

Dr. Haider Banka

Associate Professor, Department of Computer Science & Engineering, IIT (ISM), Dhanbad

Contact Information	Education	Research Interests	Experience	Awards & Achievements	Scientific Research
Patent	Administrative Support Work	Short Term Courses	Organizing Participation Training Workshops	Membership in Professional Bodies	Seminars and Invited Talks
Training Courses Attended	Practicing Activities	Ph.D. Supervision	Books Published	Selected Journal Publications	Selected Conferences Papers and Book Chapters

Contact Information

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Education

Institution	Degree	Duration
Jadavpur University, West Bengal, India	Ph.D., Computer Science & Engineering	2006-2008
University of Calcutta, West Bengal, India	M.Tech., Computer Science & Engineering	2001-2003
University of Calcutta, West Bengal, India	M.Sc. & B.Sc. in Computer Science	1996-2001
WB Council Board for Secondary Education	Secondary & Higher Secondary Certificates	1991-1995

Research Interests

- Soft Computing
- Machine Learning
- Data Mining
- Nature-Inspired Computing
- Artificial Neural Networks
- Fuzzy Logic & Rough Sets

Experience

Teaching Experience

Role	Institution	Duration	Duration (Years)
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Lecturer & Sr. Lecturer	Dr. BCROY Engineering College, WB	15/01/2003 - 31/03/2004	1 year, 2 months
Assistant Professor	IIT (ISM), Dhanbad	03/12/2007 - 21/05/2013	5 years, 9 months
Associate Professor	IIT (ISM), Dhanbad	22/05/2013 - Present	11+ years

Research Experience

Role	Institution	Duration	Duration (Years)
Senior Research Fellow	MIU, ISI Kolkata	14/04/2004 - 31/03/2006	2 years
Research Associate	DISI, Univ. of Geneva, Italy	05/04/2007 - 05/07/2007	3 months
Visiting Researcher	CSCR, ISI Kolkata	31/06/2006 - 31/08/2007	1 year, 2 months
Visiting Assistant Professor	CSCR, ISI Kolkata	30/08/2007 - 30/11/2007	3 months

Awards & Achievements

- **EU-INDIA Fellowship**, DISI, University of Genova, Italy (April 2006 - July 2006)
- **Visiting Research Fellowship**, CSCR, ISI Kolkata, funded by DST (July 2006 - August 2007)

Scientific Research

- **CSIR Project:** Design of Machine Learning Techniques for Specialized Biological Online Database-Mining.
Project No: CSIR(11)/2012-2013/314/CSE
Sanctioned Amount: Rs. 16,05,000.00/-
Duration: 2012-2015
Role: Principal Investigator
- **DRDO Project:** Energy Efficient Intruder Detection Schemes for WSN using Learning-Based Techniques.
Project No: DRDO (2)/2015-2016/431/CSE
Sanctioned Amount: Rs. 28,52,000.00/-
Duration: 2015-2018
Role: Co-Principal Investigator
- **Distributed Cognitive System for Healthcare:**
Funding Agency: MeltY
Sanctioned Amount: Rs. 20,00,000.00/-
Duration: 2021-2023
Role: Principal Investigator
- **AI for Fire Prediction in Open Cast Mines:** Developing AI-based machine learning solutions for predicting fire in mines.
Funding Agency: CIL (CMPDI)
Sanctioned Amount: Rs. 25,99,000.00/-
Duration: 2021-2023
Role: Principal Investigator
- **AI-Based Integrated System for Copper Exploration Targeting:**
Funding Agency: TEXMIN, DST
Sanctioned Amount: Rs. 24,92,000.00/-

Duration: June 2023-May 2025

Role: Co-Principal Investigator

Patent

- **Coal Fire Prevention:** A practical approach for coal fire prevention and its prediction.
Inventors: Satish Kumar Sinha, D.C. Panigrahi, Haider Banka
Date: March 2015
Status: Granted
Patent Application No.: 305/KOL/2015
- **Automated Position and Latch Locking:** Control mechanism using mobile application.
Inventors: Srijan Varma, Prateek Kumar, Haider Banka
Date: March 2016
Status: Applied
Ref. No.: E-12/30/2016-KOL
Application No.: 201631007292

Administrative Support Work

- **Head of the Department (H.O.D),** 07/06/2018 to 12/06/2020
- **Member, DSC (Doctoral Scrutiny Committee),** 2012 to Present
- **BOCS Member,** 2013 to Present
- **Coordinator, 3-Year M.Tech. Program,** 2015 to Present
- **Member, House Allotment Committee,** May 2018 to August 2018
- **Coordinator for JRF,** 2015 to June 2018
- **Coordinator, TEQIP-II & TEQIP-III,** Oct 2013 to June 2018
- **Secretary, Department Advisory Committee,** 2008 to June 2018
- **Coordinator, International Exchange Program (Erasmus Mundus Euphrates),** 2014 to 2016
- **Time Table In-Charge,** 2009 to 2014
- **Tabulator of Examination,** 2009 to 2011

Short Term Courses

S.N.	Title	External Funding (Rs. Lakh)	Funding Agency	Role	No. of Co-CI	Duration	Status
1	Fundamentals of soft computing and its applications	1.95	SELF SPONSORED	CI	1	09-13 September 2015 No. of Participants: 51	Completed
2	Nature inspired computing and its applications	2.85	SELF SPONSORED	CI	1	08-12 February 2016 No. of Participants: 55	Completed
3	Network protocols and their simulation using ns-2/ns-3	2.05	SELF SPONSORED	CO-CI	1	19-23 August 2015	Completed
4	Network protocols & their simulations using ns2	1.5	SELF SPONSORED	CO-CI	1	09-13 September 2015	Completed

S.N.	Title	External Funding (Rs. Lakh)	Funding Agency	Role	No. of Co-CI	Duration	Status
5	Data modelling for artificial intelligence applications	0	SELF SPONSORED	CI	1	March 25-April 06, 2019	Completed
6	Digital Transformation for improving mine productivity and profitability	16.5	SELF SPONSORED	Co-CI	3	18th-19th October 2019	Completed
7	Training programme on Python Programming Language	0	Free Training	CI	1	03rd-07th December 2018	Completed

Organizing Participation Training Workshops

- Organized **First IEEE International Conference on Recent Advances in Information Technology (RAIT-12)**, March 2012, ISM Dhanbad.
- Organizing **Third IEEE International Conference on Recent Advances in Information Technology (RAIT-16)**, March 2016, ISM Dhanbad.
- Organized two Guest Lectures on **Ubiquitous Computing and Insights into Key Industries** and "How to tie-up your Coding Goal to Business Goal" on 19th January 2014 under TEQIP-II, Penman Auditorium, ISM Dhanbad (Coordinator).
- Organized Guest Lecture on **"How to work on Network Simulator"** under TEQIP-II at NLHC on 21st August 2015, ISM Dhanbad (Coordinator).
- Organized Short-Term Course on **"Ubiquitous Computing and Insights into Key Industries"** (CI), TEQIP-II Sponsored, 19th January 2014.

Membership in Professional Bodies

- IEEE Membership
- IAENG Membership (Life Member)
- Department of Information Science (DISI), University of Genoa, Italy

Seminars and Invited Talks

- Department of Information Science (DISI), University of Genoa, Italy, August, 2006
- Invited Talk on **National Seminar on Data Mining and Decision Support (DMDS)** (4-5 March, 2010), Computer Centre, Vidya Sagar University, Midnapore.
- Invited talk at **TIT Agartala** for Staff Development Program, 11-13 July, 2011
- Presentation at **DEXA, Austria, Vienna, (BIOKDD)**, 3-5 September, 2012
- Invited Talk on AICTE sponsored **Staff Development Programme on Soft Computing in Bioinformatics** (11-21 July, 2011) in Tripura Institute of Technology, Agartala, Tripura, 2011.
- Invited Talk on **Nature Inspired Computing**, Sponsored by UGC for National Seminar on Quantum Information Theory and Computer Science, Jogesh Chandra Chaudhuri College, Kolkata (14-15 February, 2012)
- Invited talk on **Faculty Development Program on Pattern Recognition and its Applications** sponsored by AICTE, 15th July, 2013
- Invited talk on **Data Warehousing** for the workshop during 23-25 September, 2013 at BCET, Odisha, India.
- Invited talk on **Improving Equipment Utilization by Applying Machine Intelligence**, 10 January, 2014 at IICM, Ranchi, India.
- Invited talk on **Soft Computing and Applications**, 5 March, 2014 at NIT Durgapur, India.
- Participated and presented papers in the **6th International Conference of the Association of the Asia Pacific Operational Research Societies (APORS 2003)**, New Delhi, 8-11 December, 2003
- Computers and Devices for Communication (CODEC-04)**
- Advanced Computing & Communication Technologies (ICACCT-2012)**
- DEXA 2012**, 3-5 September, 2012, Austria
- ICCRC 2011**, 21-23 March, 2011, New Delhi
- RAIT-2009**, 6-7 2009, ISM Dhanbad

Training Courses Attended

- Two weeks short term course on **Robotics and Automation** at IIT Kanpur, July 7-18, 2003
- Two days International workshop on **Algorithm (IWA)**, 15-16 December, 2005, Indian Statistical Institute, Kolkata
- 1 week Winter School on **Soft Computing Tools, Simulation and Applications**, 10-14 January, 2006, Centre for Soft Computing Research, Kolkata
- 1 week SERC School on **Advanced Software Engineering Techniques and Their Applications**, funded by DST, 4-8 June, 2012, NIT Rourkela
- 1 week course on **Programmable Logic Controller (PLC) Programming, Applications and Troubleshooting**, 04-09 October, 2013, ISM Dhanbad
- 2 days workshop on **Embedded System Design using MSP430 Micro-controller**, 14-15 February, 2014, ISM Dhanbad

Practicing Activities

- Coordinator, International Exchange Program (Erasmus Mundus Euphrates)
- Secretary, Departmental Advisory Committee (DAC) since 2008
- Departmental Coordinator, TEQIP-II Program, since 2013
- Co-coordinator of 3yrs. M. Tech. Course in CSE, for ISM Industry Institute Interaction Centre
- Faculty in charge for ISM JRFs Full time, since 2014
- Time Table In-charge, Dept. of CSE & Central Time Table committee (2008-2013)
- Tabulator of Examination, Manipulate/Prepare Results of B. Tech. & M. Tech. Examination (2009-2011)
- Member, Departmental Purchase Committee, 2012
- Reviewer of many International Journals (IEEE Trans. on SMC: Part A, B, C, Pattern Recognition, IJPRAI, PRL, ICPR, IJCNN, etc.)
- Member, ISM House Allotment Committee, since May, 2016

Ph.D. Supervision

16 Ph.D. Awarded

In addition, 02 Full-Time and 03 Part-Time Scholars are currently being guided.

Books Published

Title	Authors	Publisher	Year
Soft Computing for Machine Learning and Bioinformatics	Haider Banka	Verilog Dr. Muller Publication, Mauritius, Germany	2010
Feature Selection in High Dimensional Data Using Meta-Heuristic	H. Banka & Suresh Dara	Lambert Academic Publication	2017
Proceedings of the Third IEEE International Conference on Recent Advances in Information Technology (RAIT)	Dr. C. Kumar & Dr. H. Banka	Cygnus, India	2012
Proceedings of the First IEEE International Conference on Recent Advances in Information Technology (RAIT)	Dr. C. Kumar, Dr. H. Banka, and D. Ramesh	IEEE Xplore, India	2016

Selected Journal Publications

Sl. No	Authors	Article Title	Source Title	ISSN	eISSN	Publication Date	Publication Year	Volume	Issue	Start Page	End Page
1	Kumar, A.; Nadeem, M.	Nature inspired optimization	Evolving Systems	1868-6478	1868-6486	FEB 2023	2023	14	1	141	156

Sl. No	Authors	Article Title	Source Title	ISSN	eISSN	Publication Date	Publication Year	Volume	Issue	Start Page	End Page
	Banka, H	algorithms: a comprehensive overview									
2	Huda, RK; Banka, H	Efficient feature selection methods using PSO with fuzzy rough set as fitness function	Soft Computing	1432-7643	1433-7479	MAR 2022	2022	26	5	2501	2521
3	Rao, PCS; Lalwani, P; Banka, H; Rao, GSN	Competitive swarm optimization based unequal clustering and routing algorithms (CSO-UCRA) for wireless sensor networks	Multimedia Tools and Applications	1380-7501	1573-7721	JUL 2021	2021	80	17	26093	26119
4	Huda, RK; Banka, H	New efficient initialization and updating mechanisms in PSO for feature selection and classification	Neural Computing & Applications	0941-0643	1433-3058	APR 2020	2020	32	8	3283	3294
5	Mohindru, G; Mondal, K; Banka, H	Internet of Things and data analytics: A current review	Wiley Interdisciplinary Reviews-Data Mining and Knowledge Discovery	1942-4787	1942-4795	MAY 2020	2020	10	3	-	-
6	Singh, J; Banka, H; Verma, AK	A BBO-based algorithm for slope stability analysis by locating critical failure surface	Neural Computing & Applications	0941-0643 / 1433-3058	OCT 2019	2019	31	10	6401	6418	
7	Huda, RK; Banka, H	Efficient feature selection and classification algorithm based on PSO and rough sets	Neural Computing & Applications	0941-0643	1433-3058	AUG 2019	2019	31	8	4287	4303
8	Singh, J; Banka, H; Verma, AK	Locating critical failure surface using meta-	Arabian Journal of Geosciences	1866-7511	1866-7538	MAY 2019	2019	12	9	-	-

Sl. No	Authors	Article Title	Source Title	ISSN	eISSN	Publication Date	Publication Year	Volume	Issue	Start Page	End Page
		heuristic approaches; a comparative assessment									
9	Nadeem, M; Banka, H; Venugopal, R	Estimation of pellet size and strength of limestone and manganese concentrate using soft computing techniques	Applied Soft Computing	1568-4946	1872-9681	OCT 2017	2017	59	-	500	511
10	Rao, PCS; Banka, H	Novel chemical reaction optimization based unequal clustering and routing algorithms for wireless sensor networks	Wireless Networks	1022-0038	1572-8196	APR 2017	2017	23	3	759	778
11	Yadav, RK; Banka, H	An improved chemical reaction-based approach for multiple sequence alignment	Current Science	0011-3891	-	FEB 10 2017	2017	112	3	527	538
12	Rao, PCS; Banka, H	Energy efficient clustering algorithms for wireless sensor networks; novel chemical reaction optimization approach	Wireless Networks	1022-0038	1572-8196	FEB 2017	2017	23	2	433	452
13	Nadeem, M; Banka, H; Venugopal, R	SVM-Based Predictive Modelling of Wet Pelletization Using Experimental and GA-Based Synthetic Data	Arabian Journal for Science and Engineering	2193-567X	2191-4281	MAR 2016	2016	41	3	1053	1065

Sl. No	Authors	Article Title	Source Title	ISSN	eISSN	Publication Date	Publication Year	Volume	Issue	Start Page	End Page
14	Singh, J; Verma, AK; Banka, H; Singh, TN; Maheshwar, S	A study of soft computing models for prediction of longitudinal wave velocity	Arabian Journal of Geosciences	1866-7511	1866-7538	MAR 2016	2016	9	3	-	-
15	Banka, H; Ray, SK; Panigrahi, DC	Standardization of a method for studying susceptibility of Indian coals to self-heating	Arabian Journal of Geosciences	1866-7511	1866-7538	FEB 2016	2016	9	2	-	-
16	Annavarapu, CSR; Dara, S; Banka, H	CANCER MICROARRAY DATA FEATURE SELECTION USING MULTI-OBJECTIVE BINARY PARTICLE SWARM OPTIMIZATION ALGORITHM	EXCLI Journal	1611-2156	-	2016	15	-	460	473	
17	Banka, H; Dara, S	A Hamming distance based binary particle swarm optimization (HDBPSO) algorithm for high dimensional feature selection, classification and validation	Pattern Recognition Letters	0167-8655	1872-7344	JAN 15 2015	2015	52	-	94	100
18	Mitra, S; Das, R; Banka, H; Mukhopadhyay, S	Gene interaction - An evolutionary biclustering approach	Information Fusion	1566-2535	1872-6305	JUL 2009	2009	10	3	242	-
19	S. Mitra, H. Banka	Multi-objective evolutionary biclustering of gene expression data	Pattern Recognition	-	-	2006	39	-	246	247	

Sl. No	Authors	Article Title	Source Title	ISSN	eISSN	Publication Date	Publication Year	Volume	Issue	Start Page	End Page
20	S. Mitra, H. Banka, W. Pedrycz	Rough-fuzzy collaborative clustering	IEEE Transactions on Systems, Man, and Cybernetics, Part B	-	-	2006	36	-	795		

Selected Conferences Papers and Book Chapters

1. Mitra, Sushmita, Haider Banka, and Witold Pedrycz. "Collaborative rough clustering." In *International Conference on Pattern Recognition and Machine Intelligence*, pp. 768-773. Springer, Berlin, Heidelberg, 2005. [Book chapter]
2. Mitra, Sushmita, Haider Banka, and Sankar K. Pal. "A MOE framework for biclustering of microarray data." In *Pattern Recognition, 2006. ICPR 2006. 18th International Conference on*, vol. 1, pp. 1154-1157. IEEE, 2006.
3. Haider Banka, and Sushmita Mitra. "Soft Computing in Biclustering." *Introduction to Machine Learning and Bioinformatics* (2008): 277. [Book chapter]
4. Haider Banka and Suresh Dara. "Feature Selection and Classification for Gene Expression Data Using Evolutionary Computation." In *Database and Expert Systems Applications (DEXA), 2012 23rd International Workshop on*, pp. 185-189. IEEE, 2012.
5. Filippone, Maurizio, Francesco Masulli, Stefano Rovetta, Sushmita Mitra, and Haider Banka. "Possibilistic approach to biclustering: An application to oligonucleotide microarray data analysis." In *International Conference on Computational Methods in Systems Biology*, pp. 312-322. Springer, Berlin, Heidelberg, 2006. [Book chapter]
6. Das, Ranajit, Sushmita Mitra, Haider Banka, and Subhasis Mukhopadhyay. "Evolutionary biclustering with correlation for gene interaction networks." In *International Conference on Pattern Recognition and Machine Intelligence (PRMI)*, pp. 416-424. Springer, Berlin, Heidelberg, 2007.
7. Mitra, Sushmita, Haider Banka, and Jiaul Hoque Paik. "Evolutionary fuzzy biclustering of gene expression data." In *International Conference on Rough Sets and Knowledge Technology*, pp. 284-291. Springer, Berlin, Heidelberg, 2007. [Book chapter]
8. Haider Banka, and Sushmita Mitra. "Feature selection, classification and rule generation using rough sets." In *Rough Sets: Selected Methods and Applications in Management and Engineering*, pp. 51-76. Springer, London, 2012.
9. Rao, A. Chandra Sekhara, Durvasula VLN Somayajulu, and Haider Banka. "Modified correlation-based technique in microarray data analysis for searching differentially expressed genes." In *Recent Advances in Information Technology (RAIT), 2012 1st International Conference on*, pp. 526-530. IEEE, 2012.
10. Rao, A. Chandra Sekhara, D. V. L. N. Somayajulu, Haider Banka, and Rohit Chaturvedi. "Outlier detection in microarray data using hybrid evolutionary algorithm." *Procedia Technology* 6 (2012): 291-298. [Book chapter]
11. Dara, Suresh, and Haider Banka. "A binary PSO feature selection algorithm for gene expression data." *Advances in Communication and Computing Technologies (ICACACT), 2014 International Conference on*. IEEE, 2014. [Book chapter]
12. Dara, Suresh, and Haider Banka. "An Elitist Binary PSO Algorithm for Selecting Features in High Dimensional Data." *Advanced Computing, Networking and Informatics-Volume 1*. Springer International Publishing, 2014. 679-686.
13. Rao, PC Srinivasa, Haider Banka, and Prasanta K. Jana. "Energy Efficient Clustering for Wireless Sensor Networks: A Gravitational Search Algorithm." In *International Conference on Swarm, Evolutionary, and Memetic Computing*, pp. 247-259. Springer, Cham, 2015.
14. Rao, PC Srinivasa, Haider Banka, and Prasanta K. Jana. "A gravitational search algorithm for energy efficient multi-sink placement in wireless sensor networks." In *International conference on swarm, evolutionary, and memetic computing*, pp. 222-234. Springer, Cham, 2015.
15. Yadav, Rohit Kumar, and Haider Banka. "Genetic Algorithm with Improved Mutation Operator for Multiple Sequence Alignment." *Information Systems Design and Intelligent Applications*. Springer India, 2015. 515-523. [Book chapter]
16. P. CH Srinivas, H. Banka, and Prasanta K. Jana. "PSO-Based Multiple-sink Placement Algorithm for Prolonging the Lifetime of Wireless Sensor Networks." In *Proceedings of the Second International Conference on Computer and Communication Technologies*, pp. 605-616. Springer India, 2016.
17. Alam, Manaar, Soumyajit Chatterjee, and Haider Banka. "A novel parallel search technique for optimization." In *Recent Advances in Information Technology (RAIT), 2016 3rd International Conference on*, pp. 259-263. IEEE, 2016.
18. Seth, Himanshu Ranjan, and Haider Banka. "Hardware implementation of Naive Bayes classifier: A cost-effective technique." In *Recent Advances in Information Technology (RAIT), 2016 3rd International Conference on*, pp. 264-267. IEEE, 2016.
19. Singh, Jayraj, A. K. Verma, and Haider Banka. "Application of biogeography based optimization to locate critical slip surface in slope stability evaluation." In *2018 4th International Conference on Recent Advances in Information Technology (RAIT)*, pp. 1-5. IEEE, 2018.

20. Singh, Jayraj, Haider Banka, and A. K. Verma. "Analysis of slope stability and detection of critical failure surface using gravitational search algorithm." In *2018 4th International Conference on Recent Advances in Information Technology (RAIT)*, pp. 1-6. IEEE, 2018.
 21. Singh, Jayraj, A. K. Verma, and Haider Banka. "A Comparative Study for Locating Critical Failure Surface in Slope Stability Analysis via Meta-Heuristic Approach." In *Handbook of Research on Predictive Modeling and Optimization Methods in Science and Engineering*, pp. 1-18. IGI Global, 2018. [Book chapter]
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