Rashi Agarwal

Associate Professor

Department of Computer Science and Engineering

Harcourt Butler Technical University, Kanpur -02

rashi@hbtu.ac.in, dr.rashiagrawal@gmail.com

DATE OF BIRTH

21/09/1975

PERMANENT ADDRESS

7/150 SWAROOP NAGAR, KANPUR, U.P. 208002

RESEARCH AREAS

Computer Vision, Machine Learning, Tiny ML, Data Science

EXPERIENCE

Harcourt Butler Technical University- *Associate Professor*

July '22- PRESENT

University Institute of Engineering and Technology,CSJM University - *Assistant Professor*

August 2006- July 2022

EDUCATION

Harcourt Butler Technical University - *B.Tech. CSE*

1994-1998 (Topper of the batch)

Harcourt Butler Technical University - *Ph.D. Image Processing*

2002-2006

ITC, Netherlands - *PGDGIS*

2010

AWARDS

2023 Certificate of Appreciation for NAAC related work from Raj Bhavan

2023 Certificate of Appreciation for NAAC related work from HBTU

2021 "Best contribution to Teaching" on Teachers Day, 2021 at CSJM University

2018 Award for Recognition for mentoring students by World Robotics Olympiad Team (WRO)

2016 Research Recognition by Cabinet Minister of Consumer Affairs

1998 First and highest package at ST Microelectronics, Noida, through Campus

1998 Gold Medal, Best B.Tech. project CSE batch of 1998 HBTI, Kanpur

1998 Gold Medal, Topper of B.Tech. CSE batch of 1998 HBTI, Kanpur

1994-1998 Recipient of Academic Performance Scholarship throughout B.Tech.

ADMINISTRATIVE EXPERIENCE

- November 2023- till date: **Associate Dean, Academics**, HBTU, Kanpur
- November 2022- November 2023: **Associate Dean, school of Humanities and Social Sciences**, HBTU, Kanpur
- November 2022- October 2023: **Warden,** Gangotri Hostel, HBTU, Kanpur
- September 2022- till date : **Assistant Exam Center Superintendent**, HBTU, Kanpur
- 2007- July 2022: **Head, Department of Information Tech**, UIET, CSJM University, Kanpur.
- May 2021- July 2022: **Associate Dean, Research and Development Cell,** CSJM University, Kanpur
- May 2021- July 2022: **Incharge, Project Monitoring Unit** which is developing the University website and ERP
- 2007-July 2022: **Member, Academic Council,** CSJM University, Kanpur.
- Jan 2018-May 2021: **Head, Innovation and Incubation Cell**, CSJM University, Kanpur.
- 2018-July 2022: **Head, Department of Vocational Studies,** UIET, CSJM University, Kanpur.
- 2018- July 2022: **Convener, Placement Cell,** CSJM University, Kanpur.
- 2009-2013: **Head, Placement Cell**, UIET, CSJM University, Kanpur
- 2018- July 2022: **In-charge, Social Media Cell,** CSJM University, Kanpur
- 2009-July 2022: **Member, Academic Advisory,** UIET, CSJM University, Kanpur
- 2009-July 2022: **Member, Purchase Committee,** UIET, CSJM University, Kanpur
- 2009-July 2022: **In-charge, AICTE Affiliation**, UIET, CSJM University, Kanpur

PATENTS

- Patent number: 2020103527 (IP Australia)
  Title of the invention: IPDN- Read Handwriting: Intelligent Process to Read Handwriting Using Deep Learning and Neural Networks
  Name of the inventor(s): Nandkumar Phursule, Rajesh; Kumar Beniwal, Rajender; Agarwal, Rashi; Bist, Ankur Singh; Singh, Ashay;
  Term of Patent: Eight years from 19 November 2020

- Design No. : 392874-001 on Date : 17/08/2023
  Title "RFID BASED WAREHOUSE ROBOT"
  Name of Inventors: .Dr. M.Balakrishnan, Dr. V.Kannan, Nirmal Singh, Dr. Rashi Agrawal, .Dr Hushmat Amin Kar, .Dr Atul Kumar

- Design No. : 392380-001 on Date : 10/08/2023
  Title "IoT BASED SMART HOME MONITORING DEVICE"
  Name of Inventors: Mrs. Sushma N, Dr. Santhosh Kumar K, .Dr.Veto Dey,.Dr. V.Kannan,.Dr. Rashi Agrawal, Dr. Ritu Gupta, Dr. P. K. Manoj Kumar

- Design No. : 384275-001 on Date : 19/04/2023
  Title "IoT ENABLED HEALTH MONITORING SYSTEM"
  Name of Inventors:.Er. Venkat Ghodke, Mr. G. Vijayasekaran,.Dr. Ashish Mulajkar,.Dr. Kuldeep Narayan Tripath, .Dr. Rashi Agarwal,.Er. Ela Vashishtha

BOOKS

Starting out with Python
T Gaddis, R Agarwal
Pearson
Computer Organisation and Design
R Agarwal
Acme Learning Private Limited 1, 1-473

MOOCS

Over 35 lakh views and 17k subscribers **Youtube Channel on Image processing using Matlab**

R Agarwal (https://www.youtube.com/c/rashiagrawal1)

INNOVATION

A Startup "Firstpreneurs Tech Pvt. Ltd" is. DPIIT registered (Certificate No.: DIPP53851) incubated at TBI, HBTU, Kanpur

RESEARCH PUBLICATIONS

1. A Hybrid EfficientNetB0-XGBoost Framework for Efficient Brain Tumor Classification Using MRI Images.
   Kumar, H., Pandey, D., Yadav, A., Agarwal, R., Tripathi, S., & Malhotra, S. K. (2025). In D. Pandey, B. Muniandi, B. Pandey, & A. George (Eds.), Interdisciplinary Approaches to AI, Internet of Everything, and Machine Learning (pp. 519-534). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3373-1032-9.ch033

2. ViT-HHO: Optimized vision transformer for diabetic retinopathy detection using Harris Hawk optimization,
   Vishal Awasthi, Namita Awasthi, Hemant Kumar, Shubhendra Singh, Prabal Pratap Singh, Poonam Dixit, Rashi Agarwal, MethodsX, Volume 13, 2024, 103018, ISSN 2215-0161, https://doi.org/10.1016/j.mex.2024.103018.

3. Transformer-based decoder of melanoma classification using hand-crafted texture feature fusion and Gray Wolf Optimization algorithm,
   Hemant Kumar, Abhishek Dwivedi, Abhishek Kumar Mishra, Arvind Kumar Shukla, Brajesh Kumar Sharma, Rashi Agarwal, Sunil Kumar,
   MethodsX, Volume 13, 2024, 102839, ISSN 2215-0161, https://doi.org/10.1016/j.mex.2024.102839.

4. Unmasking VGG16: LIME Visualizations for Brain Tumor Diagnosis,
   R. Tiwari and R. Agrawal, 2024 IEEE International Conference on Computer Vision and Machine Intelligence (CVMI), Prayagraj, India, 2024, pp. 1-6, doi: 10.1109/CVMI61877.2024.10781708.

5. ViT-ALZ: Vision Transformer with Deep Neural Network for Alzheimer's Disease Detection.

   Kumar, H., Agarwal, R. (2024) In: Kumar, R., Verma, A.K., Verma, O.P., Wadehra, T. (eds) Soft Computing: Theories and Applications. SoCTA 2023. Lecture Notes in Networks and Systems, vol 971. Springer, Singapore. https://doi.org/10.1007/978-981-97-2089-7_16

6. Explainable Bayesian-Optimized XGBoost Model for Component Failure Detection in Predictive Maintenance. Kumar, H., Bhartiy, K. K., Dhabliya, D., Agarwal, R., Kumar, S., & Tripathi, S. (2024). In B. Pandey, U. Kanike, A. George, & D. Pandey (Eds.), AI and Machine Learning Impacts in Intelligent Supply Chain (pp. 137-155). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-1347-3.ch010

7. Tomato Disease Detection Using Vision Transformer with Residual L1-Norm Attention and Deep Neural Networks, Tiwari, M.; Kumar, H.; Prakash, N.; Kumar, S.; Neware, R.; Tripathi, S.; Agarwal, R. International Journal of Intelligent Engineering and Systems 2024 | DOI: 10.22266/ijies2024.0229.57

8. Advances in Deep Learning for the Detection of Alzheimer's Disease Using MRI: A Review
   Hariharan, S; Agarwal, Rashi; Computational Intelligence in Healthcare Informatics, Springer Nature, 363-388, 2024

9. Diabetic Retinopathy Segmentation in IDRiD using Enhanced U-Net
    Agarwal, Rashi; IEEE International Conference on Ambient Intelligence, Knowledge Informatics and Industrial Electronics (AIKIIE) 2024

10. Comprehensive Survey on AQI Prediction Using Machine Learning Algorithms.
    Khan, I., Agarwal, R. (2024). In: Roy, B.K., Chaturvedi, A., Tsaban, B., Hasan, S.U. (eds) Cryptology and Network Security with Machine Learning. ICCNSML 2022. Algorithms for Intelligent Systems. Springer, Singapore. https://doi.org/10.1007/978-981-99-2229-1_32

11. Can ChatGPT help in the awareness of diabetes?
    Khan, Imran; Agarwal, Rashi; Annals of Biomedical Engineering, 51 (10), 2125-2129, 2023

12. Melanoma Detection in Dermoscopic Images Using an Ensemble of Improved EfficientNet Models.
    Kumar, H., Tripathi, S., Virmani, A., Malhotra, S.K., Agrawal, R. and Kumar, S., 2021. Design Engineering, pp.5628-5640.

13. Incorporating Requirement Engineering into Agile Methodologies: Challenges and Proposed Solutions
    Srivastava, Prateek; Srivastava, Nidhi; Agarwal, Rashi; Singh, Pawan; 2023 9th International Conference on Signal Processing and Communication (ICSC),351-355,2023

14. Integrated learning algorithms-based epileptologist assistive tool for seizure detection and prediction
    SR Sree, R Agarwal, S Markkandan, S Mubeen, MA Wakchaure
    Soft Computing, 1-10, 2023

15. Diagnosis of COVID-19 Using Deep Learning Augmented with Contour Detection on X-rays
    R Agarwal, S Hariharan
    Computer Vision and Machine Intelligence: Proceedings of CVMI 2022, 191-204

16. CasEnc: An Information Retrieval and Ranking System based on Cascaded Encoders
    N Sharma, R Agarwal, N Kohli, S Jain
    Scandinavian Journal of Information Systems 34 (2), 286-301,2022

17. Estimation in Agile Software Development Using Artificial Intelligence
    Srivastava, Prateek; Srivastava, Nidhi; Agarwal, Rashi; Singh, Pawan;
    Proceedings of Trends in Electronics and Health Informatics, Springer, Singapore, 2022,83-93

18. Software development estimation using soft computing techniques
    P Srivastava, N Srivastava, R Agarwal, P Singh, 2023
    Emerging Trends in IoT and Computing Technologies, 321-325

19. Minimum relevant features to obtain ai explainable system for predicting breast cancer in WDBC
    R Agarwal, M Revanth,2023
    International Journal of Health Sciences 6 (!X)

20. Human Disease Prognosis and Diagnosis Using Machine Learning
    S Kumar, H Kumar, R Agarwal, VK Patha,2023

Emerging Technologies for Computing, Communication and Smart Cities

21. Identifying highly vulnerable mosquito breeding sites using machine learning and drone based aerial survey
Shyam Sundhar V., Selvan V. N , S. Sanjeevi Prasad, Rashi Agarwal;
International Journal of Health Sciences, Universidad Técnica de Manabí (UTM), Vol 6, No. S3, 2022,209-221

22. Human Disease Prognosis and Diagnosis Using Machine Learning
Kumar, Sunil; Kumar, Harish; Agarwal, Rashi;
Emerging Technologies for Computing, Communication and Smart Cities,Springer, Singapore, 2022 ,41-53

23. Weed Identification using K-Means Clustering with Color Spaces Features in Multi-Spectral Images Taken by UAV

Rashi Agarwal, S Hariharan, M Nagabhushana Rao, Abhishek Agarwal2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS, 2021,7047-7050

24. A Systematic Literature Review on Software Development Estimation Techniques

Prateek Srivastava, Nidhi Srivastava, Rashi Agarwal, Pawan Singh
Second International Conference on Sustainable Technologies for Computational Intelligence (Springer, Singapore),2022, 119-134

25. Deep Learning augmented with Contour Detection Designed for Diagnosis of COVID-19 in X-rays
Rashi Agarwal, HariHaran S.
Design Engineering(Toronto), 2021,9(1),10445-10461

26. Transfer Learning and Supervised Machine Learning Approach for Detection of Skin Cancer: Performance Analysis and Comparison
Sunil Kumar Hemant Kumar, Amit Virmani, Shivneet Tripathi, Rashi Agrawal
Drugs and Cell Therapies in Haematology, 2021, 10(1)

27. Decision Support System designed to detect yellow mosaic in Pigeon pea using Computer Vision
Rashi Agarwal, Abhishek Agarwal
Design Engineering(Toronto, 2021, 8(1), 832-844

28. Audio-Visual Emotion Recognition System Using Multi-Modal Features
Handa, A., Agarwal, R., Kohli, N.
International Journal of Cognitive Informatics and Natural Intelligence, 2021, 15(4), oa34

29. Facial expression recognition using local multidirectional score pattern descriptor and modified hidden Markov model

Rahul, M., Kohli, N., Agarwal, R.
International Journal of Advanced Intelligence Paradigms, 2021, 18(4), pp. 538–551

30. Incremental approach for multi-modal face expression recognition system using deep neural networks

Handa, A., Agarwal, R., Kohli, N.
International Journal of Computational Vision and Robotics, 2021, 11(1), pp. 1–20

31. A multimodel keyword spotting system based on lip movement and speech features
    A Handa, R Agarwal, N Kohli
    Multimedia Tools and Applications, 1-21

32. A Comprehensive Video Dataset for Multi-Modal Recognition Systems
    A Handa, R Agarwal, N Kohli
    Data Science Journal 18 (1)

33. Layered Recognition Scheme for Robust Human Facial Expression Recognition using modified Hidden Markov Model
    M Rahul, R Agrawal, N Kohli, K
    Journal of Multimedia Processing and Technologies 10 (1), 18-26

34. An efficient technique for facial expression recognition using multistage hidden Markov model
    M Rahul, P Mamoria, N Kohli, R Agrawal
    Soft Computing: Theories and Applications, 33-43

35. Facial Expression Recognition Using Multistage Hidden Markov Model.
    M Rahul, N Kohli, R Agarwal
    Journal of Theoretical & Applied Information Technology 95 (23)

36. Review of features and machine learning techniques for web searching
    N Sharma, R Agarwal, N Kohli
    2016 11th International Conference on Industrial and Information Systems

37. A survey of face recognition techniques and comparative study of various bi-modal and multi-modal techniques
    A Handa, R Agarwal, N Kohli
    2016 11th International Conference on Industrial and Information Systems

38. *An efficient technique for facial expression recognition using multistage hidden Markov model*
    M Rahul, P Mamoria, N Kohli, R Agrawal
    Soft Computing: Theories and Applications, 33-43

39. *Facial Expression Recognition using Moments Invariants and Modified Hidden Markov Model*
    M Rahul, N Kohli, R Agarwal
    International Journal of Applied Engineering Research 13 (8), 6081-6088

40. *Facial Expression Recognition Using Multistage Hidden Markov Model.*
    M Rahul, N Kohli, R Agarwal
    Journal of Theoretical & Applied Information Technology 95 (23)

41. *Review of features and machine learning techniques for web searching*
    N Sharma, R Agarwal, N Kohli
    2016 11th International Conference on Industrial and Information Systems ...

42. *A Review and a Comparative Study of Various Plant Recognition and Classification Techniques*

using Leaf Images
A Handa, R Agarwal
International Journal of Computer Applications 123 (2), 20-25

43. *Modified Bit-Planes Sobel Operator: A New Approach to Edge Detection*
    R Agarwal
    International Journal of Computer Applications 117 (7), 9-15

44. *Remote Sensing Methods For Land Cover Assessment Case Study of Jharia Coal Field*
    R Agarwal
    International Journal of Applied Engineering Research 10 (1), 345

45. *Edge Detection in Images Using Modified Bit-Planes Sobel Operator*
    R Agarwal
    Proceedings of the Third International Conference on Soft Computing for …

46. *Edge Preserving BIT-Plane Adaptive Wiener Filter for Gaussian Noise Restoration*
    R Agarwal
    International Journal of Computer Applications 108 (12), 28-31

47. Bit plane average filtering to remove Gaussian noise from high-contrast images
    R Agarwal
    2012 International Conference on Computer Communication and Informatics, 1-5

48. Bit planes histogram equalization for tone mapping of high contrast images
    R Agarwal
    2011 Eighth International Conference Computer Graphics, Imaging and …

49. Removal of Gaussian Noise from high contrast images using Bit Plane Average Filter
    R Agarwal
    IEEE proceedings of First International conference on Signal, Image and

50. Estimation of Evapotranspiration and Its Correlation with Weather Parameters Using Remote Sensing
    R Agarwal
    International Journal of Applied 5 (2), 151-162

51. Detection of coal mine fires in the Jharia coal field using NOAA/AVHRR data
    R Agarwal, D Singh, DS Chauhan, KP Singh
    Journal of Geophysics and Engineering, Volume 3, Issue 3, September 2006, Pages 212– 218,

52. *Remote Sensing Methods For Land Cover Assessment: Case Study Of Jharia Coal Field*
    Agarwal Rashi, Singh D., Chauhan D.S., Singh K.P.
    Indonesian Journal of Remote Sensing 24 (2006) 25.

53. *Potential Of Noaa/Avhrr Data To Detect The Coal Mine Fires: A Case Study Of Jharia Region In India.*
    Agarwal Rashi, Singh D., Chauhan D.S., Singh K.P.
    Photogrammetric Journal of Finland. 26.

54. *Burned Surface Detection Using Noaa/Avhrr Vegetation Indices For Jharia Coalfield*

Agarwal Rashi, Singh D., Chauhan D.S., Singh K.P.
Proceedings 10th ASCE Aerospace Division International Conference on Engineering, Construction and Operations in Challenging Environments (Earth and Space 2006) held in League City/Houston, TX, U.S.A. during March 05-08, 2006. 27.

55. *Detection Of Coal Fire In Jharia Coal Field Using Noaa/Avhrr Data.*

    Agarwal Rashi, Singh D., Chauhan D.S., Singh K.P.
    Proceedings Earth System Processes Related To Earthquakes, Tsunamis And Volcanic Eruptions ,42nd Conference by Indian Geophysical Union, Hyderabad, on 8th /9th December, 2005. 28.

56. *Identification Of Cloudy Pixels Using Noaa-Avhrr Data*
    Agarwal Rashi, Singh D., Chauhan D.S., Singh K.P.
    IASTA Bulletin, International Conference on Aerosols, Clouds and Indian Monsoon IIT-K , Nov 15-17, 2004,pp 370-373. 29.

57. Burned Surface Detection Using Noaa/Avhrr Vegetation Indices For Jharia Coalfield
    Agarwal Rashi, Singh D., Chauhan D.S., Singh K.P.
    Conference at IT - BHU, proceedings Electro 2005, Emerging Trends in Electronics, Feb 3- 5,2005, pp 31-33. 30.

58. *Burned Surface Detection Using Vegetation Indices*
    Agarwal Rashi, Singh D., Chauhan D.S., Singh K.P.
    International Seminar on Coal Science and Technology -Emerging Global Dimensions organized by CFRI and CMRI, New Delhi

CONTRIBUTION TO RELEVANT AREAS OF HIGHER EDUCATION

- Mentor of Change: ATAL INNOVATION MISSION , Niti Ayog
- Expert, HBTU, Kanpur: Appointment of Lecturers
- Expert IIPR (ICAR),Kanpur: Appointment of Young Professionals/ Research Associates. Expert AITH, Kanpur, Appointment of Lecturers
- Expert KIT, Kanpur: Appointment of Lecturers
- Expert CSJM University, Kanpur: Approval of Colleges
- Member CSJM University: Approval of courses
- Expert, BOS AKTU (formerly UPTU) for B.Tech ECE and CSE.
- Expert, RDC Bundellkhand University, Jhansi: Approval of research scholars synopsis
- Expert, RDC Jaypee University, Guna,: PhD Viva Voice 2020
- Convener/Member CSJM University: Approval of courses and various BOS(MCA/BCA/IT/CSE
- Expert, BOS AKTU (formerly UPTU) for B.Tech ECE and CSE.
- Expert, RDC Bundelkhand University, Jhansi: Approval of research scholars, research guides.

RESEARCH PROJECTS/ CONSULTATION

IEEE High School Outreach Grant

A grant of $3900 has been sanctioned in December 2024 for Young Researcher program of my startup

Lohia Mechatronics

Corporate Training and Development of software for "Detection of faults in plastic films using 4k camera" as consultation for Rs. 50,000/- in 2021.

U.P. Council of Agricultural Research

Study and Development of Application for detection of crop diseases using image processing. (12/6/2014 onwards for 3 years) Duration:3 years, Rs. 15.60226 Lacs

U.P. Government of Higher Education

Center of Excellence Establishment for Rs. 3,00,000.00, sanctioned vide Gov. UP No 23/2021/442/SATTAR-4-2021-04(2)/2021, Dated 17 February, 2021 for a period of one year. (completed)

U.P. Government of Higher Education

Use of Artificial Intelligence for Lung Cancer Diagnosis Using X-Ray and CT scan (2021-24) for Rs. 2,93,200/- vide letter no. -94/2021/2173/sattar-4-2021-4(28)/2021 dated 22 October, 2021. (Retracted by me as I changed the institution)

CV Raman Grants CSJMU

IoT Based Air Pollution/Quality Monitoring on Thingspeak for Rs. 1,00,000/- vide letter no. CSJMU/R&D/CVR/25/2022 dated 07 February, 2022. (Retracted by me as I changed the institution)

RESEARCH SUPERVISOR/ GUIDE ASSIGNMENTS

09 PhD candidates 2 awarded, 7 pursuing

JRF 01 from UPCAR project

MEMBERSHIP/ FELLOWSHIP OF PROFESSIONAL BODIES

Life Member Institution of Electronics and Telecommunication Engineers

Member IEEE Society

TRAININGS/ CERTIFICATES

Year	Course Name	University	Grade Achieved
2022	Verified Certificate Fundamentals of TinyML	HarvardX	92%
2022	Verified Certificate Applications of TinyML	HarvardX	94%
2022	Verified Certificate Deploying TinyML	HarvardX	92%
2021	Fundamental Neuroscience for Neuroimaging	Johns Hopkins University (Coursera)	97.61%
2021	Neural Networks and Deep Learning	DeepLearning.AI (Coursera)	97.80%
2020	Deep Learning with TensorFlow 2.0 Certification	Edureka (Online)	N.A.
2015	Data Science Certification Training	Edureka (Online)	N.A.
2014	Certificate in Image Processing	Duke University (online on Coursera)	80%
2013	Google Apps 100 Certification	NA	NA
2011	Certificate in Python Programming	University of Toronto,(Coursera)	90%