Faculty Profile on University Website

www.mjpru.ac.in

Title	Dr.	First Name	Brajesh	Last Name	Kumar	Photograph
Designation		**Associate Professor**				
Department						
Address (Campus)		First Floor, University Computer Centre MJP Rohilkhand University Bareilly-243006.				
(Residence)						
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Educational Qualifications (Graduation Onwards)

Course/Degree	Institution	Year	Details/Thesis Topic/Subjects
PhD	Indian Institute of Technology Kanpur, Kanpur	2017	*Thesis title:* Spectral-spatial classification of hyperspectral imagery
MTech (Computer Sc. & Tech.)	Indian Institute of Technology Roorkee, Roorkee	2001	*Thesis title:* Path Rerouting Schemes for Wireless ATM Networks
MSc (Physics)	C.C.S. University, Meerut	1998	*Specialization:* Electronics
BSc	C.C.S. University, Meerut	1996	-

Career Profile

Organization / Institution	Designation	Duration	Role
Department of Computer Science & IT MJP Rohilkhand University, Bareilly	Associate Professor	Aug 2011-Onwards	Academic
Directorate of Research MJP Rohilkhand University, Bareilly	Associate Director	Oct 2020-Onwards	Academic
Department of Computer Science & IT MJP Rohilkhand University, Bareilly	Reader	Aug 2008-Aug 2011	Academic
Department of Computer Science & IT MJP Rohilkhand University, Bareilly	Lecturer	Oct 2002-Aug 2008	Academic

Research Interests / Specialization

The major interests of research include image processing, machine learning, and parallel computing with a special focus on remote sensing and medical imaging. Hyperspectral image classification is one of my most recent research efforts. It includes the integration of spectral and spatial information for better classification accuracy. It is achieved either by post classification refinement or by combined spectral-spatial feature set. However due to large data volume and complex algorithms such classification methods are sometimes computationally expensive. To alleviate the higher execution time parallel implementation of such methods is done on GPUs. The ongoing work also includes the use of image processing and machine learning techniques in

the field of precision agriculture and water research. The objectives include development of methods for automatic detection and diagnosis of plant diseases and prediction of phenotyping traits. Another research interests aims at developing algorithms for the assessment of water quality using remote sensing data.

Teaching Experience (Subjects/Courses Taught)

Honors & Awards

- **TEQIP-II Travel Grant** to visit Prague, Czech Republic to present paper at **2016** ISPRS Congress.
- **Institute Travel Grant** by IIT Kanpur to visit Lausanne, Switzerland to present research paper at JURSE-2015.
- **QIP Fellowship** to pursue PhD at IIT Kanpur.
- **MHRD Fellowship** (GATE) to pursue MTech at IIT Roorkee.

Publications /Academic Activities (Numbers Only)

Books & Monographs (Single Author)	**2**	**Research Papers Published in International Journals**	**28**	**Papers Presented in Seminars/ Conferences**	**15**	**Seminars/ Conferences Organized**	**4**	**Research Projects (Completed)**	**2**
Books (Co-authored)		**Research Papers Published in Other Journals**	**6**	**Seminar/ Conferences Attended**	**15**	**Workshops Organized**		**Research Projects (Ongoing)**	**5**
Books (Edited)	**3**	**Articles Published in Popular Fora, e.g., Websites, Blogs, Newspapers, Magazines etc.**		**Sessions Chaired in Seminars/ Conferences**	2	**Membership of Academic/ Professional Bodies**	2	**Foreign Countries Visited for Academic Assignments**	2
Chapters in Edited Books				**Resource Lectures Delivered**	6				

Details of Publications /Academic Activities (2010 Onwards)

(a) Books / Monographs

Year of Publication	Title	Publisher	ISBN	Co-Author (s) (if any)

(b) Recent Publication in SCI/Scopus Journals

Publications in SCI Listed Journals

1. Kumar, P., Kumar, B., and Kumar, S. (2025). Theoretical insights into the h-NbN monolayer for selective and moisture-resistant gas sensing: an ab initio study. Electronic Structure.
2. Kumar, P., Kumar, Singh, H. K., B., and Kumar, S. (2025). First-principles investigation of stanene-based toxic gas sensors: Coupled electrical and optical sensitivities. Solid State Communications.
3. Mohan, S., **Kumar, B.,** & Nejadhasemi, P. A. (2025). Integration of Machine Learning and Remote Sensing for Water Quality Monitoring and Prediction: A Review. *Sustainability*, 17, 998.
4. Pankaj, **Kumar, B.**, Bharti, P. K., Vishnoi, V. K., Kumar, K., Mohan, S., & Singh, K. P. (2024). Paddy yield prediction based on 2D images of rice panicles using regression techniques. *The Visual Computer*, 40, 4457-4471.

5. Vishnoi, V. K., Kumar, K., **Kumar, B.**, Mohan, S., & Khan, A. A. (2022). Detection of apple plant diseases using leaf images through convolutional neural network. *IEEE Access*, *11*, 6594-6609.
6. Pankaj, Bharti, P. K., & **Kumar, B.** (2023). A new design of occlusion-invariant face recognition using optimal pattern extraction and CNN with GRU-based architecture. *International Journal of Image and Graphics*, *23*(04), 2350029.
7. Pradhan, P., **Kumar, B.**, & Mohan, S. (2022). Comparison of various deep convolutional neural network models to discriminate apple leaf diseases using transfer learning. *Journal of Plant Diseases and Protection*, *129*(6), 1461-1473.
8. Singh, M. K., Mohan, S., & **Kumar, B.** (2022). Fusion of hyperspectral and LiDAR data using sparse stacked autoencoder for land cover classification with 3D-2D convolutional neural network. *Journal of Applied Remote Sensing*, *16*(3), 034523-034523.
9. Vishnoi, V. K., Kumar, K., & **Kumar, B.** (2022). A comprehensive study of feature extraction techniques for plant leaf disease detection. *Multimedia Tools and Applications*, *81*(1), 367-419.
10. Singh, M. K., Mohan, S., & **Kumar, B.** (2021). Hyperspectral image classification using deep convolutional neural network and stochastic relaxation labeling. *Journal of Applied Remote Sensing*, *15*(4), 042612-042612.
11. Vishnoi, V. K., Kumar, K., & **Kumar, B.** (2021). Plant disease detection using computational intelligence and image processing. *Journal of Plant Diseases and Protection*, *128*, 19-53.
12. **Kumar, B.** (2020). Hyperspectral image classification using three-dimensional geometric moments. *IET Image Processing*, *14*(10), 2175-2186.
13. **Kumar, B.**, Dikshit, O., Gupta, A., & Singh, M. K. (2020). Feature extraction for hyperspectral image classification: A review. International Journal of Remote Sensing, 41(16), 6248-6287.
14. **Kumar, B.** & Dikshit, O. (2017). Hyperspectral Image Classification Based on Morphological Profiles and Decision Fusion. *International Journal of Remote Sensing*, 38(20), 5830-5854.
15. **Kumar, B.** & Dikshit, O. (2017). Spectral Contextual Classification of Hyperspectral Imagery with Probabilistic Relaxation Labelling. *IEEE Transactions on Cybernetics*, 47(12), 4380-4391.
16. **Kumar, B.** & Dikshit, O. (2016). Parallel probabilistic relaxation labelling based on Markov random fields for spectral-spatial hyperspectral image classification. *International Journal of Remote Sensing*, 37(18), 4356-4379.
17. **Kumar, B.** & Dikshit, O. (2015). Spectral-spatial classification of hyperspectral imagery based on moment invariants. *IEEE Journal on Selected Topics in Applied Earth Observations and Remote Sensing*, 8(6), 2457-2463.

Publications in SCOPUS Journals

1. Singh, S., Kumar, K., & **Kumar, B.** (2024). Analysis of feature extraction techniques for sentiment analysis of tweets. *Turkish Journal of Engineering*, 8 (4), 741-753.
2. Vishnoi, V. K., Kumar, K., **Kumar, B.**, & Bhutiani, R. (2024). A stacking ensemble

machine learning based approach for classification of plant diseases through leaf images. *Environment Conservation Journal*, 767-778.

3. Pradhan, P., **Kumar, B.**, Kumar, K., & Bhutiani, R. (2024). Plant disease detection using leaf images and an involutional neural network. *Environment Conservation Journal*, 452-462.
4. Pankaj, Bharti, P. K., & **Kumar, B.** (2023). A new design of occlusion-invariant face recognition using optimal pattern extraction and CNN with GRU-based architecture. International Journal of Image and Graphics, 23 (04), 2350029.
5. Husain, A., **Kumar**, **B.**, and Doegar, A. (2010). Performance evaluation of routing protocols in wireless adhoc networks. *International Journal of Internet Protocol Technology*, 6 (1⁄2), 38-45.

Publications in Other Peer Reviewed Journals

1. Kumar, P. Doegar, A. & **Kumar, B.** (2016). Impact of Mobility on Energy Consumption of AODV Protocol for Routing in Mobile Ad Hoc Networks. *International Journal of Computer Applications*, 152 (9), 14-17.
2. Kumar, P. **Kumar, B.** & Doegar, A. (2016) Impact of Mobility on Energy Consumption of DSR Protocol for Routing in Mobile Ad Hoc Networks. *International Journal of Engineering Research and Management*, 3 (9), 67-69
3. Hrudya KP, **Kumar, B.** & Gupta, P. (2013). Impact of Mobility on Different Routing Approaches in MANETs. *International Journal of Computer Applications*, 63 (23), 18-22.
4. Singh, M. K., **Kumar**, **B.**, Kumar, C., & Gupta, M. (2011). Preemptive Multipath Adhoc on Demand Distance Vector Routing Protocol. *MIT International Journal of Computer Science and Information Technology*, 1 (1), 36-40.
5. Bisht, A. K., **Kumar, B.**, Mishra, S., Husain, A. (2011). Simulation Based Analysis of Position Based Routing Protocols in Vehicular Ad hoc Networks. *International journal of Advances in Computer Networks and its Security*, 1, 192-202.
6. Husain, A., **Kumar, B.,** and Doegar, A. (2010). A Study of location aided routing (LAR) protocol for vehicular adhoc networks in highway scenario. *International Journal of Engineering & Information Technology*, 2 (2), 118-124.

(c) Articles

(d) Seminar/Conference Presentations

1. Singh, M. K., & **Kumar, B**. (2023). Fine Tuning the Pre-Trained Convolutional Neural Network Models for Hyperspectral Image Classification Using Transfer Learning. In Computer Vision and Robotics: Proceedings of CVR 2022 (pp. 271-283). Singapore: Springer Nature Singapore.
2. Singh, M. K., & **Kumar, B.** (2022, November). A Comparative Study of Different Convolution Neural Network Architectures for Hyperspectral Image Classification. In 2022 7th International Conference on Computing, Communication and Security

(ICCCS) (pp. 1-6). IEEE.

3. Lama, A., Vishnoi, V. K., Kumar, K., **Kumar, B.**, & Saini, A. (2022, November). E-waste, a Global Challenge: Its Management and Impact on Public Health in India. In 2022 International Conference on Fourth Industrial Revolution Based Technology and Practices (ICFIRTP) (pp. 25-29). IEEE.
4. Pradhan, P., & **Kumar, B.** (2022, May). Automatic detection of tomato diseases using fine-tuned pre-trained deep learning models. In 2022 3rd international conference for emerging technology (INCET) (pp. 1-5). IEEE.
5. Singh, S., Kumar, K., & **Kumar, B.** (2022, May). Sentiment analysis of Twitter data using TF-IDF and machine learning techniques. In 2022 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (COM-IT-CON) (Vol. 1, pp. 252-255). IEEE.
6. Vishnoi, V. K., Kumar, K., & **Kumar, B.** (2021, December). Crop disease classification through image processing and machine learning techniques using leaf images. In 2021 First International Conference on Advances in Computing and Future Communication Technologies (ICACFCT) (pp. 27-32). IEEE.
7. Pradhan, P., & **Kumar, B.** (2021, December). Tomato leaf disease detection and classification based on deep convolutional neural networks. In 2021 First International Conference on Advances in Computing and Future Communication Technologies (ICACFCT) (pp. 13-17). IEEE.
8. Tripathi, A. M., Upadhyay, A., Rajput, A. S., Singh, A. P., & **Kumar, B.** (2017, March). Automatic detection of fracture in femur bones using image processing. In 2017 international conference on innovations in information, embedded and communication systems (ICIIECS) (pp. 1-5). IEEE.
9. **Kumar, B.**, & Dikshit, O. (2016). Parallel Implementation of Morphological Profile Based Spectral-Spatial Classification Scheme for Hyperspectral Imagery. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 41, 263-267.
10. **Kumar, B.**, & Dikshit, O. (2015, March). Integrating spectral and textural features for urban land cover classification with hyperspectral data. In 2015 Joint Urban Remote Sensing Event (JURSE) (pp. 1-4). IEEE.
11. **Kumar, B.**, & Dikshit, O. (2014). Texture based hyperspectral image classification. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 40, 793-798.
12. Prabhakaran, H. K., **Kumar, B.**, & Gupta, P. (2013, March). Performance evaluation of manet routing protocols under rpgm model by varying transmission range. In 2013 International Mutli-Conference on Automation, Computing, Communication, Control and Compressed Sensing (iMac4s) (pp. 823-826). IEEE.
13. Bisht, A. K., **Kumar, B.**, & Mishra, S. (2012, January). Efficiency evaluation of routing protocols for Vehicular Ad-Hoc Networks using city scenario. In 2012 International Conference on Computer Communication and Informatics (pp. 1-7). IEEE.
14. Husain, A., Raw, R. S., **Kumar, B.**, & Doegar, A. (2011). Performance comparison of different routing protocols in vehicular network environments. In Advances in Computing and Information Technology: First International Conference, ACITY 2011, Chennai, India, July 15-17, 2011. Proceedings (pp. 427-436). Springer Berlin

Heidelberg.

15. Prakash, V., Kumar, B., & Srivastava, A. K. (2011, February). Energy efficiency comparison of some topology-based and location-based mobile ad hoc routing protocols. In Proceedings of the 2011 International Conference on Communication, Computing & Security (pp. 36-39).

(e) Resource Lectures Delivered

1

(f) Seminars/Conferences/Workshops Organized

(g) Public Service / University Service / Consulting Activity

(h) Memberships of Academic/Professional Bodies

1. Senior Member, IEEE
2. Life Member, Indian Science Congress

Projects (With Title, Year, Grants, Funding Agency and Collaborations)

Projects Ongoing:

Title	Year	Grant (Rs)	Funding Agency
Electron-Phonon Coupling Effects on Thermoelectrics Performance of High Entropy Alloys Based on Heusler Compounds: First-principles Insight	(2024-2027)	Rs. 40.41 Lakh	SERB-DST Govt. of India
HyImC: A python-based software package for hyperspectral image classification using deep learning frameworks.	(2024-2027)	Rs. 24.22 Lakh	SERB-DST Govt. of India
Crop Health Monitoring Using Machine Learning.	(2022- 2025)	Rs. 6 Lakh	Govt. of UP
Atal Centre for Artificial Intelligence	(2022-2025)	Rs. 21.5 Lakh	Govt. of UP
Smart Organic Agriculture (SOA): Modeling of Artificial Intelligence based IoT framework for Crop Recommendation & Supply Chain Management using	(2023-2026)	Rs. 9.0 Lakh	UP CST

Blockchain.			
Plant Disease Identification Using Computer Techniques.	(2021-2024)	Rs. 6 Lakh	Govt. of UP

Projects Completed

Title	Funding Agency	Grant
Integration of Spectral and Spatial Information for Hyperspectral Image Classification.	ISRO	Rs. 22.35 Lakh
Feature extraction for hyperspectral image Classification.	TEQIP-III	Rs. 2 Lakh

Administrative Positions/Assignments Held

Organization / Institution	Designation	Duration
University Computer Centre MJP Rohilkhand University, Bareilly	Coordinator	July 2023-Onwards
Atal Centre for Artificial Intelligence MJP Rohilkhand University, Bareilly	Coordinator	Oct 2020-Onwards
DigiShakti MJP Rohilkhand University, Bareilly	Deputy Nodal Officer	July 2022-October 2024
National Service Scheme MJP Rohilkhand University, Bareilly	Program Officer	Oct 2020-Dec 2023
Department of Computer Science & IT MJP Rohilkhand University, Bareilly	Head of Department	Aug 2017-Aug 2020
Department of Computer Science & IT MJP Rohilkhand University, Bareilly	Head of Department	Jul 2011-Jul 2012
Boar of Studies Department of Computer Science & IT MJP Rohilkhand University, Bareilly	Convenor	Aug 2010-Jul 2012

Academic Foreign Visits

1. EPFL, Lussane, Switzer;and, 2014
2. University of Charles, Prague, 2016

Any Other Details

Signature of Faculty Member
(in Hard Copy Only)

Note: Please submit this file to E-mail ID: rkg@mjpru.ac.in through your own E-mail ID.