

Hirak Mazumdar, Ph.D., MIEEE



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<https://www.linkedin.com/in/hirak-mazumdar-1a721019>



Objectives: Looking for Academic Collaboration in Engineering and Technology, Research and Development leadership role in the broader area of Data Science, Machine Learning and Software Development.

Talks about: #algorithm, #dataanalysis, #machinelearning, #quantummachinelearning and #healthcaredata.

Profile:

- Highly self-motivated research professional with demonstrated expertise in Computational Algorithm development using Machine Learning Technologies.
- Experience in Next Generation Data Sequencing for Industrial Manufacturing with strong interpersonal skills in algorithm development by Machine Learning, Deep Learning and AI.
- Developed Real time Software Interface for action plans to mitigate risks in groundwater contamination project under **Department of Energy (DoE), USA.**
- A strong background in Semiconductor Devices and Technology with proven track record of Quality Engineering under **Samsung Electronics, (Mechatronics R&D), Korea.**
- Developed Real time Software interface for Semiconductor Sensor Manufacturing Fault Detection using Machine Learning and Statistical Process Control (SPC) theory under **Samsung Electronics, (Mechatronics R&D), Korea.**
- Developed Real time Software Interface for Pattern Defect Detection in Car Manufacturing using Machine Learning and Statistical Process Control (SPC) theory under **Hyundai Motors, Seoul, Korea.**
- Highly self-motivated research professional with demonstrated expertise in computational algorithm development for semiconductor automation and manufacturing.
- Experience in next generation sequencing data analysis for semiconductor manufacturing.
- Rich experience in modeling and computer simulation, using MATLAB, COMSOL, Mathematica and additional experience in VLSI design using Cadence.
- A strong background in Semiconductor Devices and Technology, Bio-Medical image processing with applications for Bioinformatics, Lab-On-a-Chip, Biosensor, and Nano-Biosensor technology.
- Detail oriented with an analytical bent of mind and positive attitude.
- Proficiency at grasping new technical concepts quickly & utilizing them in a productive manner.
- Excellent business, engineering, product, leadership skills, 5+ years in research industry.
- Proven track record of quality engineering deliveries with Samsung Electronics, Korea in Manufacturing R&D.
- PhD and Over 10+ years of experience in leading multi-billion industries, research lab and academic industry.

Academic Qualifications:

Sogang University, Seoul, ROK
Ph.D., Biomedical Engineering, March 2016- February 2022

West Bengal University of Technology, Kolkata, India
M.Tech., Electronics and Communication Engineering, 2011

Guru Ghasidas Central University, MP, India
M.Sc., Physics (Electronics), 2009

Kalyani University, West Bengal, India
B.Sc., Physics (Honors), 2007

Postdoctoral Experience:



University of Houston-Victoria, Texas, USA.

Post-Doctoral Researcher. Department of Computer Science and Engineering, August 2022 – March 2023

Responsibilities: Design, prototype, and build AI/ML Models to derive actionable intelligence for soil and groundwater

Analyze and take decisions based on complex and ambiguous (big) data points and work with science and engineering teams to architect and develop operational models that run at scale. Conducting high quality research focused on Machine Learning, Deep Learning, Big Data, and Visualization with Hybrid (On-Premises & Cloud deployment) environment. Managing the technical tasks and providing reports and deliverables as required. Mentoring other staff and students in the areas related to applied artificial intelligence, also responsible for setup lab and equipment for project related needs directed by the principal investigator.

Tools: Python, PySpark, Jupyter Notebook

Algorithms: Neural Networks, Classification Algorithms, Data Visualization, Data Analysis.



Cheongju University, Cheongju, Republic of Korea.

Post-Doctoral Researcher. Division of Converged Electronic Engineering, December 2021 – July 2022

Responsibilities: ML-based Fast Standard Cell Library Generation

Timing and power characterization of standard cells is too time consuming due to a lot of simulations for hundreds of PVT corners and thousands of std. cell types. This increases SW licenses, and the schedule of circuit design can be affected if the libraries are not prepared in time. To reduce the runtime of library characterizing, we characterize the libraries of some corners, and those of remaining corners are predicted using ML models and the characterized ones, in which the number of corners used for training is minimized for further runtime reduction. For this work we use ML prediction model using U-net and get higher accuracy with 98.99% with 0.1 run time loss.

Tools: Python, Jupyter Notebook

Algorithms: Convolution Neural Network, Classification Algorithms, Time Series Clustering.

Research Experience:



Samsung Mechatronics R&D, Seoul, Republic of Korea.
Researcher. Department of Biomedical Engineering, December 2015-

February 2016.

Responsibilities: ML-based Semiconductor wafer synthesis and handling of for Samsung IoT devices

This report was designed to create an environment in which the Root Cause of failure for the different sensor can always be a reliable process to detect and solve them using the System techniques and requires a study to minimize the duration of the study can be obtained research development time and maximize performance. In addition, the need to develop technologies to control bad elements. The objective was to minimize the potential and actual failure rate as well their error rate by maximizing the Quality of Research and Development.

Tools: Python, SQL, MATLAB, KNIME, Spark, Tibco-Spotfire

Algorithms: Fault Prediction and quality testing of Semiconductor Sensors using Machine Learning algorithms.



Harvard Medical School, Feb 2021 - Jun 2021, Harvard, Massachusetts, United States

Responsibilities:

Developed and implemented image analysis algorithms to detect influenza virus in microarray images. Utilizing Python programming, I processed and analyzed large sets of image data. My research focused on enhancing the accuracy and efficiency of virus detection techniques. I collaborated with a multidisciplinary team to integrate findings into practical diagnostic tools, and documented research processes and outcomes for publication and further research.

Algorithms: Image processing and analysis algorithms for virus detection in microarray images.

Tools: Python, PySpark, Jupyter Notebook

Algorithms: Neural Networks, Classification Algorithms, Data Visualization, Data Analysis.

Teaching Experience:



Adamas University, Kolkata, India
Associate Professor, School of Engineering and Technology, July 2024-till

Responsibilities: Education and Teaching, Conducting Research, Grant Writing, Industry Project Collaboration.

Teaching specific courses across programs that assigned, guiding and mentoring students inside and outside the class, preparing students for interviews with external organizations, planning and delivering “learning and development” initiatives for students and counselling students. Conducting research focused on Machine Learning, Deep Learning, Predictive Data Analysis. Manage the technical tasks and provide reports and deliverables as required. Mentoring Graduate and Undergraduate students in the areas related to artificial intelligence (AI). Responsible for managing research grants for project-related needs.



Graphic Era (Deemed to be) University, Dehradun, India
Associate Professor, Department of Computer Science and Engineering, March 2024-July 2024

Responsibilities: Education and Teaching, Conducting Research, Grant Writing, Industry Project Collaboration.

Teaching specific courses across programs that assigned, guiding and mentoring students inside and outside the class, preparing students for interviews with external organizations, planning and delivering “learning and development”

initiatives for students and counselling students. Conducting research focused on Machine Learning, Deep Learning, Predictive Data Analysis. Manage the technical tasks and provide reports and deliverables as required. Mentoring Graduate and Undergraduate students in the areas related to artificial intelligence (AI). Responsible for managing research grants for project-related needs.



Woxsen University, Hyderabad, India.
Assistant Professor, School of Technology, Department of Computer Science and Engineering,
March 2023-March 2024

Responsibilities: Education and Teaching, Conducting Research, Grant Writing, Industry Project Collaboration.

Teaching specific courses across programs that assigned, guiding and mentoring students inside and outside the class, preparing students for interviews with external organizations, planning and delivering “learning and development” initiatives for students and counselling students. Conducting research focused on Machine Learning, Deep Learning, Predictive Data Analysis. Manage the technical tasks and provide reports and deliverables as required. Mentoring Graduate and Undergraduate students in the areas related to artificial intelligence (AI). Responsible for managing research grants for project-related needs.



RVS College of Engineering and Technology, Jamshedpur, India.
Assistant Professor, Department of Electronics and Communication Engineering, February 2011-
February 2016

Responsibilities: Education and Teaching

Assistant Professor (Faculty) in Electronics & Communication Engineering with 5 years’ experience in academic industry. Teaching, Research, Business Strategy, Electronics, Engineering, Detail Oriented, Analytical bent of mind, smooth functioning of the classes and laboratories, management of departmental faculty and staff etc. Member of the NBA committee of college, Course Co-Ordinator of ECE Department, Framing of Syllabus etc.

Research Interest:

- Sensor, Biosensor design with Machine Learning and IoT (Internet of Things).
- Reliability study and failure analysis of big data.
- Real time semiconductor sensor.
- Image Analysis/Processing.
- Algorithm development/Simulation.
- Computational/System Biology (Machine Learning, Artificial Intelligence, Deep learning)

Skills and Expertise:

- Real-Time Sensor, standard cell libraries, wafer error & defect analysis.
- Machine learning for computer-aided design (CAD), neuromorphic circuit design, and design methodology for new process technologies (e.g., self-aligned multiple patterning, airgap, stitch-induced via, etc.).
- Library characterization (PVT corner, delay, design automation, design tools, integrated circuit synthesis) for design technology co-optimization and their mathematical & statistical analysis.
- Real-Time tracking of defect analysis (Semiconductor automation, CMOS technology).

Computational Skills:

- **Software Handling:** COMSOL, Tibco Spotfire, OpenSim, Knime, Spark, Image J etc.
- **Programming language:** C++, PySpark, Python, MATLAB, R, SQL, Heidi SQL etc.
- **Platform:** Windows 10 and higher, Linux.
- **Major Libraries:** Pandas, TensorFlow, Keras, Scikit-learn, Pytorch, mxnet, NumPy, etc.
- **Development tools:** Jupyter-Notebook

Engineering Research Experience:

Sogang University, Seoul, Republic of Korea

Ph.D. Candidate, February 2016 - February 2022.

Thesis Title: Development of machine learning algorithm for defect detection in the microfabrication process. (ISNI: 0000 0005 0588 2142), Web: ~ <https://isni.org/isni/0000000505882142>

Overview: Due to a convergence of enhanced computational power and cloud storage, significant improvements in Artificial intelligence (AI), sometimes called machine intelligence, have dramatically changed the landscape of science, industry, and medicine in the last several years. The stupefying success of Artificial Intelligence (AI) technology has shifted from theoretical studies in the discipline of computer science to real-life applications, coping with a variety of problems. This thesis is concerned with the development of new Machine learning algorithms and their application to various fundamental problems from healthcare to manufacturing industries. The thesis story is divided into three sections- biomedical engineering, chemical engineering, and semiconductor manufacturing engineering; all are related by the common thread of utilizing AI to enhance the expertise, either in real time image analysis or in the investigation of semiconductor sensor data.

Key Term:

1. Minimize the potential of defect density and determine the actual failure rate for yield rate.
2. Minimize Error rate by maximizing the quality during microfabrication process.
3. Remove the actual cause of the defect failure and measure quickly to detect root cause.

Engineering Project Experience: Samsung Electronics, Mechatronics R&D, Seoul, Republic of Korea (2016-2021)

- **Project Title: Defect detection equipment/installations and Real-time Classification Tuning Method.**

Overview: This report was designed to create an environment in which the Root Cause of failure for the different sensor can always be a reliable process to detect and solve them using the System techniques and requires a study to minimize the duration of the study can be obtained research development time and maximize performance. In addition, the need to develop technologies to control bad elements.

Key Term:

1. Minimize the potential and actual failure rate.
2. Minimize Error rate by maximizing the Quality of Research and Development.
3. Remove the cause of the failure to measure quickly detect the Root Cause.

Tools: Python, SQL, MATLAB, KNIME, Spark, Tibco-Spotfire

Major Responsibilities:

1. Build roadmaps of Machine Learning / Deep Learning applications for solving wafer defect analysis, including searching, ranking, recommending, predicting,
2. Define the roadmaps and develop and test prototypes as per requirements.
3. Deep Learning platform construction, system optimization, and model training acceleration user profiling.
4. End-to-end prototyping of Machine Learning algorithms.
5. Collaborate with engineering and business teams to productionize models, and to continuously monitor and improve model performance.

Goal: Inspection Equipment Defect through the Review Defect Classification by Wafer coordinates obtained using **KLA-AIT & Samsung Electronics, Republic of Korea**. Development process with Data storage with algorithms & development of equipment Tuning method suggested by the analysis of Defect.

Funding Proposals:

- **Project Title: Carbon-fiber reinforced polymers (CFRP) exposure part pattern defect detection algorithm development. Hyundai Motors, Seoul, Republic of Korea (2017-2018)**

Major Responsibilities:

1. Build roadmaps of Machine Learning / Deep Learning applications for solving ecommerce challenges, including searching, ranking, recommending, predicting, user profiling for pattern defect detection algorithm development.
2. End-to-end prototyping of Machine Learning products for carbon fiber sheet fault detection.
3. Collaborate with engineering and business teams to productionize models, and to continuously monitor and improve model performance.

Key Achievements:

Established and documented the best practices for processes: code testing, code peer review, data exploration, feature engineering, modeling, hyper-parameter tuning, experiment management, and model deployment.

Delivered the following prototypes which have been put into production and started delivering business values: Click-through fault prediction, Quality assessment, Manufacturing fault prediction and CFRP image search.

Tools: Python, sklearn, OpenCV

Algorithms: Deep Neural Networks, Classification Algorithms.

Major Courses For Teaching:

- Image Processing Theory
- Signal Processing
- Data Structure and Algorithm
- Machine Learning
- Deep Learning
- Natural Language Processing (NLP)
- Big Data and Storage and Hadoop System

Scientific Contributions:

Peer Reviewed Journal:

J1. Hirak Mazumdar, Tae Hyeon Kim, Jong-Min Lee, Jang Ho Ha, Christian D. Ahrberg, Bong Geun Chung (2018). "Prediction analysis and quality assessment of microwell array images", *Wiley, Electrophoresis*, 39, 948-956. **[IF: 3.595, SCI]**

J2. Jang Ho Ha, **Hirak Mazumdar**, Tae Hyeon Kim, Jong-Min Lee, Bong Geun Chung (2019). "Algorithm analysis of gas bubble generation in a microfluidic device", *Springer, Biochip Journal*, 13, 133–14. **[IF: 4.494, SCI (E) (Co-First Author)] (Selected as cover paper).**

J3. Hirak Mazumdar, Tae Hyeon Kim, Jong Min Lee, Euseok Kum, Seungho Lee, Suho Jeong, Bong Geun Chung (2021). "Sequential and Comprehensive Algorithm for Fault Detection in Semiconductor Sensors", *Applied Sciences*, 11(21), 10419. **[IF: 2.838, SCI (E)]**

J4. Hirak Mazumdar, Ajeet Kaushik, Hardik A. Gohel (2023); "To Mitigate PUEA Trajectory Using Cognitive SC-FDMA Approaches: Towards Next Generation Green IoT", *Wiley, Engineering Reports*, **[IF:2, ESCI]**

J5. MSVPJ Sathvik. Hirak Mazumdar, Abhilash Dowpati, MSSHV Prasad (2023). "Enhancing machine learning algorithms using GPT embeddings for binary classification" **TechRxiv**.

J6. Hirak Mazumdar, Chinmay Chakraborty, Satheesh Bojja Venkatakrishnan, Ajeet Kaushik, Hardik A. Gohel (2023); "Quantum-Inspired Heuristic Algorithm for Secure Healthcare Prediction using Blockchain Technology" *IEEE Journal of Biomedical and Health Informatics- (IEEE-JBHI)*, [IF: 7.7, SCI, Q1, A*]

J7. Beniwal, R., Kalra, S., Beniwal, N. S., **Mazumdar, Hirak.**, Singhal, A. K., & Singh, S. K. (2023). "Walk-to-Charge Technology: Exploring Efficient Energy Harvesting Solutions for Smart Electronics" (2023)-Wiley, *Journal of Sensor*, [IF 1.9, SCI, Q1]

J8. Hirak Mazumdar, Chinmay Chakraborty, MSVPJ Sathvik, Sabyasachi Mukhopadhyay, Prashant K. Panigrahi (2023) "GPTFX: A Novel GPT-3 Based Framework for Mental Health Detection and Explanations Approach", *IEEE Journal of Biomedical and Healthcare Informatics- (IEEE-JBHI)* [IF 7.7; SCI, Q1, A*]

J9. Hirak Mazumdar, Chinmay Chakraborty, MSVPJ Sathvik, Parvati Jayakumar, Ajeet Kaushik (2023) "Optimizing Pix2Pix GAN with Attention Mechanisms for AI-Driven Polyp Segmentation in IoMT-Enabled Smart Healthcare"- *IEEE Journal of Biomedical and Healthcare Informatics-(IEEE-JBHI)*; [IF 7.7; SCI, Q1, A*]

J10. Hirak Mazumdar, Chinmay Chakraborty, MSVPJ Sathvik, Bhuvan Unhelkar, Said Mahmoudi (2024) "Real-Time Mental Health Monitoring for Metaverse Consumers to Ameliorate the Negative Impacts of Escapism and Post Trauma Stress Disorder"-*IEEE Transactions on Consumer Electronics*; [IF 4.3; SCI, Q1, A*]

J11. Kamil Reza Khondakar, Divya Tripathi, **Hirak Mazumdar,** Ajeet Kaushik; Tailored MXene and Graphene as Efficient Telemedicine Platforms for Personalized Health Wellness, *Material Advances-RSC* (2023), [IF 5, SCI, Q1]

(This article is part of the themed collections: Recent Review Articles and Advanced materials for sensing and biomedical applications across the Royal Society of Chemistry)

J12. Kamil Reza Khondakar, M Shafiq Anwar, **Hirak Mazumdar,** Ajeet Kaushik; Perspective of point-of-care sensing system in cancer management, *Material Advances-RSC* (2023), [IF 5.2, SCI, Q1] *(Selected as Themed collection World Cancer Day 2024: Showcasing cancer research across the Royal Society of Chemistry)*

J13. Hirak Mazumdar, Suparna Das, Kamil Reza Khondakar, Ajeet Kaushik, Yogendra Kumar Mishra; "Quantum Biosensors: Principles and Applications in Medical Diagnostics"- *ECS Sensor Plus, IoP* (2024); [IF Tracking; ESCI, Q2], *(Corresponding Author)*

J14. Hirak Mazumdar, MSVPJ Sathvik; "Detection of Malicious Smart Contracts By Fine-tuning GPT-3 "- *Security and privacy, Wiley* (2024); [IF 1.9; ESCI, Q2]- *(Corresponding Author)*

J15. Hirak Mazumdar, Suparna Das, Kamil Reza Khondakar and Ajeet Kaushik; "Machine Learning Assisted Enhancement in Two-Dimensional Material's Sensing Performance"- *ACS Applied Nanomaterials*, (2024); [IF 5.9; SCI, Q1]- *(Corresponding Author)*

J16. Hirak Mazumdar, Suparna Das, Kamil Reza Khondakar and Ajeet Kaushik; "Aspects of 6th generation sensing technology: From Sensing to Sense"- *Frontiers in Nanotechnology*, (2024); [IF 4.1; SCI, Q1]- *(Corresponding Author)*
(This article is part of the Research Topic Thought Leaders in Nanotechnology Research)

Conferences:

CP1. "Human Visual System Models in Digital Watermarking" **Hirak Mazumdar,** Piyush Anand, Saraswati Jee Soni, Mridul Joshi, Kumar Rajeev, Manish Rajak (2015), 6th *International Conference and Workshop on Computing and Communication (IEEE-IEMCON 2015)* at University of British Columbia, Vancouver, Canada.

CP2. "Design of Multijunction Solar Cell Using AMPS-1D" Puja Verma, Tabassum Aara, Anshu Karna, **Hirak Mazumdar,** 6th *International Conference and Workshop on Computing and Communication (IEEE-IEMCON 2015)* at University of British Columbia, Vancouver, Canada.

CP3. “Optimized Machine Learning Model for Predicting Groundwater Contamination”; **Hirak Mazumdar**, Michael P Murphy, Shilpa Bhatkande, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *IEEE MetroCon 2022*, Hurst, TX, USA

CP4. “Recurrent-Convolutional Neural Network-Based (RCNN) Method for Modeling and Forecasting Groundwater Contamination”; Michael P Murphy, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *Waste Management Symposia (WMS) 2023*, Phoenix, Arizona, USA.

CP5. “Regression-Based Groundwater Contamination Detection and Monitoring using PyCaret”; Trang Huynh, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *Waste Management Symposia (WMS) 2023*, Phoenix, Arizona, USA.

CP6. “Seasonal Trend Assessment for Groundwater Contamination Detection and Monitoring using ARIMA Model”; Miguel A Barajas, Michael P Murphy, Louis C Lasseter, Godspower I Sunny, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *2nd International Conference on AI in Cybersecurity (ICAIC-2023)*, University of Houston, Texas, USA

CP7. “Long Short-Term Memory Networks (LSTM) for Monitoring Groundwater Contamination at the Hanford Site”; Michael P Murphy, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *2nd International Conference on AI in Cybersecurity (ICAIC-2023)*, University of Houston, Texas, USA

CP8. “S3T: A New Self-Supervised Learning with Swin Transformer”; **Hirak Mazumdar**, Suman Saha, Bhargav Prajwal Pathri and MSVPJ Satvik; IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation (IATMSI-2024), Gwalior, India; **(Corresponding & First Author)**

CP9. “Predictive Accuracy Analysis for Corona Virus Using Residual U-Net in Radiological Data”; Shanmuga Sundari M, Suparna Das, and **Hirak Mazumdar**; IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation (IATMSI-2024), Gwalior, India; **(Corresponding Author)**

Posters and Talks:

PO12. “A Time-Series Forecasting Based Predictive Modelling for Detection and Monitoring of (Cr-(VI)) Groundwater Contamination”; Barajas, Miguel A, Lasseter Louis C, Sunny Godspower I, **Hirak Mazumdar**, Hardik A Gohel, Hilary Emerson, Daniel Kaplan; *IEEE MetroCon 2022*.

PO11. “Advanced Artificial Intelligence Based framework for Detection and Monitoring of Groundwater Contamination”; **Hirak Mazumdar**, Michael P Murphy, Shilpa Bhatkande, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *IEEE MetroCon 2022*. *(This Poster was selected 3rd Place Winners Poster Contest in IEEE-MetroCon, 2022)*

PO10. “Artificial Intelligence-based Predictive Modeling for Groundwater Contamination and Physical Property Forecasting at the Hanford Site”; Michael P Murphy, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *Waste Management Symposia (WMS) 2023*, Phoenix, Arizona, USA

PO9. “Advanced Artificial Intelligence Based framework for Detection and Monitoring of Groundwater Contamination”; Trang Huynh, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *Waste Management Symposia (WMS) 2023*, Phoenix, Arizona, USA.

PO8. “Recurrent-Convolutional Neural Network-Based (RCNN) Method for Modeling and Forecasting Groundwater Contamination”; Michael P Murphy, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *Waste Management Symposia (WMS) 2023*, Phoenix, Arizona, USA.

PO7. “Long-Short Term Memory-Based (LSTM) Method for Modeling and Forecasting Groundwater Contamination”; Michael P Murphy, Shilpa Bhatkande, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *Waste Management Symposia (WMS) 2023*, Phoenix, Arizona, USA.

PO6. “Regression-Based Groundwater Contamination Detection and Monitoring using PyCaret”; Trang Huynh, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *Waste Management Symposia (WMS) 2023*, Phoenix,

Arizona, USA.

PO5. “Extreme Gradient Boosting Model for Groundwater Contamination Detection and Monitoring”; Shilpa Bhatkande, Michael P Murphy, **Hirak Mazumdar**, Hilary P Emerson, Daniel I Kaplan, Hardik A Gohel; *Waste Management Symposia (WMS) 2023*, Phoenix, Arizona, USA.

PO4. “ARIMA-Based Groundwater Contamination Detection and Monitoring”; Barajas, Miguel A, Lasseter Louis C, Sunny Godspower I, **Hirak Mazumdar**, Hardik A Gohel, Hilary Emerson, Daniel Kaplan; *Waste Management Symposia (WMS) 2023*, Phoenix, Arizona, USA.

PO 3. “The Microfluidic Device for Rapid Mixing Applications”; **Hirak Mazumdar**, Tae Hyeon Kim, Bong Geun Chung (2017), *Nano Korea, 2017*, Nano Biotechnology and Nanomedicine.

PO2. “Computational analysis of the shear stress in a microfluidic device”; **Hirak Mazumdar**, Tae Hyeon Kim, Bong Geun Chung (2017), *Nano Korea, 2017*, Nano Biotechnology and Nanomedicine.

PO1. “Prediction Analysis and Quality Assessment of Microwell Array Images”; **Hirak Mazumdar**, Tae Hyeon Kim, Bong Geun Chung (2018), *Nano Convergence, 2018*, Springer Biochip Society, Republic of Korea.

Patent:

PA1. **Hirak Mazumdar**, Tae Hyeon Kim, Jong Min lee, Bong Geun Chung (2019). “Method of Establishing Image Analysis Algorithm for Microwell Array” 16/237249 Jan 2, 2019, P2018-0014US (**US Patent**).

PA2. Bong Geun Chung, **Hirak Mazumdar**, Tae Hyeon Kim, Jong Min Lee. “Method for establishing image analysis algorithm for microwell array”, No:10-2072445, Jan 28, 2020.

PA3. **Hirak Mazumdar**, Certificate of Registration for a **UK Design**: Design number: 6288320 (Spill proof, Portable Medi Strip)

Book Chapter:

B1. Argade, N.U., **Hirak Mazumdar** (2023) “3D Printing: A Game Changer for Indian MSME Sector in Industry 4.0.” *New Horizons for Industry 4.0 in Modern Business. Contributions to Environmental Sciences & Innovative Business Technology.* Springer, Cham. **Print ISBN:** 978-3-031-20442-5 • **Online ISBN:** 978-3-031-20443-2

B2. Shilpa Bhatkande, **Hirak Mazumdar** and Hardik Gohel (2023) “AI and IOT for biomedical smart applications” *Contributions to Analytical Techniques for Biomedical Nanotechnology - Institute of Physics Publishing (IOP).* **Online ISBN:** 978-0-7503-3379-5 • **Print ISBN:** 978-0-7503-3377-1

B3. **Hirak Mazumdar** and Ajeet Kaushik (2023) “Lab-on-a-Chip – Artificial Intelligence, Computational Thinking and Quality Improvement for Health” *Contributions to Royal Society of Chemistry, UK.*

Professional Activities:

1. Korean Biochip Society, SPRINGER (**KBCS**), **Student Member**
2. Korea Institute of Marine Science & Technology Promotion (**KIMST-R&D**), **Student Member**
3. **Member Of IEEE (Hyderabad Section)**

Certification:

- **Programming Foundations: Algorithms**, LinkedIn 2022-09-10
- **Artificial Intelligence Foundations: Machine Learning**, LinkedIn 2022-09-17
- **Mistakes to Avoid in Machine Learning**, LinkedIn 2022-09-21.
- **Python Statistics Essential Training**, LinkedIn 2022-09-17

Review Services:

Reviewed: Nature (*Scientific Reports*), PLOS ONE, IEEE, Elsevier, Springer Nature, Frontiers, Hindawi.

Review Editor: Frontiers in Artificial Intelligence (Pattern Recognition) [SCI, Q1, IF 3]

Work Style:

- Willing to perform basic tasks and move on to solve complex problems.
- Able to learn new knowledge and adapt to new environments quickly.
- Strong independent work style and excellent teamwork skills.
- Well-organized and passionate.
- Proficiency in writing funded project.

Personal Skills:

- Communication
- Time Management
- Motivation to learn
- Critical Thinking

References

- Prof. Dr. Bong Geun Chung, Professor, Department of Mechanical Engineering and Department of Biomedical Engineering (Interdisciplinary Program of Integrated Biotechnology), Director of Bio Nano Technology Laboratory (BNTL), Sogang University, RA Hall 403, 35 baekbeom-ro, Mapo-gu, Seoul, Republic of Korea, 04107. Contact: +82-02-705-8823(O), + 82-02-712-0799(Fax), + 82-010-6490-1047(M), E-mail ID: ~ bchung@sogang.ac.kr
- Prof. Dr. Jong Ming Lee, Assistant Professor, Yeungnam University College, Division of Chemical Industry, 170, Hyeonchung-ro (Daemyeong-dong), Nam-gu, Daegu, 42415, Republic of Korea, Contact: +82-02-705-8823(O), +82-10-8702-4860 (M) E-mail ID: ~ caboera85@naver.com / jlee@ync.ac.kr
- Prof. Dr. Ajeet Kaushik, Assistant Professor, Director of NanoBioTech Laboratory, Health System Engineering, Department of Environmental Engineering, Florida Polytechnic University, Lakeland, FL 33805-8531 USA. Contact: Tel: +1-754-203-3737, E-mail ID: ~ akaushik@floridapoly.edu
- Prof. Dr. Hardik A Gohel, Assistant Professor, Director of Applied Artificial Intelligence Laboratory, Department of Computer Information Sciences, University of Houston-Victoria, Victoria, Texas 77901 USA. Contact: Tel: +1-786-376-5284, E-mail ID: ~ gohelh@uhv.edu