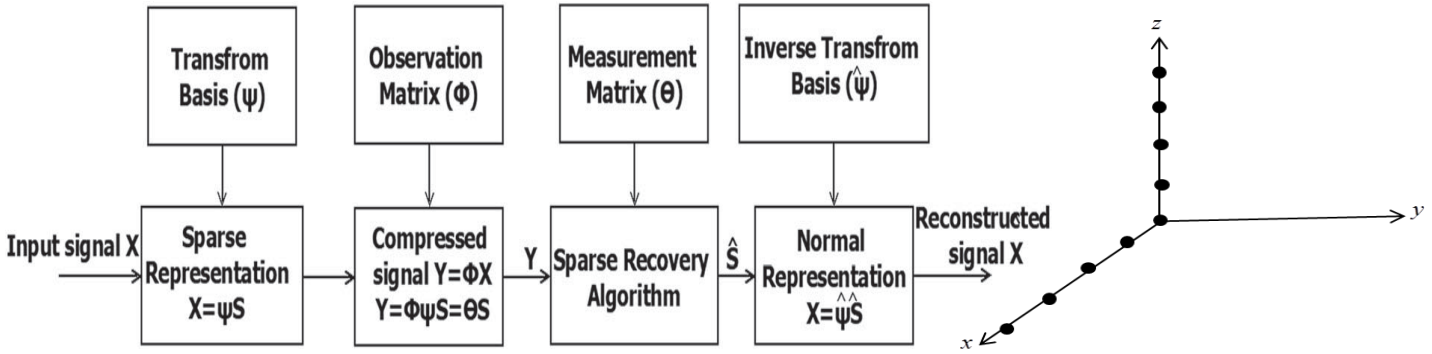
Sridhar Chintala currently working on excision of different artifacts from the EEG signals for biomedical applications. The objective of his research is that to eliminate the unwanted artifacts like eye blinks from recorded underlying brain signals using different statistical signal processing methods. Moreover, he also working on classification methods for lie detection applications using brain signals.



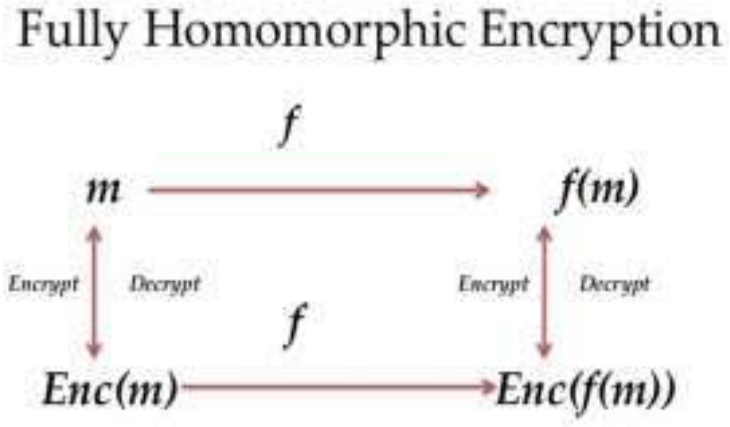
Mainak Mukhopadhyay currently working on Co-prime array (Sparse array) signal processing and on Fully Homomorphic Encryption.

•An adequately designed Sparse array can achieve Direction of Arrival estimation of signals and mitigate jammers with much fewer array elements than a Smart Antenna.

•Homomorphic Encryption, when fully developed, will make provision for an unlimited number of mathematical operations on encrypted data and get the output as if the operation would have been conducted on the actual data without compromising the data security or encryption.



Sparse Signal Processing and structure of an L-shaped sparse array



SPONSORED PROJECTS (COMPLETED)

Augmentation of Jamming Resistance Global Positioning System for Space Borne Application using Smart Antenna of Rs. 9.6 Lacs, DST , GoI.

PI: Dr. Mainak Mukhopadhyay

Duration 2012 -15.

SPONSORED PROJECTS (APPLIED) IN LAST ONE YEAR

- Development of guided weapons' anti jam techniques using V-shaped Smart Antenna & satellite image reconstruction with compressive sensing using L-shaped sparse array antenna of Rs. 35.1 Lacs to SERB. (PI: **Mainak Mukhopadhyay**)

- Direction of Arrival and localization system for Search and Rescue Applications of Rs. 10.67 Lacs to ISRO RESPOND (PI: **Mainak Mukhopadhyay**)

- RFIC for Wideband Microwave Receiver Analog Front End of Rs. 15.96 Lacs without fabrication cost of RFIC to ISRO RESPOND (PI: **Mainak Mukhopadhyay**, Co-PI: **Sridhar Chintala**)

- Development of Adaptive Sparse Array Antenna based on Compressed Sensing to Reduce the Payload in Satellite and Anti-Jamming techniques for IRNSS using Smart Antenna of Rs. 15.53 Lacs to SAC NAVIC GAGAN Phase-II of ISRO (PI: **Mainak Mukhopadhyay**, Co-PI: **Sridhar Chintala**)

- Multiple Disease Infection Prediction in Smart Societies Using Intelligent Machine Learning Techniques of Rs 41.48 Lacs to ICMR. (PI: Kamta Nath Mishra; Co-PI: **Rajesh Kr Lal**)

- Hybrid Approach for Surveillance of Suspicious Objects Using UAV Images and Video Clips in Cloud-IoT Based Distributive Environment of Rs 48.00 Lacs to SERB. (PI: Kamta Nath Mishra; Co-PI: **Rajesh Kr Lal**).

PATENTS APPLIED

- Garg, Lalit; Chukwu, Emeka; Nasser, Nidal; **Chakraborty, Chinmay**; Garg, Gaurav, An integrated secure covide-19 contact tracing framework using IoT platform with blockchain, Australian patent, 2020102965 (Australian patent), 22 Oct. 2020

- Neha S, Durgesh S, **Chinmay C**, Deepak S, Ritu T, Ishpreet SV, Sunil KM, Khyati M, Intelligent street and parking light monitoring through AI, IPR, Application Number - 202111058518, 14th Jan. 2022 (Indian patent)

PUBLICATIONS

Journal Papers

1. Pulak Mazumder, Soumyadeep Chandra, Sekhar Rana, **Mainak Mukhopadhyay** & Mrinal Kanti Naskar "*Parallel Hardware Implementation of Walsh Hadamard Transform* " JSIR Vol.81(03), July 2022.

2. Ganguly, S., Ghosh, J., Kumar, P.K., **Mukhopadhyay M**. "An Efficient DOA Estimation and Jammer Mitigation Method by Means of a Single Snapshot Compressive Sensing Based Sparse Coprime Array." Wireless Personal Communications, 2021.

3. Singh, Brijesh Kumar; **Mukhopadhyay, Mainak**; "*Energy Detector Based Spectrum Sensing Performance Analysis over Fading Environment*", JSIR Vol.80 (03), page 239-244, 2021.

4. Ganguly, Saurav; Ghosh, Jayanta; Kumar, Puli Kishore; **Mukhopadhyay, Mainak**, "*An Efficient Source Localization Method in Presence of Multipath using Smart Antenna System*", JSIR Vol.79(12), page 1069-1073, December 2020.

5. Sarkar, Indranil; **Mukhopadhyay, Mainak;** Maity, Tanmoy, "*A New Blind DOA Estimation Using Two Uniform Linear Array for Low Side Lobe Adaptive Array*", JSIR Vol.79(04), page 312-314, 2020.

6. Brijesh Kumar Singh & **Mainak Mukhopadhyay** ; "*Unified performance analysis over Mckay–Meijer G shadowed fading channel*", International Journal of Electronics, Taylor & Francis, 2020.

7. Saurav Ganguly, Jayanta Ghosh, Kankanala Srinivas, Puli Kishore Kumar, **Mainak Mukhopadhyay**, "*Compressive Sensing Based Two-Dimensional DOA Estimation Using L-Shaped Array in a Hostile Environment*", Traitement du Signal Vol. 36, No. 6, pp. 529-538, 2019.

8. S Maharatha & **M Mukhopadhyay**, "*A New Digital Modulation Technique: Two Messages in One Carrier*", Journal of Scientific & Industrial Research, Vol. 78, pp.589-595, 2019.

9. Rachna Kumari, **Mainak Mukhopadhyay**, "*Design of GPS antijamming algorithm using adaptive array antenna to mitigate the noise and interference",* Journal of Ambient Intelligence and Humanized Computing, Vol 10, No.3, ISSN 1868-5137, February 2019.

PUBLICATIONS

10. L. Yang, K. Yu, S. X. Yang, **Chinmay C.**, Y. Liu, and T. Guo, An Intelligent Trust Cloud Management Method for Secure Clustering in 5G enabled Internet of Medical Things, IEEE Transactions on Industrial Informatics, 2021.

11. Anichur R, **Chinmay C.**, Adnan A, Md. R, Md. JI, Dipanjali K, Ziaur R, Shahab SB, SDN-IoT Empowered Intelligent Framework for Industry 4.0 Applications during COVID-19 Pandemic, Cluster Computing, 2021.

12. Hemanta KB, **Chinmay C.**, Yogesh S, Suvendu KP, COVID-19 Diagnosis System by Deep Learning Approaches, Expert Systems, 1-12, 2021.

13. Jianwei L, Hongli L, **Chinmay C**, Keping Y, Xun S, Ziji M, Cascade Learning Embedded Vision Inspection of Rail Fastener by Using a Fault Detection IoT Vehicle, IEEE Internet of Things Journal, 2021.

14. Vasundhara A, Vinayakumar R, Pham TD, **Chinmay C**, Peripheral Blood Smear Analysis using Automated Computer Aided Diagnosis System to Identify Acute Myeloid Leukemia, IEEE Transaction on Engineering Management, 2021.

15. Amit K., **Chinmay C.**, Artificial Intelligence and Internet of Things based Healthcare 4.0 Monitoring System, Wireless Personal Communications, 1-14, 2021.

16. Gupta A, **Chinmay C.**, Gupta B, Secure transmission of EEG data using watermarking algorithm for the detection of epileptical seizures, Traitement du Signal, IIETA, 38(2), 473-79, 2021.

17. Usman RK, Ubaid U, Shehzad K., Umar R, **Chinmay C**, Fadi AT, Path Loss Modelling at 60 GHz mmWave Based on Cognitive 3D Ray Tracing Algorithm in 5G", Peer-to-Peer Networking and Applications, 1-17, 2021.

18. Amit K., **Chinmay C.**, Wilson J., A Novel Fog Computing Approach for Minimization of Latency in Healthcare using Machine Learning, International Journal of Interactive Multimedia and Artificial Intelligence, 1-11, 2021

19. Chinmay C., Joel JPC Rodrigues, A Comprehensive Review on Device-to-Device Communication Paradigm: Trends, Challenges and Applications, Springer: Int. Journal of Wireless Personal Communications, 114, 185-207, 2020.

PUBLICATIONS

20. Rajkumar R, Dileepan D, **Chinmay C**, Suresh P, Modified Minkowski Fractal Multiband Antenna with Circular-Shaped Split-Ring Resonator for Wireless Applications, Elsevier - Journal of the International Measurement Confederation, 182, 1-9, 2021.

21. Sunil KM, Manju K, **Chinmay C.**, Deepak S, Durgesh S., Performance Evaluation of AODV and DSR Protocols of Flying Ad-hoc Network using Highway Mobility Model, J. of Circuits, Systems, and Computers, 1-31, 31(1) 2021.

22. Vinayakumar R., Harini N, **Chinmay C**, Tuan D. P, Deep learning based Meta-classifier Approach for COVID-19 Classification using CT scan and Chest X-ray Images, Multimedia Systems, 1-15, 2021

23. Revathi M, Suresh P, **Chinmay C**, Saravana KU, Improved Performance on Seizure Detection in an Automated Electroencephalogram Signal under Evolution by Extracting Entropy Feature, Springer Multimedia Tools and Appl, 2021.

24. Mohd M.A., Mohammad ZK., Mohd AA, Abdulfattah N, Danish RR, **Chinmay C**, Distributed ledger Technology based Robust Access and Real-time Synchronization for Consumer Electronics, PeerJ Computer Science, 7:e566, 2021.

25. Bakhtawar A, Abdul RJ, **Chinmay C.**, Jamel N, Saira R, Muhammad R, Blockchain and ANFIS empowered IoMT Application for Privacy Preserved Contact Tracing in COVID-19 Pandemic, Personal and Ubiquitous Computing, 1-17, 2021.

26. Amit K, **Chinmay C**, Wilson J, Reinforcement Learning for Medical Information Processing over Heterogeneous Networks, Springer Multimedia Tools and Appl, 1-22, 2021.

27. Dwivedi R, Dey S, **Chinmay C**, Tiwari S, Grape Disease Detection Network based on Multi-task Learning and Attention Features, IEEE Sensors Journal, 1-8, 2021.

28. Ajay K, Kumar A., Bharat B., **Chinmay C**, Secure Access Control for Manufacturing Sector with Application of Ethereum Blockchain, Peer-to-Peer Networking and Applications, 1-17, 2021

29. Usman RK, Ubaid U, Shehzad K., Umar R, **Chinmay C**, Fadi AT, Path Loss Modelling at 60 GHz mmWave Based on Cognitive 3D Ray Tracing Algorithm in 5G", Peer-to-Peer Networking and Applications, 1-17, 2021.

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30. Amit K., **Chinmay C.**, Wilson J., A Novel Fog Computing Approach for Minimization of Latency in Healthcare using Machine Learning, International Journal of Interactive Multimedia and Artificial Intelligence, 1-11, 2020.

31. Chinmay C., Joel JPC Rodrigues, A Comprehensive Review on Device-to-Device Communication Paradigm: Trends, Challenges and Applications, Springer: Int. Journal of Wireless Personal Communications, 114, 185-207, 2020.

32. Akash KG, **Chinmay C**, Bharat G, Secure transmission of EEG data using watermarking algorithm for the detection of epileptical seizures. Traitement du Signal, IIETA, 38(2), p.473-479, 2021.

33. Prakash, A., **Lal, R.K.**, Floor planning for Area Optimization Using Parallel Particle Swarm Optimization and Sequence Pair. Wireless Pers Commun, 2021.

34. Akash KG, **Chinmay C**, Bharat G, Secure transmission of EEG data using watermarking algorithm for the detection of epileptical seizures. Traitement du Signal, IIETA, 38(2), p.473-479, 2021.

35. Chintala, S., Thangaraj, J. and Edla, D.R., Elimination of EOG signals from raw EEG signals using step size based recursive least squares-least mean fourth adaptive algorithm. Applied Acoustics, 180, p.108097, 2021

36. Chintala, S., Thangaraj, J. and Edla, D.R., Mixed step size normalized least mean fourth adaptive algorithm for artifact elimination from raw EEG signals. Biomedical Signal Processing and Control, 65, p.102392, 2021.

37. Prakash, A., **Lal, R.K.,** Floorplanning for Area Optimization Using Parallel Particle Swarm Optimization and Sequence Pair. Wireless Pers Commun, 2021

AWARD / RECOGNITION (FACULTY)

- Dr. Chinmay Chakraborty, Best Session Runner-up Award, for "Artificial Intelligence for Smart Healthcare“, Congress on Intelligent Systems (CIS2020) , Chennai, 2020.
- Dr. Chinmay Chakraborty, Best Researcher Award, 7th Int. Scientist Awards on Engineering, Science, and Medicine, International Level, 2020.

ACHIEVEMENTS OF ECE STUDENTS

1. Ms. Pratyasha Kumar, ECE (BTECH/60096/20), Ms. Satrupa Deb, CSE, (BTECH/60115/20), Mr. Ravi Kant Jha, ECE, (BTECH/60097/20), Mr. Abhinav Kumar, CSE, (BTECH/60137/20), got Second Prize (Rs. 75,000.00 + Certificates + Revenue) for the game developed by the team, in Covid Gameathon'21, organized by AngelHack in association with HEART Hyderabad and St. Fransis College for Women Hyderabad, through a grant from the U.S. Consulate General Hyderabad.

2. Vishal Kumar BTECH/60069/18 and Aditya Raj BTECH/60068/18, started Social Media Platform Development named "INSTICONNECT PRIVATE LIMITED", by Self and the Seed Fund granted from BIT Mesra by the Honorable, Vice Chancellor, BIT Mesra, who Provided seed money of Rs. 1.25 Lakhs as a pre-incubation financial support.

ELECTRICAL & ELECTRONICS ENGINEERING

- The program has been designed to provide students with a strong foundation, in theory as well as practical, so as to equip them with skills necessary to grasp and develop new technologies.
- The faculty members are devoted to maintaining a high quality of teaching and always encourage innovative research.
- The Department is dedicated to the current needs of the industry with the flexibility to tune its program according to different requirements.
- The Department has modern research facilities in major areas of Power System, Control & Automation, Power Electronics and Electric Machine Design.

- **Offered Course:** (1) B.Tech. (2) Ph.D.
- **Number of Laboratories:** 8
- **Sanctioned Intake:** 60
- **Number of faculty members:** 8

FACULTY MEMBERS

R. C. Jha
Ph.D.
Professor & Director
Area: Power System

Deep Shekhar Acharya
Ph.D.
Assistant Professor &
In-Charge EEE
Area: Fractional Order PID Controller, Optimization Algorithms and their applications.

Piyush Kumar Ojha
Ph.D.
Assistant Professor
Area: Power System and Power Electronics

Md. Junaid Akhtar
Ph.D.
Assistant Professor
Area: Electrical Machine Design, Power Electronics & Drives

FACULTY MEMBERS

Srihari Gude
Ph.D. Pursuing
Assistant Professor
Area: Parameter estimation of PV Cell, Nonlinear Controller and Optimization.

Prabhat Kumar Ranjan
Ph.D. Pursuing
Assistant Professor
Area: Power Electronics & Power System.

Nilesh Kumar Rajalwal
Ph.D. Pursuing
Assistant Professor
Area: Integrity protection scheme of power system.

Surendra Kumar Mahto
Ph.D. Pursuing
Associate Lecturer
Area: Demand Side Management.

LABORATORIES

1. Basic Electrical Engineering Lab
2. Electrical Machines Lab
3. Power Systems Lab
4. Control Systems Lab
5. Power Electronics Lab
6. Electrical Workshop
7. Electrical Measurement and Instrumentation lab
8. Simulation Lab

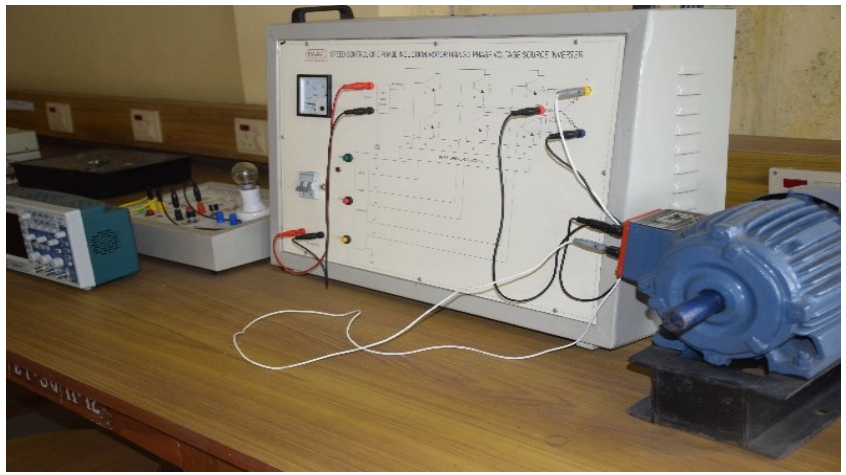
Measurement & Instrumentation Lab

LABORATORIES

Electrical Machine Lab

Power System Lab

LABORATORIES



Power Electronics Lab

Control Systems Lab

Simulation Lab

Major Laboratory Equipments

1. Parallel Operation of alternators
2. Air Circuit Breaker
3. dSPACE
3. Quanser Magnetic Levitation

Softwares

1. PSCAD
2. ETAP
3. PSIM
4. Power World Simulator
5. LabVIEW
6. MATLAB

THRUST AREA OF THE DEPARTMENT

Optimization and Control of Modern Power Systems

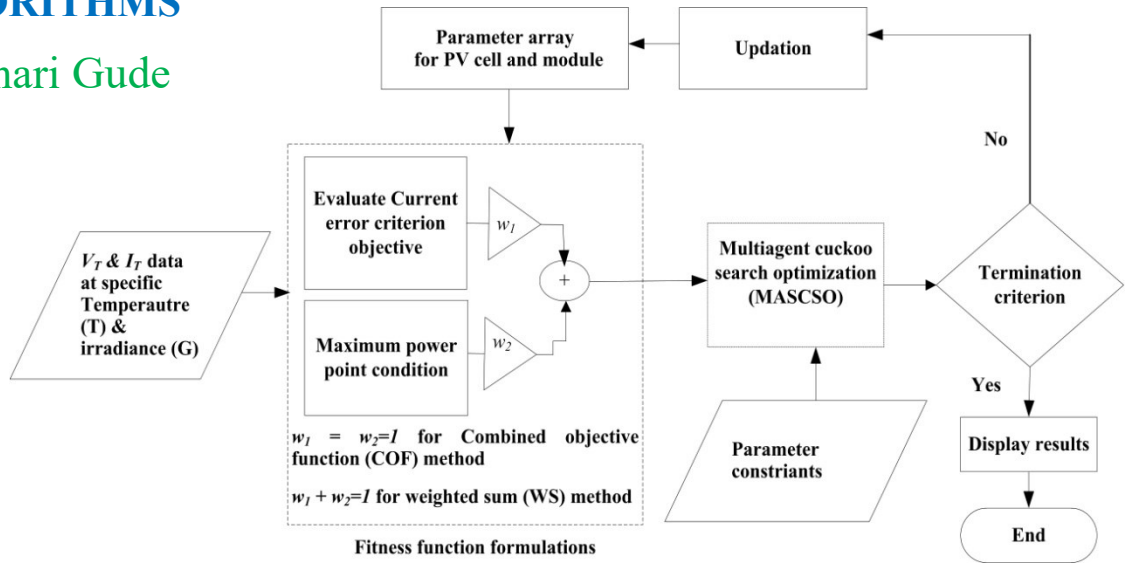
- Improve voltage and frequency stability.
- Generate optimal power sources and participate in the energy market.
- Provide uninterrupted power supply to critical loads like the hospital, school, and traction drive, etc.
- Enhancing the monitoring cost of energy production and power transfer capability of the microgrid.
- Capable to provide better energy management by appropriately tracking the grid and load demand.

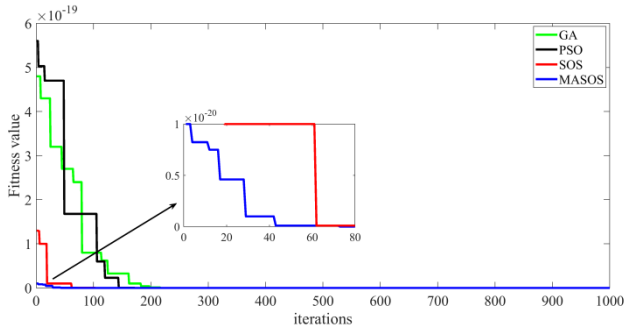
RESEARCH ACTIVITIES IN THE DEPARTMENT

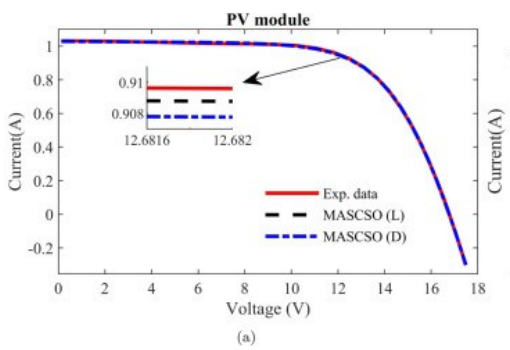
FORMULATION OF MULTI-AGENT BASED OPTIMIZATION ALGORITHMS

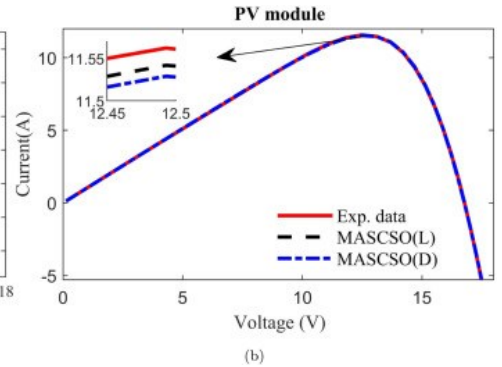
D. S. Acharya and Srihari Gude

- Exploration process is modified, by incorporating the cooperation strategy of multi-agent based systems.
- The performance of the proposed algorithm is compared with the existing stat-of-the-art using statistical tools.
- The algorithms have been used for parameter estimation of PV cell and tuning of PID and fractional order PID controller.
- These algorithms find application in various fields where optimization is necessary. We are presently working on multi-objective algorithms.





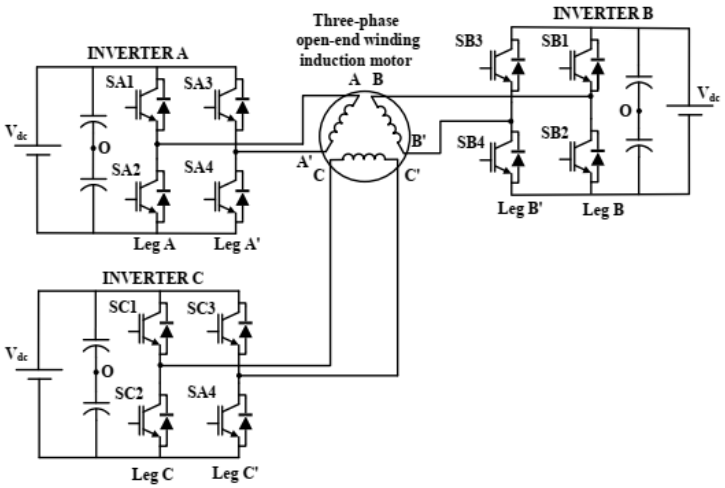




Space Vector Modulation for Distributed Inverter Fed Induction Motor Drive

Md. Junaid Akhtar

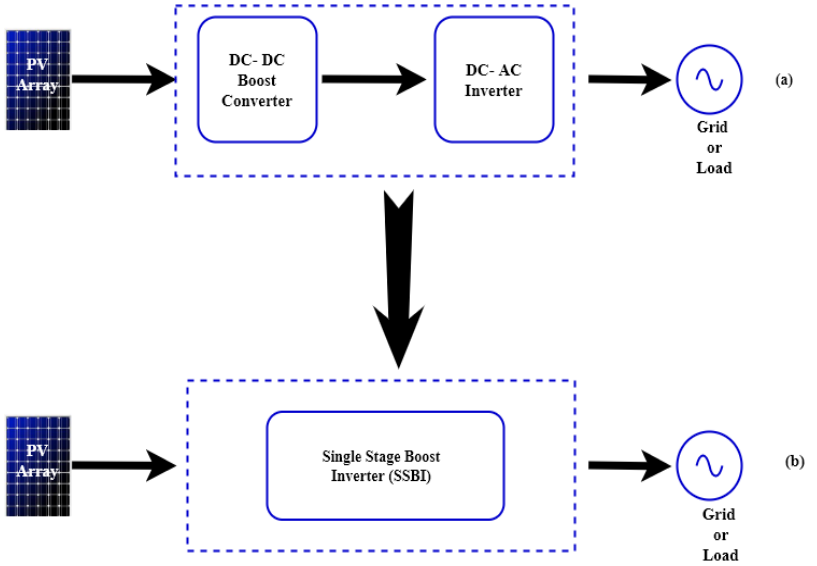
- Open-end winding induction motor is used, and each phase is excited by single-phase H-bridge inverter.
- Space Vector Modulation technique is implemented such that common-mode voltage and zero-sequence voltage are reduced.

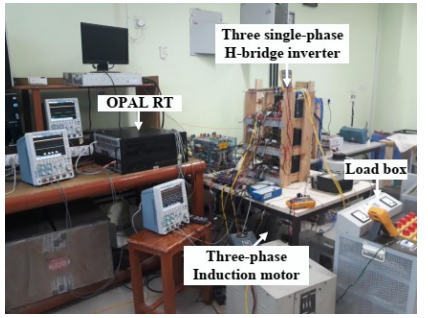


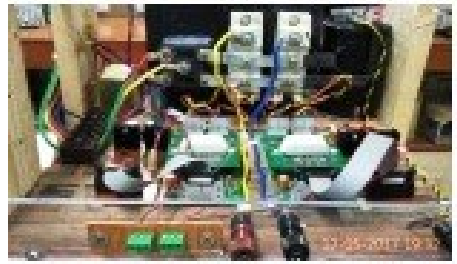
Solar PV Grid Integration, Modeling and Predictive Control of Single-Stage Boost Inverter for Solar PV Applications

P. K. Ojha and P. K. Ranjan

- Design and develop a cost-effective and reliable solar PV converter unit for electric grid integration which contributes, environmental concerns, and ecological deterioration.
- Model Predictive Control approach, future value of voltage and current is predicted for all variable vectors and selection of proper switching states occurs through suitable cost function minimization





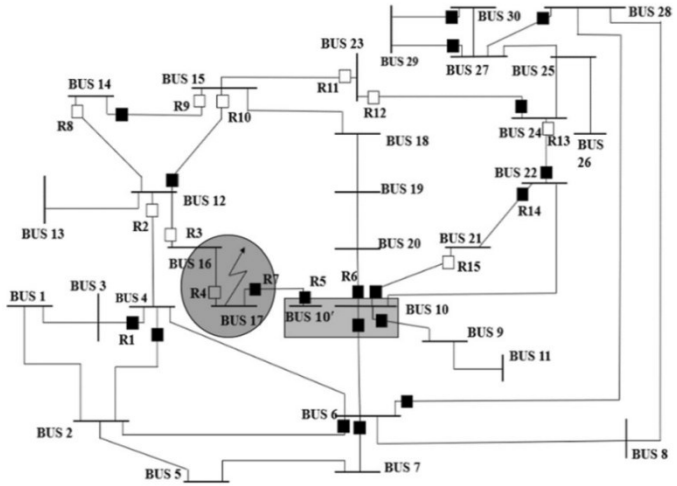


Single-phase H- bridge Inverter

Adaptive relay co-ordination for Integrity Protection Scheme

N. K. Rajalwal

- Busbar splitting eliminates the dependency upon minimum breakpoints set and reduces the relay operating time, thus making it adaptive.
- The modeling and simulation carried out in ETAP for IEEE 30 bus system.
- The proposed adaptive relay co-ordination scheme is mainly focused on reducing the operating time of the relays based on the busbar splitting scheme applicable for SIPS.



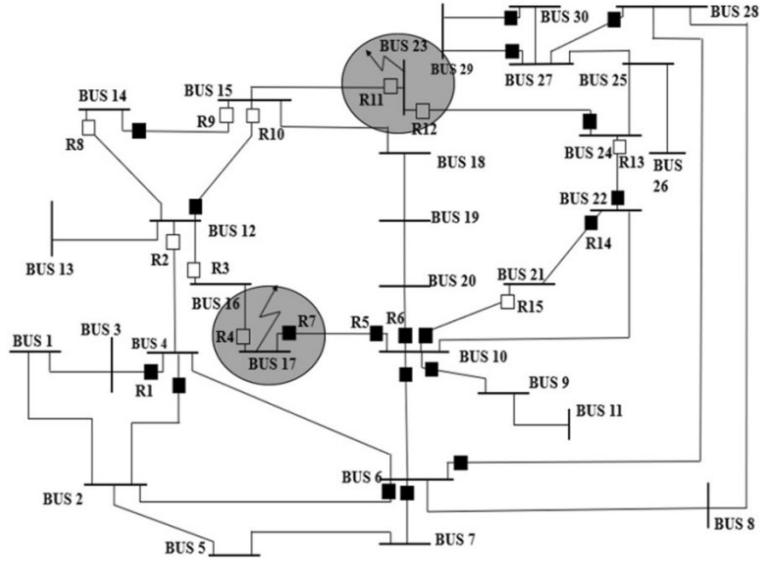
IEEE 30-bus system under single fault

Adaptive relay co-ordination using busbar splitting approach for Integrity Protection Scheme

N. K. Rajalwal

- A busbar splitting approach may be utilized for adaptive relay setting and coordination purposes for a system integrity protection scheme (SIPS).

- During the faulty condition, the busbar splitting scheme splits a bus to convert a loop into a radial structure. The splitting schemes are chosen such that the net fault current is also reduced.



IEEE 30-bus system under multiple fault locations

PEDELEC (EPAC)

Develop by:
Mr. Shikhar Kumar, Mr. Archit Kumar & Mr. Raju Dubey

Under the guidance of Mr. Srihari Gude

- A low-powered electric bicycle where the rider's pedaling is assisted by a small electric motor.
- Presently, work is in progress for designing a solar PV supported battery charger for the Pedelec.

Battery

Throttle

Motor

SPONSORED PROJECTS (APPLIED) IN LAST ONE YEAR

- Submitted a project titled Development of Algorithm for Optimal schedule generation for MEO Search and Rescue system (MEOSAR) ground segment at ISTRAC, Bangalore of Rs 21.13 Lacs to ISRO REPOND. (PI: **Dr. D. S. Acharya**; Co-PIs: Dr. S. K. Mishra, Mr. S. K. Swain, Prof. S. Chakraborty).

- Submitted a project titled Automatic Shadow Detection for Solar Rooftop PV potential assessment and its impact on grid control and operation of Rs 30.36 Lacs to MNRE, GoI. (PI: **Dr. D. S. Acharya**; Co-PIs: Dr. Debomita Ghosh, Dr. Pankaj Mishra, Dr. Mili Ghosh Nee Lala).

PUBLICATIONS (LAST THREE YEARS)

Journal Papers

1. Rajesh Saikrishna, **Nilesh Kumar Rajalwal**, Debomita Ghosh, “Adaptive relay co-ordination using a busbar splitting approach for a system integrity protection scheme”, Protection and Control of Modern Power Systems, 7, 14, 2022.

2. **Gude, Srihari**, and Kartick Chandra Jana. "A multiagent system based cuckoo search optimization for parameter identification of photovoltaic cell using Lambert W-function." Applied Soft Computing 120, 2022.

3. **Gude, Srihari**, Kartick Chandra Jana, Antonino Laudani, and Sudhakar Babu Thanikanti. "Parameter extraction of photovoltaic cell based on a multi-objective approach using nondominated sorting cuckoo search optimization." Solar Energy 239, 359-374, 2022.

4. Prem Prakash, **R.C. Jha**, “Confidence Interval-A statistical Approach for DER Integration in Distributed System to Enhance Energy Harvesting”, Turkish Online Journal of Qualitative Inquiry, Vol. 12, No. 7, 2021.

5. **Piyush Kumar Ojha**, P. R. Thakura and S. Shiva Kumar “Generalized Transfer Function-based Modelling, Designing and Analysis of a Single-Stage Boost Inverter”, International Journal of Power and Energy Systems, ACTA Press, 2021.

6. **Deep Shekhar Acharya**, Sudhansu Kumar Mishra, Ganapati Panda, “A Comparative Performance Assessment of Evolutionary Fractional Order PID Controllers for Magnetic Levitation Plant with Time Delay”, Journal of Scientific and Industrial Research (JSIR), CSIR, Vol. 80. No. 04, pp. 322-327, 2021.

7. **Acharya, Deep Shekhar** and Mishra, Sudhansu Kumar, "Optimal Consensus Recovery of Multi-agent System Subjected to Agent Failure", International Journal on Artificial Intelligence Tools, World Scientific, Vol. 29, No. 6, 2050017, 2020.

PUBLICATIONS (LAST THREE YEARS)

Journal Papers

8. **Rajalwal, Nilesh Kumar** and Ghosh, Debomita, "Recent trends in integrity protection of power system: A literature review", International Transactions on Electrical Energy System, Wiley, July 2020.

9. **Gude, Srihari**, and Jana, Kartick Chandra, "Parameter extraction of photovoltaic cell using an improved cuckoo search optimization." Solar Energy, vol. 204, pp: 280-293, 2020.

10. **Acharya, D.S.**; Swain, S.K.; and Mishra, S.K., "Real-Time Implementation of a Stable 2 DOF PID Controller for Unstable Second-Order Magnetic Levitation System with Time Delay", Arabian Journal for Science and Engineering, Vol. 45, Issue. 8, pp: 6311-6329, 2020.

11. **Acharya, Deep Shekhar**, and Mishra, Sudhansu Kumar, "A multi-agent-based symbiotic organisms search algorithm for tuning fractional order PID controller." Measurement, Vol. 155, 107559, 2020.

12. Mayank Singh, **R. C. Jha**, “Object Oriented Usability Indices for Multi-Objective Demand Side Management Using Teaching Learning Based Optimization”, Special Issue on Distributed Energy Resource Management, Energies, MDPI, 2018.

PUBLICATIONS (LAST THREE YEARS)

Conference Papers:

1. N. Mishra, V. Raghuvanshi, **M.J. Akhtar**, “Sawtooth Carrier-Based Modulation Technique for harmonic reduction in CHB Inverter”, IEEE 2nd International Conference on Sustainable Energy and Future Electric Transportation (SeFeT), Hydderabad, 2022.

2. **D. S. Acharya**, Baishali Sarkar, Divya Bharti, 'A Fractional Order Particle Swarm Optimization for tuning a Fractional Order PID Controller for Magnetic Levitation Plant', 1st IEEE Conference on Measurement Instrumentation Control and Automation (ICMICA-2020), NIT Kurukshetra, June 2020.

3. Sahil Raj, Vibhor Singh, **Nilesh Kumar Rajalwal**, Debomita Ghosh, “Reliability Prediction of a Distribution Protection Scheme Using Markov Model”, 8th International Conference On Reliability, INFOCOM Technologies and Optimization (IEEE), June 4-5, Amity University, Noida, India, 2020.

4. **D. S. Acharya**, Srihari Gude, Shudit Kumar, Shubham Kumar, "An Integral Sliding Mode Controller for Vertical Take-Off and Landing System", IEEE International Conference on Power Electronics & IoT Applications in Renewable Energy and It's Control (PARC-2020), GLA Mathura, Uttar Pradesh, 28-29 February, 2020.

5. **Nilesh Kumar Rajalwal** and Debomita Ghosh, "Petri net Modeling for Reliability Assessment of Integrity Protection Scheme", International Conference on Emerging Trends for Smart Grid Automation and Industry 4.0, BIT Mesra, Ranchi, December, 2019.

6. **Prabhat Kumar Ranjan**, **Piyush Kumar Ojha**, Parashuram Thakura and Aditya Kumar Singh, "Analysis of Solar fed Grid connected Single-Stage Single Phase Boost Inverter", International Conference on Emerging Trends for Smart Grid Automation and Industry 4.0, BIT Mesra, Ranchi, December, 2019.

7. **D. S. Acharya** and **Srihari Gude**, "A Multi-Objective Sliding Mode Controller for Magnetic Levitation Plant", International Conference on Emerging Trends for Smart Grid Automation and Industry 4.0, BIT Mesra, Ranchi, December, 2019.

PUBLICATIONS (LAST THREE YEARS)

Conference Papers

8. **D. S. Acharya**, S. K. Mishra, Shudit Kumar and Shubham Kumar, "Design of 2-Degree of Freedom Fractional Order PID Controller for Magnetic Levitation Plant with Time Delay", International Conference on Emerging Trends for Smart Grid Automation and Indutry 4.0, BIT Mesra, Ranchi, December, 2019.

9. **D. S. Acharya**, S. K. Mishra, B. Sarkar and D. Bharti, "Fractional Order Particle Swarm Optimization to optimize a Fractional Order PID Controller for a Vertical Take-Off and Landing System", International Conference on Emerging Trends for Smart Grid Automation and Indutry 4.0, BIT Mesra, Ranchi, December, 2019.

10. **N. K. Rajalwal** and Debomita Ghosh, "Adaptive Zone-III Relay Characteristic using System Integrity Protection Scheme", IEEE International Conference on Intelligent Systems and Green Technology, IEEE Vizag Bay Subsection, Vishakhapatnam, 29-30 June, 2019.

11. **D. S. Acharya**, S. K. Mishra, "Parameter Optimization of a modified PID Controller using Symbiotic Organisms Search for Magnetic Levitation Plant", International Conference on Intelligent Computing and Smart Communication (ICICSC), THDC-IHET, Tehri, Uttarakhand, 19-21 April, 2019, Springer.

Book Chapters

1. **N.K. Rajalwal**, Debomita Ghosh, "Superseding Mal-Operation of Distance Relay Under Stressed System Conditions", In: Wide Area Power Systems Stability, Protection, and Security, pp 393-421, Springer, 2021.

2. **Ojha, P.K.**, Thakura, P. R.,"Analysis of Voltage source Boost Inverter", Proceeding of the Second International Conference on Microelectronics ,Computing & Communication Systems (MCCS2017), Lecture Notes in Electrical Engineering, pp. 9-16, Springer, Singapore, 2019.

3. **Ranjan, P. K.**, Thakura, P. R., "Analysis of Single-Stage Three-Phase DC–AC Boost Inverter for Distributed Generation System", Nanoelectronics, Circuits and Communication Systems, Lecture Notes in Electrical Engineering, vol 511, (pp. 245-254). Springer, 2019

AWARD / RECOGNITION (FACULTY)

- Dr. Mohammad Junaid Akhtar, for his research article being in the top five highest-cited papers in 2019, in IET Electrical Systems in Transportation.
- Dr. Deep Shekhar Acharya, Best Paper of the session award, for *Design of 2-Degree of Freedom Fractional Order PID Controller for Magnetic Levitation Plant with Time Delay* in International Conference on Emerging Trends for Smart Grid Automation and Industry 4.0, BIT Mesra, Ranchi, December, 2019.
- Mr. Nilesh Kumar Rajalwal, Best Paper award for *Impact of DFIG on Voltage Stability of a Network in Smart Grid: An Analysis* in IEEE International Conference on Technologies for Smart-City Energy Security and Power (ICSESP-2018), March, 2018.

ACHIEVEMENTS OF EEE STUDENTS

1. Pushkar Upadhyay (BTECH/60006/18), Rishabh Raj (BTECH/60038/18) and Nitesh (BTECH/60136/18), have initiated a web-based startup PHILOZOOIC – a one point solution to pet care.

MECHANICAL ENGINEERING

- The Department of Mechanical Engineering was established in 2008 and offers the Undergraduate and Ph.D. programs.
- The department has over ten laboratories with recent stat-of-art equipments for conducting lab experiments and provide the students the experience at par with that of industry.
- Recently, Industrial Robot (KUKA) and PLC-based pneumatic trainer kit have been added, and a Subsonic wind tunnel will be added this year.

- **Courses :** (1) B.Tech. (2) Ph.D.
- **Number of laboratories:** 8
- **Intake:** 60
- **Number of faculty members:** 7

FACULTY MEMBERS

Arbind Kumar
Ph.D.
Professor &
In-Charge MECH
Area: Machine Design/CAD, Materials Technology.

Ashis Kumar Chakraborty
Ph.D.
Associate Professor
Area: Machine Design

Ritesh Kumar Upadhyay
Ph.D.
Assistant Professor
Area: Heat Power Engineering, Desalination Technologies

Gopisetti Srinivasa Rao
Ph.D.
Assistant Professor
Area: Machine Design, Dynamics & Control

FACULTY MEMBERS

Ashutosh Kumar
Ph.D. Pursuing
Assistant Professor
Area: Optimization
and Productivity Management.

Bibhanshu Sekhar Choudhary
M.Tech.
Assistant Professor
Area: Machine Design, Industrial
Management.

Anil Kr. Sharma
Ph.D.
Assistant Professor
Area: Theoretical-Computational-
Neuroscience and its application.

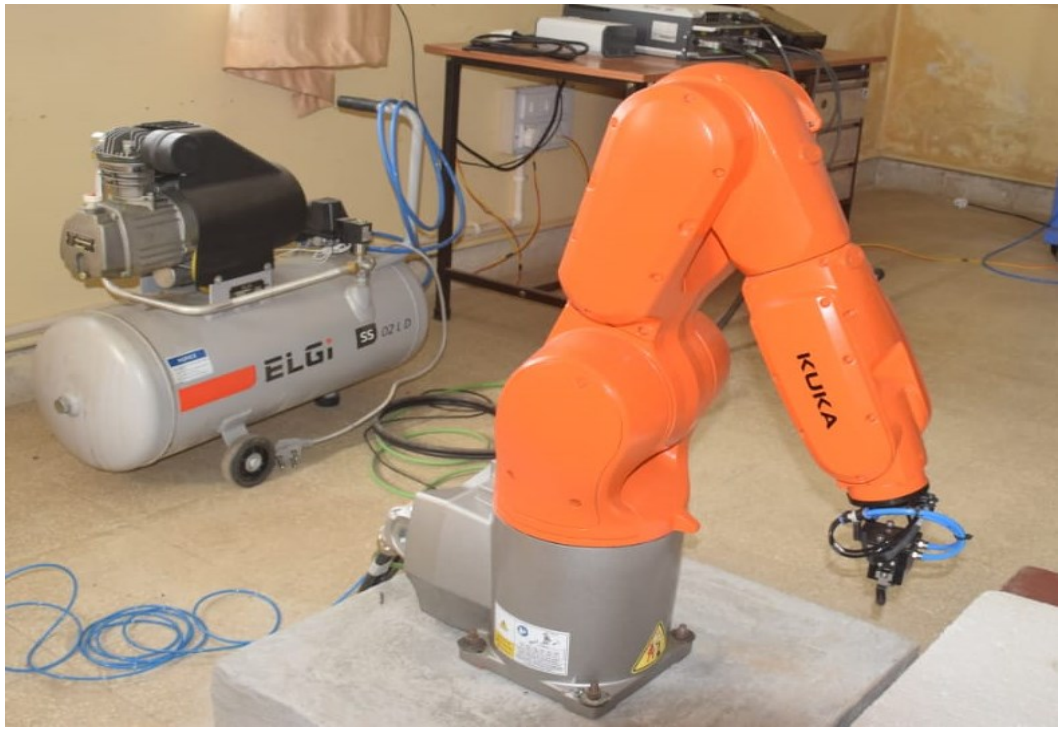
Praful Kr. Manoharan
Ph.D. Pursuing
Assistant Professor
Area: Non-conventional Energy,
Engineering for Society.

LABORATORIES

1. Mechanical Engineering Lab
2. Refrigeration & Air Conditioning Lab
3. I.C. Engine Lab
4. Heat Transfer Lab
5. Automobile Lab
6. Dynamics of Machine Lab
7. Simulation Lab
8. Engineering Drawing Lab

CAD Lab

Major Laboratory Equipments



Industrial Robot (KUKA)

Single Cylinder Variable Compression Ratio-Diesel Engine Test Rig

Major Laboratory Equipments

Three Cylinder MPFI Petrol Engine

Solar water Heating System
(Thermo Syphon type)

PLC based
Electro-pneumatic Trainer

THRUST AREA OF THE DEPARTMENT

Augmentation of Unmanned Aerial Vehicle (UAV)

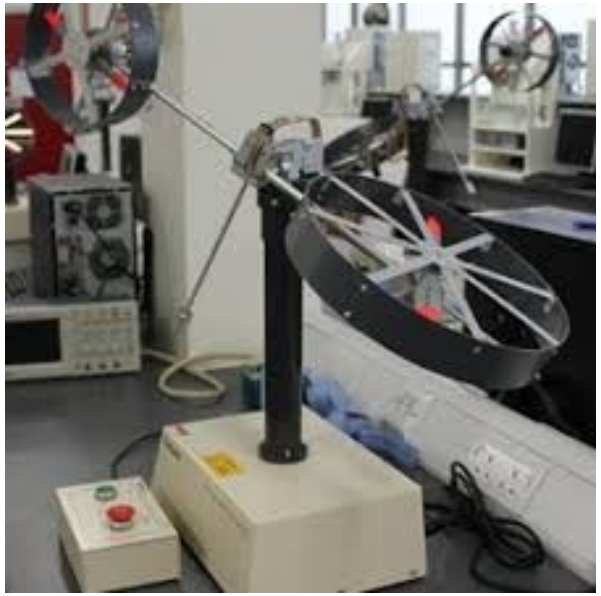
- Detailed and exact modelling of UAV.
- Structural analysis of the UAV under varying loads and conditions.
- Cooperative flight control for a swarm of UAVs.
- Fault diagnosis and fault tolerant control strategies.
- Testing and experimental validation of the design.

RESEARCH ACTIVITIES IN THE DEPARTMENT

Srinivas Rao Gopisetti

Modeling, Control and Model based Fault Diagnosis of Unmanned Aerial Vehicles

- Complete Dynamic Modeling of Quadcopters through Bond Graph Approach.
- Model Order Reduction of the Developed Model.
- Robust Model based Fault Tolerant Controller Synthesis.
- Testing and Performance Analysis of Developed Controllers Using the Laboratory Experimental Setups (Dynamically Similar or Equivalent Systems).
- Fault Modeling of the Vertical Take off and Landing Aerial Vehicles and Validation of the Models.
- Based on the Validated Models, Development of Fault Diagnosis Strategies and Fault Tolerant Controller for the Systems.



Laboratory Experimental Setup
Twin Rotor MIMO System

Anodic dissolution characteristics of 100Cr6 in K2Cr2O7 mixed NaCl and CuSO4 mixed NaCl electrolyte solutions

R. K. Upadhyay

In electrochemical machining the rate of dissolution is significantly affected by the nature of electrolyte solution which plays a key role in current carrying process. In this context, the impact of three different electrolyte compositions on the electrochemical dissolution of 100cr6 are investigated. These electrolytes are, aqueous sodium chloride (NaCl), potassium dichromate (K2Cr2O7) mixed NaCl and copper sulphate (CuSO4) mixed NaCl. The oxidation and reduction reaction schemes of dissolution were analyzed using cyclic voltammetry (CV) technique. The observations show that K2Cr2O7 mixed NaCl electrolyte results in a more oxidation of metal atoms into higher valence state while with CuSO4 mixed NaCl, it remained less oxidized in the solution. Moreover, we are trying to do the electron microscope photography of surface to confirm the precipitation during dissolution.

Flushing Enhancement with Flow Induced Vibration in Electrochemical Machining Tool

R. K. Upadhyay

In electrochemical machining (ECM), low frequency vibration of tool plays a vital role for the removal of dissolution by-products like metal hydroxide and gas bubble from the inter electrode area. The accumulation of these by-products lowers the specific conductivity of electrolyte which in turn, reduces MRR and deteriorates the surface finish of machined workpiece. The continuous flushing of such nonconducting by-products is essential to improve the machining accuracy, efficiency, quality and productivity. In this direction, we have proposed a novel technique i.e flow-induced vibration due to structural changes/modifications in the ECM tool to produce the desired low frequency vibration in the tool. To observe the adequacy of the technique, the vibration amplitude and frequency of the tool will be computed through theoretically developed mathematical model and computer simulation using CFD tool ANSYS Fluent.

PUBLICATIONS (LAST THREE YEARS)

Journal Papers

1. Shyam Sundar Majhi, Narendra Yadav and **Ashis Kumar Chakraborty**, “Development of periodic colored bands via frontal polymerization”, Journal of the Indian Chemical Society, 2022.
2. **Srinivasarao, Gopisetti**, Arun K. Samantaray, and Sanjoy K. Ghoshal. “Cascaded adaptive integral backstepping sliding mode and super-twisting controller for twin rotor system using bond graph model.” ISA Transactions, 2022.
3. **Srinivasarao, Gopisetti**, Arun K. Samantaray, and Sanjoy K. Ghoshal. "Bond graph modeling and multi-body dynamics of a twin rotor system." Proceedings of the Institution of Mechanical Engineers, Part I: Journal of Systems and Control Engineering 235, no. 1, 117-144, 2022.
4. T. K. Mishra, **A. Kumar**, S. K. Sinha, Sliding Wear Behavior of Thermally Sprayed WC-20Cr3C2-7Ni and La2O3 Composite Coatings, Emerging Materials Research Volume 10 Issue 2, pp. 1-9, 2021.
5. T. K. Mishra, **A Kumar**, S K Sinha, Experimental investigation and study of HVOF sprayed WC-12Co, WC-10Co-4Cr and Cr3C2-25NiCr coating on its sliding wear behaviour, Int. J. of Refractory Metals and Hard Materials (Elsevier), Volume 94, January 2021, 105404.
6. **Sharma A**, Mishra B K, Dinesh A, and Misra A., “Concentration and Temperature Profile of LiBr Aqueous Solution Flowing Over Horizontal Tube with Film Redistribution” International Journal of Engineering Research, Technology, 9(11):268-276, 2020.
7. **Sharma A K**, Sharma A., “Value recognition for adaptability of circular economy in India”, International Journal of Management and Social Science Research Review, 7(1):64-75, 2020.

PUBLICATIONS (LAST THREE YEARS)

Journal Papers

8. **Sharma A K**, Sharma A., "Sustainability of Ground Mounted Solar Photo-Voltaic based Mega Power Plant in India", International Research Journal of Modernization in Engineering Technology and Science, 2(7):141-146, 2020.
9. Neha Verma, Shraddha Agrawal, Vinay Sharma, Somnath Chattopadhyaya, Shubham Sharma, **Praful Kumar Manoharan**, Shashi Prakash Dwivedi, S. Rajkumar, "Resource Allocation system in Cloud Manufacturing Environment using Genetic Algorithm: A novel approach to reduce the complexity of manufacturing system", Mathematical problems in Engineering, 2021.

Book Chapter

1. Sanjiv Tiwari and **Ritesh Upadhyay**, "Effect of spiral pattern of jet on material removal rate and surface roughness during electrochemical machining of 100cr6 in NaCl", Recent Advances in Smart Manufacturing and Materials, 453-464, 2020.

Conference Papers

1. Sanjiv Tiwari and **Ritesh Upadhyay**, "Effect of spiral pattern of jet on material removal rate and surface roughness during electrochemical machining of 100cr6 in NaCl", International Conference on Evolution in Manufacturing ICEM - 2020 organized by MNIT Jaipur In association with NIT Uttarakhand & NIT Warangal, December 10-12, 2020.

DEPARTMENT OF PHYSICS

- The Department of Physics was established the year 2007. Presently Undergraduate and Ph.D. programs in Physics are offered.
- The department has an undergraduate Physics lab for the B. Tech students and sufficient space to carry out theoretical research. Currently the department has three regular faculty members and a Junior Technical Superintendent.

  - **Courses:** (1) Physics (theory and lab) for the 1st year B. Tech. students

    (2) Ph.D.
  - **Number of Laboratories:** 1
  - **Number of faculty members:** 3

FACULTY MEMBERS

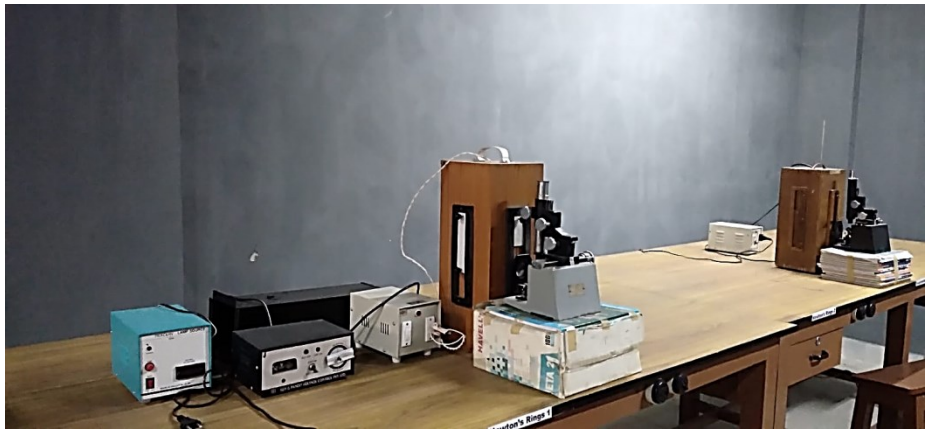
R. K. Sarkar
Ph.D.
Assistant Professor &
In-Charge Phys.
Area: Nonlinear Optics

S. Karmakar
Ph.D.
Assistant Professor
Area: Nanomaterials processing, Thermal plasma reactor designing and optimization

M. K. Dutta
Ph.D.
Assistant Professor
Area: High-Speed Optical Networks, Semiconductor Devices

LABORATORY

1. Physics Lab
2. Theoretical Research Lab



THRUST AREA OF THE DEPARTMENT

- Non-linear optics (theoretical)
- Optical Communication (theoretical)
- Image Processing, Materials Science
- Nanoscience and Technology
- Plasma Processing of Materials

SPONSORED PROJECTS

Ongoing

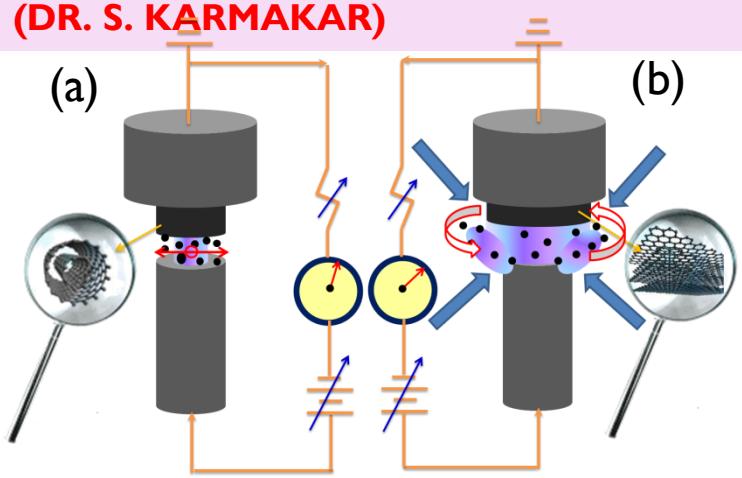
- One sponsored project funded by INSA on Reconstruction and digitization of PATAH Art, a perishing cultural heritage of Eastern India with special reference to Santhal Parganas, of Project amount 7,15,440/-. (PI: Dr. M. K. Dutta)

Applied

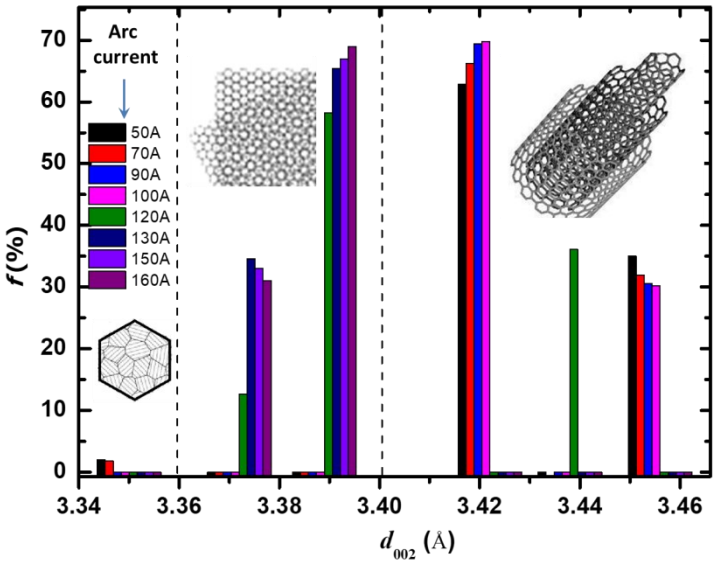
- One project proposal, on Investigation on efficient and value-added management of temple: An effort towards environmental sustainability and clean India submitted to DST-SERB by Dr. M. K. Dutta & Dr. R. K. Sarkar

TAILORED SYNTHESIS OF CARBON NANOTUBE AND LAYERED-GRAPHENE BY ELECTRIC ARC

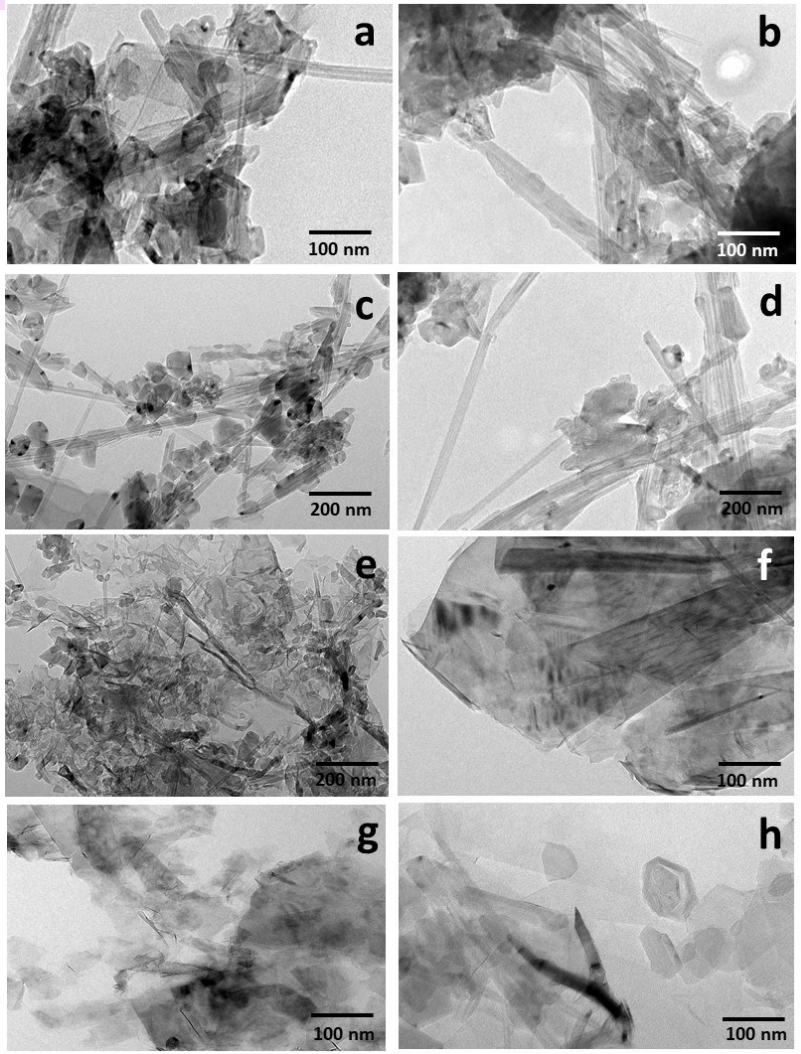
(DR. S. KARMAKAR)



(a) constricted and (b) intense arc modes achieved through arc-current variation



Species fractions and inter-planer separation (measured by XRD) of the basal planes as a function of the arc-current.



TEM images of the nanostructures found inside the cathode-deposit at different arc-currents. Arc-current was increased constantly corresponding to the samples (a) to (h).

- Selective synthesis of CNT and FLG has been achieved by systematically varying the DC arc-current between two roughly-oriented graphite electrodes.
- The number of walls in the CNT and layer-numbers in graphene have been found to be affected by the heat transfer coefficient of the buffer-gas medium.
- Rapid movement of the anode-spot was found responsible for peeling off carved graphitic nanoribbons (c-GNR) from the anode surface on account of cold thermal shock driven failure.
- c-GNR was found to be the seed structure, which evolves either as CNT or FLG inside the discharge.
- The length of the CNT and the planer span of the FLG have been predicted to be affected by the time of flight of the c-GNR in the discharge zone, whose temperature remained below the graphite sublimation point.

For more details, refer to (a) **Karmakar S.** (2020) *Nanotechnology*, *32*(10), 105602. (b) **Karmakar S.** *et al.* (2014) *Carbon*, *67*, 534-545.

RESTORATION AND QUALITY IMPROVEMENT OF DISTORTED TRIBAL ARTWORKS USING PARTICLE SWARM OPTIMIZATION AND NONLINEAR FILTERING TECHNIQUES (Kaur, M., **Dutta, M. K.** (2021) *Optik*, *245*, 167709. I.F. 2.89)

Input image

Median filtering and CLAHE output image

Median filtering and BBHE output image

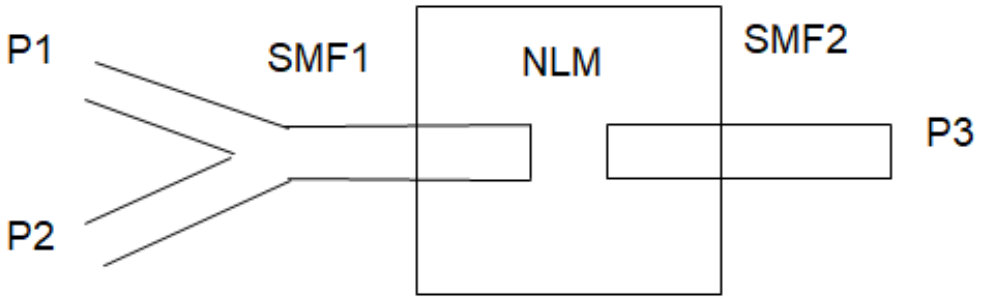
Median filtering and PSO output image.

Parameters	CLAHE	BBHE	DSIHE	PSO
PSNR	13.0179	13.2692	12.8856	30.0172
AMBE	18.7354	6.4264	8.2388	0.6928
NMSE	0.1111	0.1049	0.1146	0.0022
CPP	16.3082	22.3943	21.7871	22.4651
MSE	3.2455e+03	3.0631e+03	3.3459e+03	64.7676

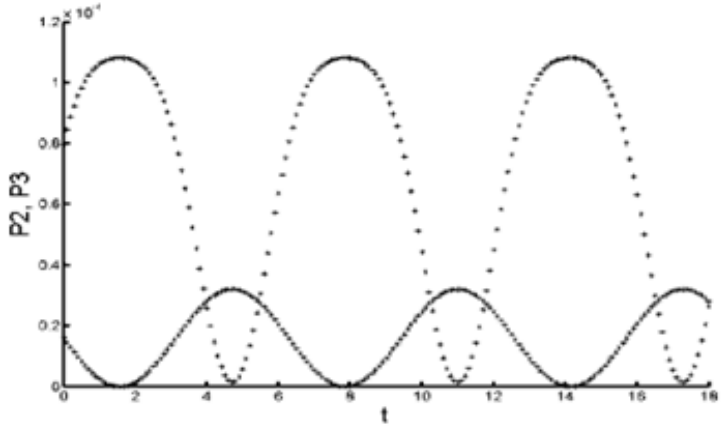
On comparison, it is found that the method involving PSO gives the best results. Noises of the distorted images are removed using nonlinear median filter. PSO removes noises from the image, makes image clearer with distinct boundaries and does not over contrast it, maintaining the original colours of the artwork

ALL-OPTICAL PASSIVE TRANSISTOR (THEORETICAL)

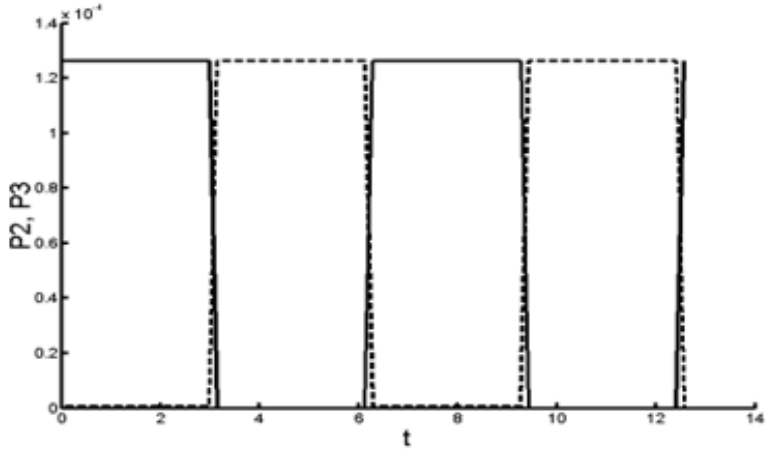
(BY DR. R. K. SARKAR)



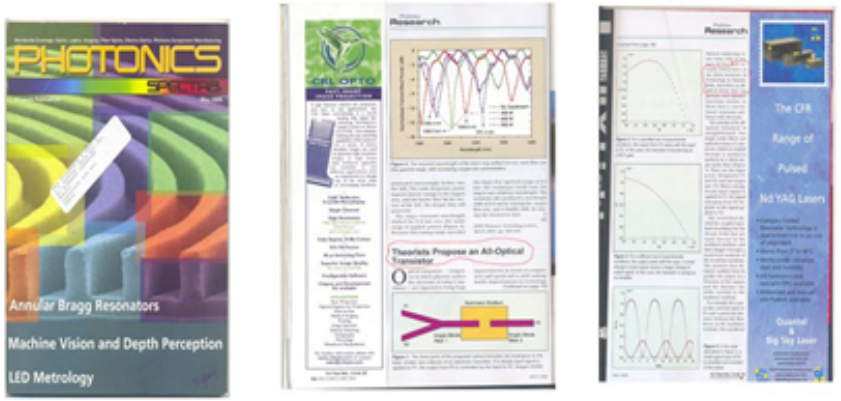
Schematic diagram of the all-optical transistor.



Inverted and amplified output is obtained. The performance of the device in this case resembles electronic transistor.



The Timing diagram. The performance of the Device resembles electronic NOT gate.



The work was covered and highlighted in Photonic Spectra Magazine

The NOT logic and amplification of a given signal in common emitter configuration is obtained using two single-mode fibers facing each other in a nonlinear medium

PUBLICATIONS (LAST THREE YEARS)

1. **Karmakar, S.,** Selective synthesis of DC carbon arc-generated carbon nanotube and layered-graphene and the associated mechanism. Nanotechnology, 32(10), 105602, 2020.
2. **Dutta, M. K., Sarkar, R. K., & Karmakar, S.,** Fabrication and characterization of CdS-Cu2S thin film heterojunction diode using chemical bath deposition technique. Bulgarian Chemical Communications, 158, 2021.
3. Srivastava, R., Chattopadhyay, J., Patel, R., Agrawal, S., Nouseen, S., Kumar, S., & **Karmakar, S.,** Highly efficient ternary hierarchical NiV2S4 nanosphere as hydrogen evolving electrocatalyst. International Journal of Hydrogen Energy, 45(41), 21308-21318, 2020.
4. **Dutta, M. K.**, Kaur, M., & **Sarkar, R. K.**, Comparative performance analysis of Fuzzy Logic and Particle Swarm Optimization (PSO) techniques for image quality improvement: With special emphasis to old and distorted folk paintings. Optik, 254, 168644, 2022.
5. **Dutta, M., & Sarkar, R. K.**, Design and Performance Analysis of Feedback Based Contention Resolution Technique for Optical Burst Switching (OBS) Network in Nonlinear Medium. Nonlinear Optics, Quantum Optics: Concepts in Modern Optics, 56, 2022.
6. **Dutta, M. K.**, Kaur, M., & **Sarkar, R. K**., Image quality improvement of old and distorted artworks using fuzzy logic technique. Optik, 249, 168252, 2022.
7. Prasad, S., **Dutta, M. K., & Sarkar, R. K.**, Breather pair formation in holographic medium. Optik, 245, 167742, 2021.
8. Kaur, M., **Sarkar, R. K., & Dutta, M. K.**, Investigation on quality enhancement of old and fragile artworks using non-linear filter and histogram equalization techniques. Optik, 244, 167564, 2021.
9. **Sarkar, R. K.**, Biswas, A., & Medhekar, S., Investigation of coupled self-tapering/self-uptapering of soliton beams in nonlinear media. Optik, 232, 166511, 2021
10. Sarkar, R. K., & **Dutta, M. K.**, Coupled propagation of two beams in cubic quintic nonlinear medium. Optik, 227, 166093, 2021.
11. Kaur, M., & **Dutta, M. K.**, Restoration and quality improvement of distorted tribal artworks using Particle Swarm Optimization (PSO) technique along with nonlinear filtering. Optik, 245, 167709, 2021.

DEPARTMENT OF CHEMISTRY

- Since its inception in 2007, the department has been engaged in teaching Engineering Chemistry and Environmental Science courses for undergraduate students. The Department has well-established fuel technology and water quality testing laboratory.
- The faculties of the department are engaged in research work in the area of Oscillatory Chemical reactions, Pattern Formation, Frontal polymerisation, Environmental Pollution and Electro Chemical Machining.
- The department is involved in promoting environmental awareness amongst the tribal and rural population. The department has already started Ph.D. program and is motivated towards quality research.

- **Courses:** (1) Chemistry (theory and lab) & Environmental Science for B. Tech. students.

  (2) Ph.D.
- **Number of Laboratories:** 1
- **Number of faculty members:** 2

FACULTY MEMBERS

Shyam Sundar Majhi
Ph.D.
Assistant Professor &
In-Charge Chem.
Area: Physical Chemistry, Frontal Polymerization, Chemical kinetics & Oscillatory Reaction.

Ashish Chandra Singh
Ph.D.
Assistant Professor
Area: Adsorption, Polymer Synthesis, Water Quality Monitoring and Control

LABORATORY

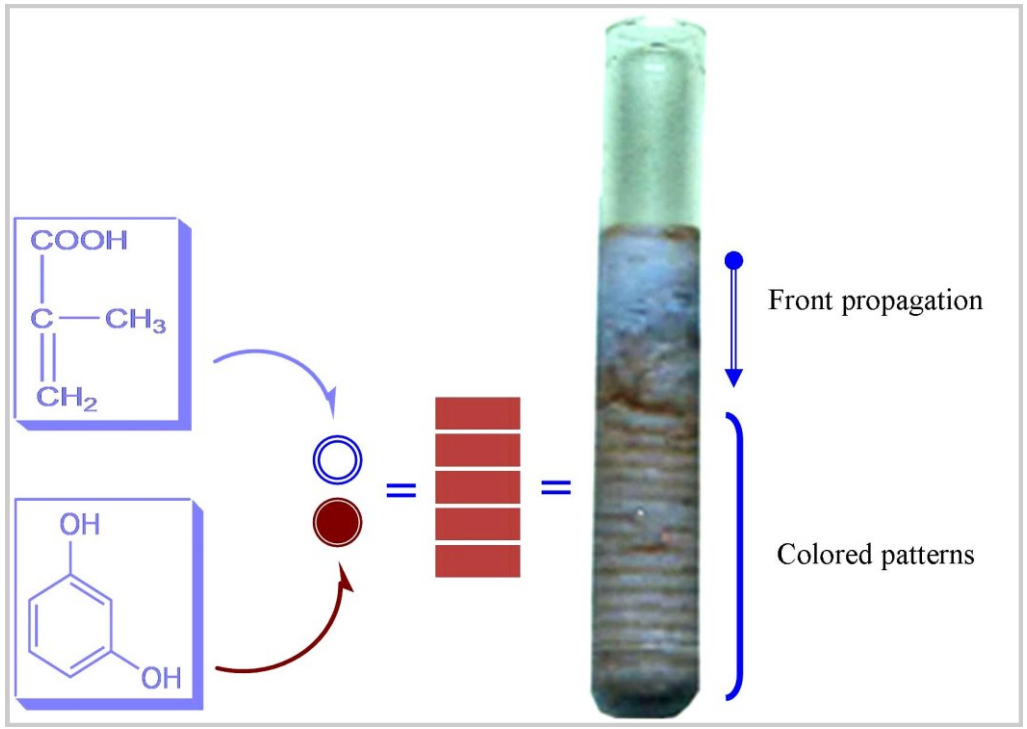
1. Chemistry Lab
2. Water Quality Testing Lab

THRUST AREA OF THE DEPARTMENT

- Development of polymer-based composite materials in the following areas:
- Light weight polymeric composites via frontal polymerization
- Polymer supported membrane for fuel cell applications
- Polymeric composite for biomedical applications
- Green nano composites for energy storage

WHITE AND BROWN COLOUR POLYMER BAND FORMATION THROUGH FRONTAL POLYMERIZATION

(BY DR. S. S. MAJHI)



- Periodic colored bands were investigated in MAA-resorcinol reaction system via frontal polymerization process.
- Two polymeric phases having two distinct colors were formed which crystallizes periodically during the FP reactions
- Periodicity and band gaps were tuned with the help of optimal concentration of resorcinol, BP and EtOH.
- Possible reaction mechanism for FP reaction was proposed for proper understanding the structure-property relationship.

PUBLICATIONS (LAST THREE YEARS)

1. **S. S. Majhi** "Frontal polymerization in chemical system" International Webinar on ''Recent Advances in Science and Technology During the Corona Virus Pandemic- 2020', Organized by Department of Chemistry, BIT Mesra Ranchi, 2020.
2. **Shyam Sundar Majhi**, Narendra Yadav and Ashis Kumar Chakraborty, "Development of periodic colored bands via frontal polymerization", Journal of the Indian Chemical Society, 2022.

DEPARTMENT OF MATHEMATICS

- The department of Mathematics started functioning with the institute in 2007. The department conducts comprehensively the courses of Mathematics offered in all branches of engineering up to graduate level (B. Tech. Program).
- The department is equipped with modern computers with the latest scientific software such as Matlab, Mathematica, Minitab, etc.

- **Courses :** (1) Mathematics, Numerical Methods (theory and lab) for the B. Tech. students

  (2) Ph.D.

- **Number of faculty members:** 3

FACULTY MEMBERS

Ranjan Chattaraj
Ph.D.
Assistant Professor &
In-Charge Maths.
Area: Elastodynamics, Theoretical Seismology

Amit Kumar
Ph.D.
Assistant Professor
Area: Fluid Dynamics, Generalized Thermoelasticity

Bishnu Kumar
Ph.D.
Assistant Professor
Area: Ocean Modeling, Optimization, Mathematical Modeling, Data Analysis

THRUST AREA OF THE DEPARTMENT

- Ocean Modelling
- Elastodynamics
- Fluid Dynamics

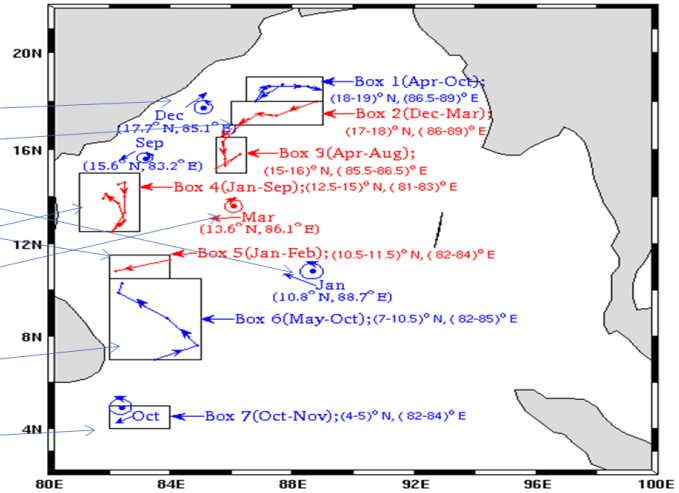
RESEARCH ACTIVITIES IN THE DEPARTMENT

- Research of Dr. Bishnu Kumar is focused on oceanic data analysis in the domain of Bay of Bengal. Besides, he is also engaged in the development of optimization of models, related to oceanography, and its numerical solution.
- Dr. Ranjan Chattaraj is engaged in the analysis of surface wave propagation through multi phase porous medium related to layered structure of earth interior.
- Dr. Amit Kumar is working on various models of MHD fluid flows through porous media.

ANALYSYS OF OCEANIC DATA OF THE BAY OF BENGAL (BY DR. BISHNU KUMAR)

Average (climatological) circulations (Eddies, Gyres) over the bay of Bengal (BOB)

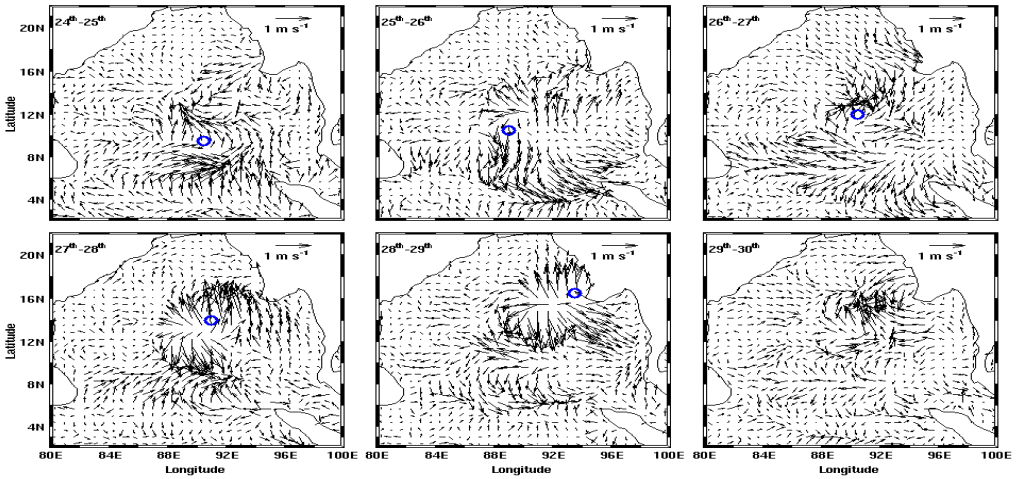
Type of eddy	Time of formation to lifespan	Location of formation /region
Cyclonic	Dec	17.7◦N, 85.1◦E
Anti-cyclonic	Dec-Aug	Boxes 2 and 3
Cyclonic	Jan	10.8◦N, 88.7◦E
Anti-cyclonic	Jan-Feb	Box 5
Anti-cyclonic	Jan-Sep	Box 4
Anti-cyclonic	Mar	13.6◦N, 86.1◦E
Cyclonic	Apr-Oct	Box 1
Cyclonic	May-Oct	Box 6
Cyclonic	Sep	15.6◦N, 83.2◦E
Cyclonic	Oct-Nov	Box 7



- Box 1 (18°N-19°N, 86.5°E-89°E)
- Box 2 (17°N-18°N, 86°E-89°E)
- Box 3 (15°N-16.5°N, 85.5°E-86.5°E)
- Box 4 (12.5°N-15°N, 81°E-83°E)
- Box 5 (10.5°N-11.5°N, 82°E-84°E)
- Box 6 (7°N-10.5°N, 82°E-85°E)
- Box 7 (4°N-5°N, 82°E-84°E)

The synopsis of the eddies encountered in the BOB

Simulation of Real Cyclonic Track Using High Resolution Ocean Model System (ROMS)– A case study of Cyclone Mala



Model simulated currents (10 m) difference for consecutive days during the passage of cyclones with IMD center (blue circle) for later days.

PUBLICATIONS (LAST THREE YEARS)

Journal Papers

1. S.K. Tiwari, R.K. Singh, **Bishnu Kumar**, Optimizing PM Intervals for Manufacturing Industries Using Delay-time Analysis and MOGA. Jordan Journal of Mechanical and Industrial Engineering (JJMIE), 16(3), 327 – 332, 2022.

2. G Mahapatra, P Pradhan, **R Chattaraj**, S Banerjee, Dynamic Graph Streaming Algorithm for Digital Contact Tracing. arXiv preprint arXiv:2007.05637, 2020.

Conferences

1. S Mitra, G Mahapatra, VE Balas, **R Chattaraj**, Public key cryptography using harmony search algorithm, Proceedings of ICIIF, Innovations in infrastructure (Springer), 1-11, 2019.

DEPARTMENT OF HUMANITIES AND MANAGEMENT

- The department of Humanities and Management of BIT off campus Deoghar was started in the year of December 2011.
- The study of Humanities and Management intends to provide general knowledge and intellectual skills based on humanistic discipline. The Humanities department comprises of dept. of English and creative arts respectively.
- The BBA program was started from July 2020.

- **Courses :** Bachelor of Business Administration (BBA)
- **Number of faculty members:** 2

FACULTY MEMBERS

Sandip Ghosh Hazra
Ph.D.
Assistant Professor &
In-Charge H&M
Area: Marketing, Services Marketing

Sandip Kumar Sengupta
Ph.D.
Assistant Professor
Area: Marketing, General Management

Sunit Prasad
MBA
Visiting Assistant Professor
Area: Finance

Rashmi Kumari
MBA
Visiting Assistant Professor
Area: HR

THRUST AREA OF THE DEPARTMENT

- Marketing Management
- Human Resource Management
- Organization Behavior

THE WAY AHEAD

- **Incomplete infrastructure** was one of the major drawback for the campus. It has been solved this year.
- The major issue for the institute is its **locational disadvantage**.
- Another issue that has to be addressed in the future is the institute's visibility on the national platform during admission.
- The institute is working towards promoting various achievements through social media and other means.
- We believe that this campus has a promising future and will take an essential role in the socio-economic development of the society.

THANK YOU