



# Prof. Sharmistha Bhattacharya Halder

Professor, Department of Mathematics  
Tripura University (A Central University),  
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## EDUCATION

- **Ph.D in Mathematics**, Tripura University (A Central University), India
- **Master of Science (Applied Mathematics)**, Jadavpur University, India
- **Bachelor of Science**, M.B.B College, Tripura, India

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## Ph.D Thesis

**Title:**  $\delta$  Induced fuzzy topological space and topologies generated by generalized  $\delta$  open sets in fuzzy setting

**Ph.D Supervisor:** Prof. Anjan Mukherjee (Retired), Department of Mathematics, Tripura University

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## EXPERIENCE

**July 2016 till date**

**Professor, Dept. of Mathematics, Tripura University (A Central University), India**

**July 2013 - July 2016**

**Associate Professor, Dept. of Mathematics, Tripura University (A Central University), India**

**July 2010-July 2013**

**Reader, Dept. of Mathematics, Tripura University (A Central University), India**

**July 2004-July 2010**

**Lecturer, Dept. of Mathematics, Tripura University (A Central University), India**

**January 2004-July 2004**

**Assistant Professor, NS Mahavidyalaya, Udaipur, Tripura, India**

**January 2003-January 2004**

**PTCT: Polytechnique College, Narsingarh, Tripura, India**

January 2002-January 2003

PTCT: DDM College, Khowai, Tripura, India

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## RECENT FIELD OF INTEREST

Rough Set, Fuzzy Set, Image Processing (Face Detection), Data Mining, Topology, Numerical Analysis, Integral Equation, Operation Research

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## AWARDS

1. First Class in MSC: Jadavpur University
  2. First Class First: Gold Medalist in BSC (Honours), Tripura University, Tripura
  3. NET Qualified, June 2001
  4. NET Qualified December 2001
  5. First Division in Both Madhyamik and HS exam
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## LIST OF PUBLICATIONS

### *International*(SCI/ESCI/SCOPUS Indexed)

1. Suraj Roy, Apu Kumar Saha, Absalom E. Ezugwu and Sharmistha Bhattacharya Halder. "Multi-threshold segmentation of histopathological colorectal cancer images by an enhanced INFO algorithm". Journal of Big Data, (2026). <https://doi.org/10.1186/s40537-026-01495-5> (SCIE Q1, IF:10.8)
2. Arunava Bhattacharjee and Sharmistha Bhattacharya Halder. "Rough set inspired neutrosophic set: a new hybrid approach for uncertain information processing." (OPSEARCH), (2026): 1-26. <https://doi.org/10.1007/s12597-026-01182-2> (ESCI Q2, IF:1.7)
3. Suraj Roy, Sharmistha Bhattacharya Halder. "Intuitionistic Fuzzy Fractal Based Face Recognition in the SIFT Domain". *Natl. Acad. Sci. Lett.* (2026). <https://doi.org/10.1007/s40009-026-02198-4> (SCIE Q3, IF:1.1)
4. Suraj Roy, Sanjoy Chakraborty, Apu Kumar Saha, M. K. Sharma, Sharmistha Bhattacharya Halder and Debasish Bhowmik. "A Spiral and Enhanced Random Search Strategies Based Slime Mould Algorithm for Global Optimization and Interplanetary Spacecraft Trajectory Problem." *Communications in Nonlinear Science and Numerical Simulation*, 153, (2025): 109508. ISSN: 1007-5704. <https://doi.org/10.1016/j.cnsns.2025.109508> (SCI Q1, IF:3.8)
5. Srijita Barman Roy, Dipankar Deb, & Sharmistha Bhattacharya Halder. "A Fuzzy Oscillation Based Approach of Face Detection for Images with Some Concealed Features". *Pattern Recognit. Image Anal.* 35, 796–807 (2025). <https://doi.org/10.1134/S1054661825700592> (SCOPUS Q3, IF:0.4)

6. Sharmistha Bhattacharya Halder, Bibek Majumder. "Face Recognition Using Fuzzy Minimal Structure Oscillation in the Wavelet Domain". *Pattern Recognit. Image Anal.* 29, 174–180 (2019). <https://doi.org/10.1134/S1054661819010206> (SCOPUS Q3, IF:0.4)
7. Sharmistha Bhattacharya Halder, Srijita Barman Roy. "Application of IF set oscillation in the field of face recognition". *Pattern Recognit. Image Anal.* 27, 625–636 (2017). <https://doi.org/10.1134/S1054661817030270> (SCOPUS Q3, IF:0.4)
8. Sharmistha Bhattacharya Halder. (2016), Shouvik Bhattacharya "A method of generating A consistent fuzzy rule base with less number of rules using equivalence classes", *The Journal of Fuzzy Mathematics*, Los Angeles. Vol-24 issue-2. 499-506.
9. Sharmistha Bhattacharya Halder. (2016) "Clustering using similarity measure", *Annals of Fuzzy Mathematics and Informatics*. Vol-11 No 1, 97 -07.
10. Sharmistha Bhattacharya Halder and Piyali Debnath (2016) "A study on IF soft \* lower rough approximation and IF soft \* upper rough approximation", *Annals of Fuzzy Mathematics and Informatics*. Vol-11 No 3, 475-483.
11. Bhattacharya Halder, Sharmistha & Debnath, P. (2015). On IF Soft Oscillating Relation. *Journal of fuzzy mathematics*, 23(4), 757-766.
12. Bhattacharya, Sharmistha & Chanda, A. (2015). A Study on Intuitionistic Fuzzy Clustering. *Journal of fuzzy mathematics*, 23(3), 537-548.
13. Susmita Roy, & Sharmistha Bhattacharya Halder. (2014). "Application of Fuzzy-Rough Oscillation on the Field of Data Mining (Special Attention to the Crime Against Women at Tripura)". *Procedia Computer Science*, 45, 790-799. <https://doi.org/10.1016/j.procs.2015.03.155>
14. Susmita Roy, & Sharmistha Bhattacharya Halder. (2014). On fuzzy  $mX^*$  Oscillation and its application in image processing, *Annals of fuzzy Mathematics and Informatics*, Vol 7, No 2, 319-326
15. Bhattacharya Halder, Sharmistha & Tripathi, Jayanti. (2014). A Study on IF Regular Closed  $mX$  Set. *The Journal of Fuzzy Mathematics*, Los Angeles. 22. 939-949.
16. Bhattacharya Halder, Sharmistha & Tripathi, Jayanti. (2014). On IF weakly Generalized Minimal Closed Set. *The Journal of Fuzzy Mathematics*, Los Angeles. 22. 695-702.
17. Bhattacharya Halder, Sharmistha. (2014). A Study on Bayesian Decision Theoretic Rough Set. *International Journal of Rough Sets and Data Analysis*. 1. 1-14. 10.4018/ijrsda.2014010101.
18. Bhattacharya Halder, Sharmistha & Debnath, Kalyani. (2014). Attribute Reduction Using Bayesian Decision Theoretic Rough Set Models. *International Journal of Rough Sets and Data Analysis*. 1. 15-31. 10.4018/ijrsda.2014010102.
19. Bhattacharya Halder, Sharmistha & Debnath, Kalyani. (2014); A study on attribute reduction by bayesian decision theoretic rough set models; *Annals of fuzzy mathematics and informatics*; Vol 8, No 6, 913-920

20. Bhattacharya Halder, Sharmistha & Islam, Atikul. (2014) Text extraction from low contrast non uniform illuminated document images using mathematical morphology and fuzzy operator; Annals of fuzzy mathematics and informatics, vol 7, No 2, 495-515
21. Bhattacharya Halder, Sharmistha & Roy, Susmita. (2013). On IF-rough oscillatory region and it's application in decision making. Annals of Fuzzy Mathematics and Informatics. 5. 241-267
22. Bhattacharya Halder, Sharmistha & Islam, Atikul. (2013).; Contrast removal fuzzy operator in image processing; Annals of fuzzy Mathematics and Informatics, vol 6, No 2, 401-413
23. Bhattacharya Halder, Sharmistha & Islam, Atikul. (2013). Intuitionistic fuzzy mathematical morphological approach in image processing. The Journal of Fuzzy Mathematics. 21.
24. Bhattacharya Halder, Sharmistha & Tripathi, Jayanti. (2013). Some Properties of IF Semi  $m_X$  open Set. The Journal of Fuzzy Mathematics, Vol. 21, No.3 (2013). 21, No.3.
25. Bhattacharya Halder, Sharmistha. [On generalized regular closed sets](#) Int. Journal of Contemp. Math. Sciences, Vol. 6, 2011, no. 1-4, 145-152.
26. Bhattacharya Halder, Sharmistha. [On generalized minimal closed sets](#) Int. Journal of Contemp. Math. Sciences, Vol. 6, 2011, no. 1-4, 153-160.
27. Bhattacharya Halder, Sharmistha, Davvaz, Bijan, *Some More Results on IF Soft Rough Approximation Space, International Journal of Combinatorics*, 2011, 893061, 10 pages, 2011. <https://doi.org/10.1155/2011/893061>
28. Bhattacharya halder and Gour pal; Study on Pre  $m_X$  open set; Internatioanl mathematicakl Forum, Vol 6, 2011, no 45, 2231-2237
29. Bhattacharya Halder, Sharmistha. (2010). Some Results on IF Generalized Minimal Closed Set. International Journal of Mathematical Analysis. 4.no 32 1577-1589
30. Bhattacharya Halder, Sharmistha. (2010). A Study on Rare  $m_X$  Sets and Rarely  $m_X$  Continuous Functions. Hacettepe Journal of Mathematics and Statistics, 39(3), 295-303. <https://izlik.org/JA72XB97HD>
31. Bhattacharya Halder, Sharmistha. [Some results on IF generalized minimal closed set](#) Int. Journal of Math. Analysis, Vol. 4, 2010, no. 29-32, 1577-1589.
32. Bhattacharya, S. (2009). A study on category of  $m_X$  Induced Fuzzy minimal structure. *The journal of fuzzy mathematics*, 17(4), 979-984.
33. Bhattacharya Halder, Sharmistha.(2008). On fuzzy semi  $\delta$ -V continuity in fuzzy  $\delta$ -V topological space. Ukrainian Mathematical Journal. <https://doi.org/10.1007/S11253-008-0083-Y>
34. Bhattacharya Halder, Sharmistha.(2008).On fuzzy R-  $\Lambda$  and fuzzy R-V sets; Studii Si Cercetari Stiintifice, Seria Matematica, No 18 13-30

1. Sharmistha Bhattacharya Halder. (2026). A Strong Hybrid Equivalence Framework Based on Dominance Relations and Sensitivity Distance. INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS – IJCRT. Vol. 14 (issue 2), a631-a635
2. Sharmistha Bhattacharya Halder. (2026)Unveiling Data Structures with DRSA: Bridging Gaps in Decision Making ;TIJER , 12, 296-306
3. Arunava Bhattacharjee, Sharmistha Bhattacharya Halder, Md. Azad Hussain. (2026). An Enhanced Reduct Method using Rough Set Theory for Attribute Reduction. Volume 12 Issue 6, ISSN: 2349-6002. doi.org/10.64643/IJIRTV12I6-187433-459
4. Sharmistha Bhattacharya Halder, "From Rough Information Base to Dominance-Oriented Decision Models: A Theoretical and Applied Study", IJRAR - International Journal of Research and Analytical Reviews (IJRAR), E-ISSN 2348-1269, P- ISSN 2349-5138, Volume.12, Issue 4, Page No pp.112-122, November 2025, Available at : <http://www.ijrar.org/IJRAR25D1912.pdf> \_
5. Bhattacharjee, Arunava & Bhattacharya Halder, Sharmistha & Sarkar, Tandra. (2025). Rough Set Theory: Past, Present, and Future - A Comprehensive Review. Journal of Emerging Technologies and Innovative Research. 12. 10.56975/jetir.v12i10.570603.
6. Bhattacharya Halder S and andShantanu(2025), A study on a new approach to decision analysis using dominance rough set approach, International Journal of Research and Analytical Reviews (IJRAR) , 12, 797-808
7. Sharmistha Bhattacharya Halder. (2023). On Minimal  $\Lambda$  dense set. Turkish Journal of computer and Mathematic s education. 1309- 4653
8. Utpal Pal, Sharmistha Bhattacharya (Halder). (2018). IMPACT OF BAYESIAN DECISION THEORETIC ROUGH SET-BASED ATTRIBUTE REDUCTION ON CART. JETIR. Vol 5, issue 7, 336- 342
9. Sumanta Saha, Bhattacharya Halder, Sharmistha. (2017). Application of Fuzzy m \* x Oscillation in the Field of face recognition using Rough Set. IOSR Journal of Computer Engineering. Vol 19, Issue 4, Jul – Aug 2017, 07- 13. <https://doi.org/10.9790/0661-1904030713>
10. Saha, Sumanta & Bhattacharya Halder, Sharmistha. (2017). A SURVEY: PRINCIPAL COMPONENT ANALYSIS (PCA). IJARSE. Vol 6, Issue 6, 312- 320.
11. Saha, Sumanta & Bhattacharya Halder, Sharmistha. (2017). A new algorithm for removal of high density salt and pepper noise in MR Images; IJARSE, Vol 6,No 6, 344-359
12. Bhattacharya Halder, Sharmistha &Pal, G. (2016). A STUDY ON PRE-mX CONTINUOUS FUNCTION. Journal of New Theory, 12, 8-22. <https://izlik.org/JA43PX65HY>
13. Bhattacharya Halder, Sharmistha and Debnath Piyali; on Interval valued IF Soft Rough Approximationa space and its properties; Bulletin Kerala Mathematics Society, Vol 12 Dec 2015 No 2, 145-160
14. Bhattacharya Halder Sharmistha and Das Purnendyetal(2016) ; Color coding/decoding method based on newly constructed fuzzy transforms, Engineering and International Research journal,

15. Bhattacharya Halder Sharmistha and Das Purnendyetal(2016) ;Approximating Solution of ordinary differential using shepard kernel based fuzzy transform, Engineering and International Research journal, Vol 5 , 54-
16. Bhattacharya Halder, Sharmistha & Roy, Susmita. (2014). On fuzzy  $mX^*$ -oscillation and it's application in image processing. Annals of Fuzzy Mathematics and Informatics. 7. 319-326.
17. Bhattacharya Halder, Sharmistha & Pal, G. (2014). Upper and Lower Rarely  $mX$ - $mY$  Continuous Multifunction. Journal of New Results in Science, 3(5), 48-56.  
<https://izlik.org/JA64KW96GM>
18. Bhattacharya Halder, Sharmistha & Das, P. (2014). A METHOD FOR APPROXIMATING SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS BY USING FUZZY TRANSFORMS. *Journal of Nonlinear Analysis and Optimization: Theory & Applications (JNAO)*, 5(1), 81–87. retrieved from <https://pho3.tci-thaijo.org/index.php/jnao/article/view/2736>
19. Bhattacharya Halder, Sharmistha & Roy, S. (2013). Application of fuzzy rough oscillatory region on data collected for HIV/AIDS. *Bulletin of Kerala Mathematical Society*, (1), 19–26.
20. Bhattacharya Halder, Sharmistha. And Gour pal(2012); Upper and lower rarely pre  $mX$ - $mY$ continuous multifunction; J,Tri.Math,Soc; vol 14, 69-73
21. Bhattacharya, Shouvik & Bhattacharya Halder, Sharmistha. “Control of Traffic using Fuzzy traffic Light Controller”, Journal of the Tripura Math. Soc., Spl. Vol. 13(2011), pp 71-80.
22. Bhattacharya Halder, Sharmistha. (2013). A study on fuzzy  $\Delta$  set and fuzzy  $\nabla$  set. Bulletin Kerala Math society 10 No 2, 227- 233.
23. Bhattacharya Halder, Sharmistha & Pal, Gour. (2013). Pre  $mX$  Generalized Closed Set and its Application. Journal of New Results in Science, 2(3), 38-48. <https://izlik.org/JA95RE88UB>
24. Bhattacharya Halder, Sharmistha. And Gour Pal (2012); Some properties of pre\*  $mX$  continuous function : bulletin kerala mathematics association, Vol 9, No 1, 129-139
25. Bhattacharya Halder, Sharmistha. (2012)and Md Atikul Islam. Effects of basic fuzzy operation on fuzzy images in image processing, Bulletin kerala math association v-9, no2, 303 - 313
26. Bhattacharya Halder, Sharmistha & Bhattacharya, Shouvik. “A method of reducing the number of rules in a fuzzy rule base, particularly with three input parameters”, Bulletin of the Kerala Mathematical Association, Vol. 9, No. 2 (Dec. 2012), pp 313-319
27. Bhattacharya, S. (2012). Study on Bi-Polar Fuzzy-Rough Control Theory. International Mathematical forum, Bulgaria. Vol7, No 41, 2019- 2025
28. Sharmistha Bhattacharya Halder, Some results on if generalized minimal  $\wedge$  set, J. Math. Comput. Sci., 2 (2012), 1425-1435
29. Bhattacharya Halder, Sharmistha & Tripathi, Jayanti. (2011). Study of properties of various



combined operator of closure and  $m_X$  - interior in Intuitionistic Fuzzy Topological Spaces. Bulletin of Kerala Mathematical Association, Vol 8, No.1.

30. Bhattacharya Halder, Sharmistha. And Roy Susmita(2011) ; On Rough Minimal structure(RmX-structure); J Tri Math Soc; (special volume); 107-113
31. Bhattacharya Halder, Sharmistha. And Pal Gour(2011) ;Some properties of  $pre^* m_X$  open set; J Tri Math Soc; (special volume); 101-106
32. Bhattacharya Halder, Sharmistha. And Md Atikul Islam(2011) ; A special relation in fuzzy image processing; J Tri Math Soc; (special volume); 81-100
33. Bhattacharya Halder, Sharmistha. And Bhattacharya Shouvik(2011) ; Control of Traffic using fuzzy traffic light controller; J Tri Math Soc; (special volume); 71-80
34. Bhattacharya Halder, Sharmistha. (2010). Study on various fundamental operators in a topological space. *Antarctica Journal of Mathematics*, 7(1), 103–110.
35. Bhattacharya Halder, Sharmistha. (2009). On Intuitionistic fuzzy generalized  $m_X$  closed set. J. Tri Math Society 11, 49 - 54.
36. Bhattacharya Halder, Sharmistha. (2008). On intuitionistic fuzzy oscillatory region. *International Journal of Fuzzy Systems and Rough Systems*, 1(1), 15–19.
37. Bhattacharya Halder, Sharmistha. (2008). On fuzzy  $\delta$  generalized closed sets, South East Asian Journal of Mathematics and Mathematical Sciences. Vol. 7, No. 1, pages 5-17
38. Bhattacharya Halder, Sharmistha. (2008). On fuzzy  $\delta$ - $\Lambda$  and fuzzy  $\delta$ -V generalized sets. Acta Ciencia Indica. Mathematics. 1649
39. Bhattacharya Halder, Sharmistha. And Susmita Roy (2008) ; basic Probability assignments in HIV Aids; Acta Ciencia Indica vol XXXIV No 2 717-722
40. Bhattacharya Halder S, and chandaSukanta(2008); Some properties of  $m_X$ -  $\Lambda$ (Resp  $m_X$ -V) sets and its applications; Acta Ciencia Indica , Vol XXXIV, M No 2, 513-523
41. Mukherjee, A. & Halder, S(2007); Some stronger forms of contra fuzzy I(do,o)mapping; J Tri Math, Soc, Vol 9, 29-44
42. Bhattacharya Halder, Sharmistha. (2007). On fuzzy strongly  $\delta$ - $\Lambda$  and fuzzy strongly  $\delta$ -V generalized set. Acta Ciencia Indica. Mathematics. 33.
43. Mukherjee, A. & Halder, S(2007); On fuzzy  $\delta$ -n topological space and its application; J Tri math Soc; Vol 9; 5-20
44. Mukherjee, A. & Halder, S.(2006); Study of operators generated by fuzzy  $\delta$ - $\Lambda$  sets and fuzzy  $\delta$ -V sets; Acta Ciencia Indica, Vol XXXII, No 1, 279-282
45. Mukherjee, A. & Halder, S. (2005); Some properties of fuzzy  $\delta^*$  connectedness; J Tri Math Soc,

46. Mukherjee, A. & Halder, S. (2006); On fuzzy supra semi  $\delta$ -V continuity in fuzzy supra semi  $\delta$ -V topological space; Acta Ciencia Indica, Vol XXXII, No 4, 1369-1376
47. Mukherjee, A. & Halder, S. (2004); Some properties of fuzzy  $\delta$ - $\Lambda$  sets and fuzzy  $\delta$ -V sets; J Tri Math Soc, 6, 23-34
48. Mukherjee, A. & Halder, S. (2004); On fuzzy semi  $\delta$ - $\Lambda$  sets and fuzzy semi  $\delta$ -V sets; J Tri Math Soc, 6, 81-88

### ***International-Conference Proceedings & Book Chapters***(Scopus Indexed)

1. Sarkar, T., Halder, S.B. (2023). A Study on Interval-Valued Intuitionistic Fuzzy Oscillatory Region. In: Buyya, R., Misra, S., Leung, YW., Mondal, A. (eds) Proceedings of International Conference on Advanced Communications and Machine Intelligence. MICA 2022. Studies in Autonomic, Data-driven and Industrial Computing. Springer, Singapore. [https://doi.org/10.1007/978-981-99-2768-5\\_1](https://doi.org/10.1007/978-981-99-2768-5_1)
2. Majumder, B., Bhattacharya, S. (2023). In Plane and Out Of Plane Rotation Face Detection Model. In: Pati, B., Panigrahi, C.R., Mohapatra, P., Li, KC. (eds) Proceedings of the 6th International Conference on Advance Computing and Intelligent Engineering. Lecture Notes in Networks and Systems, vol 428. Springer, Singapore. [https://doi.org/10.1007/978-981-19-2225-1\\_41](https://doi.org/10.1007/978-981-19-2225-1_41)
3. Majumder, B., Bhattacharya (Halder), S. (2020). Face Recognition Based on Human Sketches Using Fuzzy Minimal Structure Oscillation in the SIFT Domain. In: Bhattacharjee, A., Borgohain, S., Soni, B., Verma, G., Gao, XZ. (eds) Machine Learning, Image Processing, Network Security and Data Sciences. MIND 2020. Communications in Computer and Information Science, vol 1241. Springer, Singapore. [https://doi.org/10.1007/978-981-15-6318-8\\_27](https://doi.org/10.1007/978-981-15-6318-8_27)
4. Pal, U., (Halder), S.B. (2019). An Application of Maximum Probabilistic-Based Rough Set on ID3. In: Satapathy, S., Joshi, A. (eds) Information and Communication Technology for Intelligent Systems. Smart Innovation, Systems and Technologies, vol 106. Springer, Singapore. [https://doi.org/10.1007/978-981-13-1742-2\\_52](https://doi.org/10.1007/978-981-13-1742-2_52)
5. Bhattacharya (Halder), S., Roy, S.B. (2018). A Framework for Face Recognition Based on Fuzzy Minimal Structure Oscillation and Independent Component Analysis. In: Bhattacharyya, S., Sen, S., Dutta, M., Biswas, P., Chattopadhyay, H. (eds) Industry Interactive Innovations in Science, Engineering and Technology. Lecture Notes in Networks and Systems, vol 11. Springer, Singapore. [https://doi.org/10.1007/978-981-10-3953-9\\_20](https://doi.org/10.1007/978-981-10-3953-9_20)
6. Pal, U., Bhattacharya (Halder), S., Debnath, K. (2017). A Study on CART Based on Maximum Probabilistic-Based Rough Set. In: Ghosh, A., Pal, R., Prasath, R. (eds) Mining Intelligence and Knowledge Exploration. MIKE 2017. Lecture Notes in Computer Science(), vol 10682. Springer, Cham. [https://doi.org/10.1007/978-3-319-71928-3\\_39](https://doi.org/10.1007/978-3-319-71928-3_39)



7. Pal, U., Bhattacharya (Halder), S., Debnath, K. (2017). R Implementation of Bayesian Decision Theoretic Rough set Model for Attribute Reduction; Industry Interactive Innovations in Science, Engineering and Technology, Part of the book series: [Lecture Notes in Networks and Systems](#) ((LNNS,volume 11).
8. Halder Bhattacharya, S. B. Roy and S. Saha, "Application of Fuzzy Oscillation in the field of Face recognition," *2015 International Symposium on Advanced Computing and Communication (ISACC)*, Silchar, India, 2015, pp. 192-197, doi: 10.1109/ISACC.2015.7377341
9. Bhattacharya Halder S and Das Purnendu; A study on the monotonicity of the Bipolar Fuzzy Transform; International research journal, Vol 1, No 2, 618-627
10. Bhattacharya halder S and Md Atikul Islam; (2015); A new fuzzy operator in enhancing images; Rough sets, fuzzy sets and soft computing ,81-86
11. Halder, S.B. & Tripathi, Jayanti. (2009). Intuitionistic Fuzzy Regular closed mx set. Proceedings of International conference on Rough Sets Fuzzy Sets and soft computing. 297-306.
12. Halder, S.B. & Roy Sushmita. (2009). Some more results on fuzzy rough oscillatory region and its application in decision making. Proceedings of International conference on Rough Sets Fuzzy Sets and soft computing. 206-216.
13. Halder, S.B. & Roy Sushmita. (2008). Some properties of fuzzy rough oscillatory region and its application in data mining. Proceedings Nat sem on rec dev in math & its aplications; 10-18.
14. Mukherjee A and Halder, S.B(2007); Some more results on oscillatory region of a fuzzy set; International conference on Modeling and simulation, CIT, Coimbatore, 27-29 August, 665-670
15. Mukherjee A and Halder, S.B(2007); On Fuzzy  $\delta$  separation axiom; Mathematics and applications Recent Trends (MART) 32-36
16. Mukherjee A and Halder, S.B(2006); Boolean algebra formed by the set of fuzzy operators topology; Proc nat Sem on fuzzy math & its appl, Nov 25-26, 123-130
17. Mukherjee, A. & Halder, S.,  $\delta$ -Induced Fuzzy Topological Spaces, Proc. Nat. Sem. on Recent Trends in Maths. & Its Appl., April 28-29, 2003, pp. 177-182, 2003.
18. Halder Sharmistha;(2005). Cosmology an inseparable part of vedanta;Proceedings of the seminar cum workshop on vedic mathematics, April 2005, 22- 23

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## BOOKS

1. Rough Sets, Fuzzy Sets and Soft Computing, Narosa Publication, New Delhi, ISBN: 978-81-8487-403-7
2. Fuzzy set and fuzzy Topology, Narosa publication, New Delhi, ISBN: 978-81-8487-372-6
3. Crime against women in North East India, Lambert Academy publisher, Germany, 2011

4. A study on generalized regular open sets, Lambert Academy publisher, Germany, 2011, ISBN: 978-3-8465-9075-1
  5. Delta Induced fuzzy topology generated by delta open set, Lambert Academy publisher, Germany, 2010, ISBN: 978-3-8433-5213-0
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## **RESEARCH PROJECTS**

1. Title: Study on intuitionistic fuzzy soft set relation intuitionistic fuzzy rough set and their application in various real life problems, UGC, Grant Amount: ₹ 8,27,800/-, Completed (Feb 2013)
  2. Title: On generalized regular open sets and its applications, UGC, Grant Amount: ₹ 70,000/-, Completed (2009-2011)
  3. Title: Generalized  $\delta$  open set and its application, UGC, Grant Amount: ₹ 60,000/-, Completed (2006-2008)
  4. Title: Short-term Minor Research on Practices and Challenges in Women's Health and Hygiene: A Study of Tribal Communities in ADC Villages of Tripura, UGC (Womens Study Centre), 1 lakh approx., 2025-2026, Completed
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## **RESEARCH SUPERVISIONS**

1. Susmita Roy, Title: "On fuzzy rough oscillatory region and its applications on data mining", Awarded in 2012.
2. Jayanti Tripathy, Title: "On some generalized concepts of IF mX structure and their applications", Awarded in 2014.
3. Md Atikul Islam, Title: "Study on some new fuzzy relations and its applications in the field of fuzzy image processing", Awarded in 2015.
4. Shouvik Bhattacharya, Title: "Fuzzy rough queuing control and their applications in traffic control", Awarded in 2015.
5. Purnendu Das, Title: "Some properties of newly constructed fuzzy transforms and its applications in numerical analysis", Awarded in 2016.
6. Kalyani Debnath, Title: "On Bayesian decision theoretic rough set model and its application", Awarded in 2017.
7. Piyali Debnath, Title: "IF soft rough oscillatory region and its application", Awarded in 2017.

8. Gour pal, Title: “A study on generalized pre mX open set on topology generated by mX structure”, Registered and left.
9. Amarjit Chanda, Title: “A study on some new methods of clustering and applications”, Awarded in 2020.
10. Utpal Pal, Title: “A study on Bayesian decision theoretic rough set using R Package”, Awarded in 2020.
11. Sumanta Saha, Title: “A study on hybridized ICA PCA Rough set model and its application in the field of image processing”, Awarded in 2020.
12. Srijita Barman Roy, Title: “A study on image processing techniques using various generalized forms of ICA and PCA”, Awarded in 2020.
13. Bibek Majumder, Title: “A Study on Face Recognition Using Various Scale, Rotation and Shift Invariant Transformations”, Awarded in 2021.
14. Tandra Sarkar, Title: “A study on Intuitionistic fuzzy set based hybrid approach on image processing”, Awarded in 2025.
15. Suraj Roy, Title: “A Study on the Applications of Optimization Algorithms in Image Processing Problems”, Registered.
16. Shantanu Das, Title: “A Study OnA New Approach To Decision Analysis Using Dominance Rough Set Approach.”, Registered.
17. Arunabha Bhattacharya, Title: “AMOAR: An Adaptive Multi-Objective Algorithm for Attribute Reduction in Rough Sets & Data Mining”, Registered.

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## **PhD Thesis Evaluation and Chaired Oral Defences of Various University**

1. Assam University
2. Central Institute of Technology, Kokrajhar
3. APJ Abdul kalam Technological University, Thiruvananthapuram
4. LN Mithila University, Darbhanga
5. Bharatidasan University, Tiruchirapalli
6. Annamalai University, Tamilnadu
7. ManonmaniamSundaranar University, Tirunelveli
8. APC Mahalaxmi College for women, Tamilnadu
9. Vidyasagar University, Westbengal
10. Holycross college, Tiruchirapalli
11. University of Kalyani

etc. and many more

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### Local Newspaper/Books

1. DainikSambadpatrika, 1<sup>st</sup> May 2026; May Diwaseramalinahwan(Bengali)
  2. DainikSambadpatrika; 3<sup>rd</sup> April 2025; Shishurupojogishikhsaradhikar(Bengali)
  3. Syandan Patrika; 13<sup>th</sup> April 2018; Boimela: Ramdhanu Ghana Swapnersheshe(Bengali)
  4. Hridyaye Najrul (Kaji Najrul Islam Academy and Research Centre), Naribadi Tatter aloke Najrul Islam ektibahumatrikdikkha(Bengali): (2026), 106-116
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### SEMINAR/ CONFERENCE/ TRAINING PROGRAMME ORGANIZED

1. 21–25 July 2025 One Week Lecture Series on Vikshit Bharat and the Social Inclusion of Women
2. 26 August 2025 Extempore Essay Writing Competition to commemorate the Women Freedom Fighters of the Country
3. 10 September 2025 Awareness Programme on Suicide Prevention
4. 28 November 2025 One Day Lecture Series on Women, Violence and Resistance
5. 28–29 January 2026 Two-Day Gender Sensitisation Workshop
6. 11 February 2026 Capacity Building Workshop on GST Reforms and its Impact on Consumption Pattern of the Middle and Neo-Middle Classes with a Gender Perspective
7. 12 February 2026 National Seminar on Reimagining Development: Gender, Power and Sustainability
8. 11–20 March 2026 10-Day Skill Development Training Programme on Candle Making for Women
9. 18 March 2026 Bone Health Check-up Programme for Women Sweeping and Security Staff
10. 2025-2026 Short-term Minor Research on Practices and Challenges in Women's Health and Hygiene: A Study of Tribal Communities in ADC Villages of Tripura
11. 9th August 2024 Essay Writing Competition on „Contribution of Women in India's Freedom Movement“
12. 12th August 2024 Quiz Competition on Freedom Movement of India, Women Achievers and General Knowledge
13. 30th August 2024 Silent March against RG Kar Incidence
14. 19th September 2024 One Day EDP Awareness Programme for Women

15. 25th November 2024 One day Lecture Series on International Day for the Elimination of Violence against Women
16. 8th December 2024 Sit and Draw Competition on „Stand Up, Speak Out for Gender Equality“
17. 24th January 2025 One Day Free Eye Check-up Camp
18. 11th February 2025 One Day lecture Series on International Day of Women and Girls in Science
19. 13th February 2025, Celebration of National Women's Day
20. 24th February 2025 One Day Seminar on Gender Mainstreaming on Economic Development
21. 3-5 march 2025 3 - Day Skill Development Training Programme for Tribal Women
22. 6-8 march 2025 3-Day Training and Skill Development Programme for Non- Tribal Rural Women from
23. 7th March 2025 Health and Awareness Camp for Marginalised Women Workers
24. 11th March 2025 Documentary Film Screening and Interactive Session on Trafficking
25. 12th March 2025 Health Camp for Rural Women
26. 19th March 2025 One-Day Workshop on Prevention, Prohibition, and Redressal of Sexual Harassment of Women at Workplace
27. 2023-2024 Prepared Gender Audit Report of Tripura University
28. International e conference on Rough sets - Generalization and Applications; Nov 11-13, 2021, organizing secretary.
29. ISI-TU Winter School on Pattern Recognition and Image Processing, March 25-29, 2014 Department of Mathematics, Tripura University.
30. 10<sup>th</sup> September 2011, National Seminar on mathematical Analysis and its Applications, Tripura University, Acted as an organizing secretary
31. Nov 11-12, 2011, National Seminar on Rough set, fuzzy set and soft computing; acted as a organizing secretary

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### INVITED TALK AT VARIOUS SEMINAR/ CONFERENCE/ TRAINING PROGRAMME

1. National Seminar On “From Disparity To Parity: Gender Equality For Inclusive Development”, 20th And 21st February 2026, Dept of Economics And Political Science, Mbb College; Guest Of Honour.
2. National Conference on Feminism and Research methodology, MBB College, Panel Discussion Invited Speaker, 2026

3. SHORT TERM COURSE ON FEMINIST RESEARCH METHODOLOGY, 27-31 oct 2025, Mizoram University, Resource Person in FDP
4. International conference on Advance in Contemporary Mathematics, Womens college, 19-21 March 2026, Invited talk
5. Workshop on feminism and research methodology, 27-31 oct 2025, Mizoram University
6. Pi day, Womens College, Delivered Invited Talk, 2025
7. Vedic Cosmology, ICFAI University, Delivered Invited Talk
8. Vedic cosmology, National Conference on Ancient Maths, 8-9 Feb, 2024 Tripura Mathematical Society, Agartala, Delivered Invited Talk
9. Invited to be the Guest Speaker in the Indian Knowledge System (IKS) talk organized by the Department of Mathematics, The ICFAI University, Tripura. 28<sup>th</sup> October 2024
10. International Conference on Role of mathematics for the Development of Science and Society; Chaired a session, 21-22 Dec 2023, Tripura University
11. International Conference on fuzzy sets and fuzzy logic generalizations and applications, 6<sup>th</sup> and 7<sup>th</sup> September 2022, FRSA, Tripura
12. 5<sup>th</sup> International Conference on Soft Computing and its Engineering Applications (icSoftComp2023) December 07-09, 2023. Smt. Chandaben Mohanbhai Patel Institute of Computer Applications, Charotar University of Science and Technology (CHARUSAT), Changa, India
13. International Conference on fuzzy sets and fuzzy logic generalizations and applications, 6<sup>th</sup> and 7<sup>th</sup> September 2022, FRSA, Tripura, Delivered Invited Talk
14. National seminar on Mathematics and its applications on Real world problems, MBB University, Dec 22, 2021, **CHIEF GUEST**
15. Refresher Course in Mathematics organized by University of North Bengal, acted as one of the adjudicator in the seminar presentation session , dated 08<sup>th</sup> January 2021 to 21<sup>st</sup> January 2021
16. National Conference on Vedic Mathematics including Ancient Indian Mathematics, Dec 28-29 2019, Delivered invited talk
17. State level Science, Mathematics and Environment Exhibition: Delivered invited talk dated December 2019
18. International Conference on Recent Advances in Mathematics and its Applications (ICRAMA 2019), Tripura university, delivered invited talk
19. National seminar on the status of Tribal education in degree and above degree level- problems and solutions” organized by Womens Polytechnique, 9<sup>th</sup> December 2019; Delivered invited talk



20. A popular talk on Mathematics, Organized by Science Forum Womens college on 24<sup>th</sup> November 2015, Delivered invited talk
  21. 30<sup>th</sup> Dec 2006; 72<sup>nd</sup> Annual Conference of The Indian Mathematical Society, presented paper in Jawalpur
  22. National Seminar on Rough Sets, Fuzzy sets and their Applications; dated April 2010; Presented paper
  23. International conference on modelling and simulation, Coimbatore, 27-29<sup>th</sup> August 2007, Presented paper
  24. International conference on Fuzzy mathematics and its applications, 27<sup>th</sup> -29<sup>th</sup> January 2007, Ahmednagar, presented paper
  25. Capacity building of women managers in Higher Education Sensitivity/ Awareness/ Motivation workshop; participated, 2007
  26. Orientation Programme, Burdwan University, 2007
  27. International Conference, Organized by BUET, Dhaka Bangladesh, Presented paper, December 2009
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### **Administrative Responsibilities**

1. First and starting Hostel Superintendent of Women's Hostel, Tripura University, Tripura (2007-2010)
2. IGNOU Coordinator, Tripura University Centre (2010)
3. Head, Dept of Mathematics for various terms
4. Director, Women's Studies Centre, Tripura University (2024 till date)
5. Member of College Development Council, Tripura University, Tripura 2026
6. Member of Convocation committee, 2026
7. BPGS member, Dept of Mathematics, Assam (2019-2021)
8. BPGS Member, MBB University, Tripura (2024 till date)
9. External Member of PhD Research committee, MBB University (2020-2023)
10. Vice President of Tripura Mathematical Society (2020-2022)
11. Editor of Bulletin, Tripura Mathematical Society (before 2020)
12. Nominated as a subject expert in the expert committee for CAS promotion of various Faculty of College. (2024 till date)
13. Served as an expert member in interview board, MBB University
14. Regional Coordinator, RMO, INMO, Tripura Region (2020 till date)

15. General Secretary of FRSA, Tripura (2022-2024)
16. Member of Academic Purchase Committee, Tripura University, 2016
17. Asst Coordinator of IMD, Tripura University, 2014
18. Nomination for Data Auditor, TIT, Tripura, 2014
19. BUGS member, Assam University, 2012
20. Member of the committee for prevention of sexual harrassment, IGNOU, 2012
21. Advisory committee member of Campus Renewale Energy Park, Tripura University dated 2008
22. Member of inspection team of Sonamura college, 2008
23. Member of Anti ragging committee, 2007

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### **Reviewer**

Different reputed SCOPUS indexed journals

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### **Collaboration**

1. Prof Apu Kumar Saha, NIT Agartala.
2. Prof Bijan Dawaz; Yazd, Iran.

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### **Member of Various other Academic Bodies**

1. Tripura Mathematical Society
  2. IEEE
  3. FRSA
  4. Gnan Bichitra, Tripura
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