Laxminarayan Sahoo
Associate Professor
Department of Computer and Information Science
Raiganj University, Raiganj 733134, West Bengal, India
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Academic Qualifications:

- **M.Sc., PhD, NET (CSIR), GATE (IISc. Bangalore)**
  - **GATE Rank:** AIR-41
  - **PhD Thesis Title:** Studies on Reliability Optimization Problems by Genetic Algorithm
  - **PhD Supervisors:**
    - Prof. A. K. Bhunia, Department of Mathematics, The University of Burdwan, WB.
    - Late Prof. Dilip Roy, Centre for Management Studies, The University of Burdwan, WB.
  - **Fellowship:** MHRD Fellowship, Department of Computer Science and Engineering, IIT ISM Dhanbad, India (M. Tech Program)

Awards and Recognition:

- Recipient of the Prof. M. N. Gopalan Award for Best Ph.D. Thesis in Operations Research (2012)

Specialization:

- Advanced Optimization and Operations Research

Research Interests:

- Reliability Optimization
- Evolutionary Computations
- Interval Mathematics and Optimizations
- Fuzzy Decision Making & Multi-Criteria Decision Making under Uncertain Environment
- Operations Research
- Game Theory
- Inventory Control
- Search Engine Optimization
- Graph Theory
- Artificial Neural Networks and Machine Learning
- Data Analytics
- Wireless Sensor Networks
- Distributed Network Systems

Research Project:

- Completed: 1
- **Sponsored by:** University Grants Commission (UGC), Government of India

PhD Guidance:

1. **Avishek Banerjee**
   - **Title of Thesis:** Studies of some evolutionary algorithms and applications in reliability optimization

    - **Institution:** Jadavpur University, Department of Information Technology
    - **Degree:** PhD in Engineering
    - **Status:** Completed (2019)
2. **Subhradeep Maitra**
    - **Title of Thesis:** Studies on some search engine optimization techniques and its applications during Covid-19 Pandemic
    - **Institution:** Raiganj University, Department of Computer and Information Science
    - **Degree:** PhD in Science
    - **Status:** Completed (2023)
3. **Supriyan Sen**
    - **Title of Thesis:** Modeling and optimization of some network design problems under uncertainty
    - **Institution:** Raiganj University, Department of Computer and Information Science
    - **Degree:** PhD in Science
    - **Status:** Completed (2024)
4. **Rakhi Das**
    - **Title of Thesis:** A study on optimal path selection of some special graphs
    - **Institution:** Raiganj University, Department of Computer and Information Science
    - **Degree:** PhD in Science
    - **Status:** Completed (2024)
5. **Sanchita Guchhait**
    - **Title of Thesis:** A study on homophily detection in social networks using dynamic centrality
    - **Institution:** Raiganj University, Department of Computer and Information Science
    - **Degree:** PhD in Science
    - **Status:** Pursuing

Reviewing of Research Papers:

- Extensively reviewed research papers for several reputed journals, including:
    - Computers & Industrial Engineering (Elsevier Science)
    - Applied Mathematics and Computation (Elsevier Science)
    - International Journal of System Assurance Engineering & Management (Springer)
    - Neural Computing & Applications (Springer)
    - IIE Transactions (Taylor and Francis)
    - IJLSM (Inderscience)
    - IJOR (Inderscience)
    - IJMOR (Inderscience)
    - Scientia Iranica
    - AIMS Mathematics
    - MDPI
    - Mathematical Problems in Engineering (Hindawi)

Editorial Board Membership:

- **Academic Editor:** Mathematical Problems in Engineering, Hindawi
- **Associate Editor:** Journal of Graphic Era University (JGEU), River Publishers

Fellow Membership:

- Fellow Member, ISROSET (ISROSET-FM-1159)

Publications:

List of Journals:

77. Sahoo, L., & Guchhait, S. (2024). Exploring homophily in research collaboration: A dynamic centrality analysis approach. Journal of Graphic Era University, 12(2), 243–262. https://doi.org/10.13052/jgeu0975-1416.1224

76. Sahoo, L., & Das, R. (2024). Shortest path of a random graph and its application. Journal of Graphic Era University, 12(1), 53–76. https://doi.org/10.13052/jgeu0975-1416.1214

75. Sen, S., Sahoo, L., & Ghosh, S. L. (2024). Lifetime extension of wireless sensor networks by perceptive selection of cluster head using K-means and Einstein weighted averaging aggregation operator under uncertainty. Journal of Industrial Intelligence, 2(1), 54–62. https://doi.org/10.56578/jii020105

74. Sahoo, L., Guchhait, S., Allahviranloo, T., Kumar, J. R. R., Tarambale, M. R., & Catak, M. (2024). Conflict distance-based variable precision Pythagorean fuzzy rough set in Pythagorean fuzzy decision systems with applications in decision making. Journal of Mathematics and Computer Science-JMCS.

73. Sahoo, L., Sen, S., Tiwary, K. S., Moslem, S., & Senapati, T. (2024). Improvement of wireless sensor network lifetime via intelligent clustering under uncertainty. IEEE Access.

72. Sen, S., Sahoo, L., Tiwary, K., & Senapati, T. (2023). Entropy weighted TOPSIS based cluster head selection in wireless sensor networks under uncertainty. Telecom, 4(4), 678–692. https://doi.org/10.3390/telecom4040030

71. Sahoo, L., Das, R., & Samanta, S. (2023). Bi-weighted graph-based optimal path selection for a network. International Journal of Scientific Research in Mathematical and Statistical Sciences, 10(4), 1–8.

70. Sen, S., Sahoo, L., Tiwary, K., Simic, V., & Senapati, T. (2023). Wireless sensor network lifetime extension via K-medoids and MCDM techniques in uncertain environment. Applied Sciences, 13(5), 3196. https://doi.org/10.3390/app13053196

69. Chakraborty, J., Mukherjee, S., & Sahoo, L. (2023). Intuitionistic fuzzy multi-index multi-criteria decision-making for smart phone selection using similarity measures in a fuzzy environment. Journal of Industrial Intelligence, 1(1), 1–7. https://doi.org/10.56578/jii010101

68. Maitra, S., Sahoo, L., Sen, S., & Tiwary, K. (2023). Comparison of websites employing search engine optimization and live data. Journal of Computer Science Research, 5(2), 16–27.

67. Das, P., Nath, I., Banerjee, A., & Sahoo, L. (2022). Co-bot: An intelligent technique for designing a chatbot for initial covid-19 test. Journal of Computer Science Research, 4(4), 26-35..

66. Das, R., Sahoo, L., Samanta, S., Simic, V., & Senapati, T. (2022). Identifying the shortest path of a semidirected graph and its application. Mathematics, 10(24), 4807.

65. Sahoo, L., Bhunia, A. K., Pal, P., & Bala, S. (2023). Tournament constriction coefficient based particle swarm optimization (TPSO-Co) for engineering design optimization problems. International Journal of System Assurance Engineering and Management, 14, 87–98. https://doi.org/10.1007/s13198-022-01824-w

64. Sahoo, L. (2023). Transportation problem in Fermatean fuzzy environment. RAIRO - Operations Research, 57, 145–156. https://doi.org/10.1051/ro/2022210

63. Maitra, S., Sahoo, L., & Tiwary, K. S. (2022). Study, analysis, and comparison between Amazon A10 and A11 search algorithm. Journal of Computer Science Research, 4(4), 1–6.

62. Maitra, S., Sahoo, L., & Tiwary, K. S. (2022). Methods and strategies for search engine optimization. COJ Robotics & Artificial Intelligence, 2(2), 1–7.

61. Sahoo, L., Sen, S., Tiwary, K. S., Samanta, S., & Senapati, T. (2022). Optimization of data distributed network system under uncertainty. Discrete Dynamics in Nature and Society, 2022, 1–12. https://doi.org/10.1155/2022/8763435

60. Sahoo, L., Sen, S., Tiwary, K. S., Samanta, S., & Senapati, T. (2022). Modified Floyd-Warshall's algorithm for maximum connectivity in wireless sensor networks under uncertainty. Discrete Dynamics in Nature and Society, 2022, 1–11. https://doi.org/10.1155/2022/9463821

59. Banerjee, A., Garg, D., Das, V., Sahoo, L., Nath, I., Varadarajan, V., & Kotecha, K. (2022). Design of energy efficient WSN using a Nobel SMOWA algorithm. Computers, Materials & Continua, 72(2), 3585–3600.

58. Sahoo, L., Bhunia, A. K., & Mahato, S. (2022). Optimization of system reliability in the imprecise environment via genetic algorithm. International Journal of Swarm Intelligence Research, 13(1), 1–21. https://doi.org/10.4018/IJSIR.2022010101

57. Sahoo, L. (2022). Similarity measures for Fermatean fuzzy sets and its applications in group decision-making. Decision Science Letters, 11, 167–180. https://doi.org/10.5267/j.dsl.2022.2.001

56. Sahoo, L. (2021). A new score function based Fermatean fuzzy transportation problem. Results in Control and Optimization, 4, 100040. https://doi.org/10.1016/j.rcon.2021.100040

55. Sahoo, L. (2021). Some score functions on Fermatean fuzzy sets and its application to bride selection based on TOPSIS method. International Journal of Fuzzy System Applications, 10(3), 18–29. https://doi.org/10.4018/IJFSA.2021070102

54. Sahoo, L., & Bhunia, A. K. (2021). Optimization of plant location problem in interval domain via particle swarm optimization. International Journal of System Assurance Engineering and Management, 12(6), 1094–1105. https://doi.org/10.1007/s13198-020-01058-6

53. Sahoo, L. (2019). Solving matrix game with linguistic payoffs. International Journal of System Assurance Engineering and Management, 10, 484–490. https://doi.org/10.1007/s13198-019-00846-8

52. Shaikh, A. A., Bhunia, A. K., Barron, L. E. C., Sahoo, L., & Tiwari, S. (2018). A fuzzy inventory model for deteriorating item with variable demand, permissible delay in payments and partial backlogging with shortage follows inventory (SFI) policy. International Journal of Fuzzy Systems, 20, 1606–1623. https://doi.org/10.1007/s40815-018-0485-1

51. Sahoo, L., & Mahato, S. K. (2018). Optimal redundancy allocation for bridge network system with fuzzy parameters. Journal of Applied Quantitative Methods, 13(1), 1–13.

50. Sahoo, L. (2017). Genetic algorithm based approach for reliability redundancy allocation problems in fuzzy environment. International Journal of Mathematical, Engineering and Management Science, 2(4), 272–283. https://doi.org/10.1016/j.ijmems.2017.06.005

49. Bhunia, A. K., Duary, A., & Sahoo, L. (2017). A genetic algorithm based hybrid approach for reliability-redundancy optimization problem of a series system with multiple-choice. International Journal of Mathematical, Engineering and Management Science, 2(3), 185–212. https://doi.org/10.1016/j.ijmems.2017.07.001

48. Sahoo, L., & Ghosh, S. K. (2017). Solving assignment problem with linguistic costs. Journal of New Theory, 17, 26–37.

47. Sahoo, L. (2017). Solving job sequencing problems with fuzzy processing times. International Journal of Advance Research and Innovative Ideas in Education, 3(4), 3326–3329.

46. Sahoo, L. (2017). An application of interval system of linear equations in circuit analysis. International Journal of Advance Research and Innovative Ideas in Education, 3(4), 2779–2784.

45. Sahoo, L. (2017). An approach for solving fuzzy matrix games using signed distance method. Journal of Information and Computing Science, 12(1), 073–080.

44. Sahoo, L., Mahato, S. K., & Bhunia, A. K. (2016). Genetic algorithm for reliability optimization of redundancy allocation problem in imprecise environment. Fuzzy Information and Engineering. [Accepted for publication]

43. Bhunia, A. K., Shaikh, A. A., & Sahoo, L. (2016). A two-warehouse inventory model for deteriorating item under permissible delay in payment via particle swarm optimization. International Journal of Logistic and System Management, 24(1), 45–69.

42. Sahoo, L. (2016). An interval parametric technique for solving fuzzy matrix games. Elixir Applied Mathematics, 93, 39392–39397.

41. Sahoo, L. (2015). Effect of defuzzification methods in solving fuzzy matrix games. Journal of New Theory, 8, 51–64.

40. Sahoo, L., Mahato, S. K., & Bhunia, A. K. (2015). Multi-level reliability redundancy allocation problem in interval environment via genetic algorithm. Communications in Dependability and Quality Management, 18(1), 65–80.

39. Bhunia, A. K., Biswas, A., & Sahoo, L. (2015). Comparison of different approaches for redundancy allocation problem with interval valued reliability via genetic algorithm. Communications in Dependability and Quality Management, 18(4), 33–51.

38. Sahoo, L. (2015). Genetic algorithm approach to solve integer nonlinear programming problem in reliability optimization. Journal of Information and Computing Science, 10(4), 255–264.

37. Sahoo, L., Banerjee, A., Bhunia, A. K., & Chattopadhyay, S. (2014). An efficient GA-PSO approach for solving mixed-integer nonlinear programming problem in reliability optimization. Swarm and Evolutionary Computations, 19, 43–51.

36. Sahoo, L., Bhunia, A. K., & Roy, D. (2014). Reliability optimization in stochastic domain via genetic algorithm. International Journal of Quality & Reliability Management, 31(6), 698–717.

35. Sahoo, L., Mahato, S. K., & Bhunia, A. K. (2014). Optimization of system reliability for series system with fuzzy component reliabilities by genetic algorithm. Journal of Uncertain Systems, 8, 136–148.

34. Sahoo, L., Bhunia, A. K., & Roy, D. (2014). Reliability optimization with high- and low-level redundancies in interval environment via genetic algorithm. International Journal of Systems Assurance Engineering and Management, 5(4), 513–522.

33. Sen, N., Sahoo, L., & Bhunia, A. K. (2014). An application of integer linear programming problem in tea industry of Barak Valley of Assam, India under crisp and fuzzy environments. Journal of Information and Computing Science, 9(2), 132–140.

32. Sahoo, L., Bhunia, A. K., Pal, D., & Mandal, B. (2013). Alternative approach for PDE-constrained optimization via genetic algorithm. Journal of Information and Computing Science, 8(1), 2041–2054.

31. Bhunia, A. K., & Sahoo, L. (2013). Optimization of constrained multi-objective reliability problems with interval valued reliability of components via genetic algorithm. Indian Journal of Industrial & Applied Mathematics, 3(1), 25–44.

30. Mahato, S. K., Sahoo, L., & Bhunia, A. K. (2013). Effects of defuzzification methods in redundancy allocation problem with fuzzy valued reliabilities via genetic algorithm. International Journal of Information and Computer Science, 2(6), 106–115.

29. Mahato, S. K., Sahoo, L., & Bhunia, A. K. (2012). Reliability-redundancy optimization problem with interval valued reliabilities of components via genetic algorithm. Journal of Information and Computing Science, 7(4), 284–295.

28. Sahoo, L., Bhunia, A. K., & Kapur, P. K. (2012). Genetic algorithm based multi-objective reliability optimization in interval environment. Computers and Industrial Engineering, 62, 152–160.

27. Sahoo, L., Bhunia, A. K., & Roy, D. (2012). An application of genetic algorithm in solving reliability optimization problem under interval component Weibull parameters. Mexican Journal of Operations Research, 1(1), 2–19.

26. Bhunia, A. K., Sahoo, L., & Roy, D. (2010). Reliability stochastic optimization for a series system with interval component reliability via genetic algorithm. Applied Mathematics and Computation, 216(3), 929–939.

25. Sahoo, L., Bhunia, A. K., & Roy, D. (2010). A genetic algorithm based reliability redundancy optimization for interval valued reliabilities of components. Journal of Applied Quantitative Methods, 5(2), 270–287.

24. Sadhukhan, D., Sahoo, L., Mondal, B., & Maiti, M. (2010). Food chain model with optimal harvesting in fuzzy environment. Journal of Applied Mathematics and Computing, 34, 1–18.

List of Book Chapters:

23. Bhattacharjee, N., Sen, N., Nath, P. K., & Sahoo, L. (Accepted). Imperfect production inventory under multi-production cycle for non-deteriorating items with carbon tax and green investment. In Decision making under uncertainty via optimisation, modelling, and analysis (Sahoo et al.). Springer. [In press].

22. Bhattacharjee, N., Sen, N., & Sahoo, L. (Accepted). Root hair algorithm: A swarm intelligence algorithm. In Decision making under uncertainty via optimisation, modelling, and analysis (Sahoo et al.). Springer. [In press].

21. Bhowmik, A., Pal, M., Sahoo, L., & Samanta, S. (2023). A study on developments of fuzzy set and its extensions. In Optimization techniques for sustainable environment under uncertainty (Kulkarni et al.). Springer. [Accepted].

20. Sahoo, L., Rana, A., & Senapati, T. (2022). Score function based effective ranking of interval valued Fermatean fuzzy sets and its applications. In Real life applications of multiple criteria decision-making techniques in fuzzy domain (Sahoo et al.). Springer. ISBN: 978-981-19-4928-9.

19. Maitra, S., Sahoo, L., Lahiri Dey, J., & Tiwary, K. S. (2022). Multi-criteria decision making and its application to online learning platform selection during the Covid-19 pandemic based on TOPSIS method. In Real life applications of multiple criteria decision-making techniques in fuzzy domain (Sahoo et al.). Springer. ISBN: 978-981-19-4928-9.

18. Sahoo, L., Sen, S., & Tiwary, K. S. (2022). Optimization of data packets in memoryless parallel servers under uncertainty. In Supply chain finance modelling and optimization (Shaikh et al.). Springer. [Accepted].

17. Sahoo, L. (2021). Reliability redundancy allocation problems under fuzziness using genetic algorithm and dual connection numbers. In Nature-inspired computing paradigms in systems (Eds. Mellal et al., pp. 11-125). Elsevier.

16. Sahoo, L. (2021). A brief discussion about search engine optimization. In Foundation and emergence of computing and communications (Eds. P. K. Paul et al.). New Delhi. ISBN: 978-948993-9-6.

15. Sahoo, L. (2020). Method for solving intuitionistic fuzzy assignment problem. In Soft computing (Eds. Ram et al., pp. 155-164). De Gruyter.

14. Sahoo, L. (2019). Solutions of fuzzy system of linear equations. In Emerging applications of fuzzy algebraic structures (Eds. C Jana et al., pp. 26-33). IGI Global. DOI: 10.4018/978-1-7998-0190-0.ch002.

13. Sahoo, L., & Pal, P. (2019). Solving (2 × n) fuzzy matrix games. In U. Biswas, A. Banerjee, S. Pal, A. Biswas, D. Sarkar, & S. Haldar (Eds.), Advances in computer, communication and control (Vol. 41, pp. 633-641). Springer. https://doi.org/10.1007/978-981-13-3122-0_41.

12. Sahoo, L. (2018). System reliability optimization in a fuzzy environment via hybridized GA–PSO. In System reliability management: Solutions and technologies (Eds. A. Anand et al., pp. 35-49). CRC Press: Taylor & Francis Group.

11. Bhunia, A. K., Sahoo, L., & Mahato, S. K. (2015). Chance constrained redundancy allocation problem with imprecise component reliabilities via genetic algorithm: A simulation-based approach. In Quality, reliability, infocom technology and industrial technology management (pp. 55-71). I. K. International Publishing House.

10. Sahoo, L., Banerjee, A., Bhunia, A. K., & Chattopadhyay, S. (2014). Reliability redundancy allocation problem of series system by hybrid GA-PSO approach. In ETES 2014 (pp. 83-89). McGraw Hill Education. ISBN-13: 978-93-392-0316-0.

9. Sahoo, L., & Bala, S. (2014). Genetic algorithm to solve integer programming problem in reliability optimization. In ETES 2014 (pp. 99-103). McGraw Hill Education. ISBN-13: 978-93-392-0316-0.

8. Bhunia, A. K., Sahoo, L., & Roy, D. (2012). Genetic algorithm based mixed-integer nonlinear programming in reliability optimization problems. In Quality, reliability and infocom technology: Trends and future directions (pp. 25-42). Narosa Publishing House.

7. Bhunia, A. K., & Sahoo, L. (2011). Genetic algorithm-based reliability optimization in interval environment. In Innovative computing methods (Eds. N. Nedjah et al., pp. 13-36). Springer.

6. Bhunia, A. K., & Sahoo, L. (2011). Reliability optimization in imprecise environment via genetic algorithm. In AMOC 2011 (pp. 372-379). IIT Roorkee.

5. Sahoo, L., & Bhunia, A. K. (2011). Optimization of high- and low-level redundancies via genetic algorithm with interval valued reliabilities. In AMOC 2011 (pp. 380-387). IIT Roorkee.

Text Books Publications:

4. Bhunia, A. K., Sahoo, L., & Shaikh, A. A. (2020). Advanced optimization and operations research. Springer Nature. ISBN-978-981-32-9966-5.

3. Bhunia, A. K., & Sahoo, L. (2011). Advanced operations research. Asian Books Private Limited.

Edited Volume:

2. Sahoo, L., Senapati, T., & Yager, R. R. (Accepted). Decision making under uncertainty via optimisation, modelling, and analysis. Springer.

1. Sahoo, L., Senapati, T., & Yager, R. R. (2022). Real life applications of multiple criteria decision-making techniques in fuzzy domain (Vol. 420). Springer. ISBN: 978-981-19-4928-9.