Dr. Monica Rani

Assistant Professor, Department of Mathematics

Email id: monicagoyal003@gmail.com, monicaiitr@gmail.com

Qualification: Ph.D (Mathematics) from IIT Roorkee
Reliability Optimization of some Industrial systems using Artificial Bee Colony technique.

Research Interest

Reliability optimization, Computational Intelligence, Optimization techniques, fuzzy and intuitionistic fuzzy set theory. Application areas include wide range of industrial and structural engineering design problems.

Subjects Taught

Mathematical Finance, Partial Differential Equations, Calculus, Computer Algebra System and Related Softwares, Mathematical Modelling, Engineering Mathematics, Algebra and Number Theory, Probability and Queuing Theory, Statistical Methods for Engineers, Probability and Statistics.

Research Publication (Total Publication: 24)

Paper published/accepted in	Number of papers
International Journals	18
International Conferences	4
Book Chapter	2

Book Chapter

1. "Reliability optimization through redundancy allocation models with fuzzy uncertainty", Inter-disciplinary Mathematical Sciences, (to appear in 2019)

2. "Predicting uncertain behavior and Performance analysis of the Pulping system in a Paper Industry using PSO and fuzzy methodology"", Handbook of Research on Novel Soft Computing Intelligent Algorithms: Theory and Practical Applications, IGI Global USA, (Ed.) P. Vasant, pp. 414 - 449, DOI: 10.4018/978-1-4666-4450-2.ch014, ISBN13:

9781466644502, ISBN10: 1466644508, EISBN13: 9781466644519. (With S.P Sharma and Harish Garg)

Paper Published in International Journals

1. Reliability optimization of Sugar mill using Markov Approach, ISA Transactions, Elsevier, 0019-0578 **(SCI: Impact Factor: 4.343)** (to appear in 2019)
2. Cost Minimization of butter-oil processing plant using artificial bee colony technique, Mathematics and Computers in Simulations, Elsevier, 97C, pp. 94 - 107, 2014, **(SCI: Impact Factor: 1.409)** (With S.P Sharma and Harish Garg)
3. An approach for analyzing the reliability of industrial systems using soft-computing based technique, Experts Systems with Applications, Elsevier, 41 (2). pp. 489 - 501, 2014, **(SCI: Impact Factor: 4.292)** (With S.P Sharma and Harish Garg)
4. Performance analysis of repairable industrial systems using aritificial bee colony and fuzzy methodology, International Journal of Artificial Intelligence Tools, World-Scientific, 23 (5), 1450008 (23 pages), 2014 **(SCI: Impact Factor: 0.849)** (With S.P Sharma and Harish Garg)
5. Intuitionistic fuzzy optimization technique for solving multi-objective reliability optimization problems in interval environment, Expert Systems with Applications, Elsevier, 41 (7), pp. 3157 - 3167, 2014 **(SCI: Impact Factor: 4.292)** (With S.P Sharma and Harish Garg)
6. Bi-objective optimization of the reliability-redundancy allocation problem for series-parallel system, Journal of Manufacturing System, Elsevier, 33(3),pp. 335 - 347, 2014 **(SCI: Impact Factor: 3.642)** (With S.P Sharma and Harish Garg)
7. "An approach for reliability analysis of industrial systems using PSO and IFS technique", ISA Transaction, Elsevier, 52(6), pp. 701 - 710, 2013. **(SCI: Impact Factor: 4.343)** (With S.P Sharma and Harish Garg)
8. Weibull fuzzy probability distribution for analyzing the behavior of pulping unit in a paper industry, International Journal of Industrial and Systems Engineering, Inderscience, 14(4), pp. 395 - 413, 2013. (With S.P Sharma and Harish Garg)
9. "Preventive maintenance scheduling of the pulping unit in a paper mill", Japan Journal of Industrial and Applied Mathematics, Springer,30(2), pp. 397 - 414, 2013, **(SCI: Impact Factor: 0.377)** (With S.P Sharma and Harish Garg)
10. 'Reliability analysis of the engineering systems using intuitionistic fuzzy set theory, International Journal of Quality and Reliability Engineering, Hindawi, Volume 2013 (2013), Article ID 943972, 10 pages, http://dx.doi.org/10.1155/2013/943972. (With S.P Sharma and Harish Garg)
11. A novel approach for analyzing the behavior of repairable systems by utilizing uncertain data, International Journal of Performability Engineering, RAMS Consultant, 9(2), 201-210, 2013. (With S.P Sharma and Harish Garg)
12. Predicting uncertain behavior of press unit in a paper industry using artificial bee colony and fuzzy lambda-tau methodology, Applied Soft Computing, 13(4), 1869- 1881, 2013, Elsevier **(SCI: Impact Factor: 4.873)** (With S.P Sharma and Harish Garg)

13. Stochastic behavior analysis of an Industrial system using PSOBLT technique, International Journal of Fuzziness and Knowledge based systems, World Scientific, 20(5), 741 -761, 2012. **(SCI: Impact Factor: 1.286)** (With S.P Sharma and Harish Garg)
14. 'An efficient two phase approach for solving reliability-redundancy allocation problem using artificial bee colony technique', Computers and Operations Research, Elsevier, 40 (12), pp. 2961 - 2969, 2013. **(SCI: Impact Factor: 3.002)** (With S.P Sharma and Harish Garg)
15. Behavior analysis of pulping unit in a paper mill with Weibull fuzzy distribution function using ABCBLT technique, International Journal of Applied Mathematics and Mechanics, 8(4), 86 -96, 2012. (With S.P Sharma and Harish Garg)
16. Cost minimization of washing unit in a paper mill using artificial bee colony technique, International Journal of Systems Assurance Engineering and Management, Springer, 3(4), 371- 381, 2012. (With S.P Sharma and Harish Garg)
17. Fuzzy RAM analysis of the screening unit in a paper industry by utilizing uncertain data, International Journal of Quality, Statistics and Reliability, Hindawi, Vol. 2012, Article ID 203842, 14 pages, 2012. (With S.P Sharma and Harish Garg)
18. Availability redundancy allocation of washing unit in a paper mill utilizing uncertain data, Elixir Mechanical Engineering, 39C, 4627- 4630, 2011. (With S.P Sharma and Harish Garg)

Paper published in International Conferences

1. "*Reliability Redundancy allocation problem of the pharmaceutical plant using artificial bee colony technique*", proceeding in International Conference on Advances in Modeling, Optimization and Computing (AMOC 2011) held at IIT Roorkee, Roorkee, India, December 5-7, 2011, pp 560-567. (With S.P Sharma and Harish Garg)
2. "*Reliability analysis of a Press unit in a paper mill using Weibull fuzzy distribution function*", accepted for proceeding of 16th online conference WSC-2011, December 5-16, 2011, published in "Soft Computing in Industrial Application", Springer. (With S.P Sharma and Harish Garg)
3. "*Reliability analysis of press unit using vague set*", proceeding in International Conference on Applied Mathematics And Numerical Analysis (ICAMNA) 2012, held at Paris, France, June 27-28, 2012, Issue 66, pp 649-655. (With S.P Sharma)
4. "*Behavior analysis of the Washing unit using Artificial bee colony technique and vague set theory*", proceeding in The Eighth Imacs International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and theory, held at Athens, Georgia, March 25-28, 2013. (With S.P Sharma)

Conferences/Workshop Attended

❖ Participated in FDP cum workshop on Climate across the curriculum: educational resources for teachers held at Jesus & Mary College on 28 January 2019.
❖ International Conference on Applied Mathematics and Numerical Analysis (ICAMNA) held at Paris, France, June 27-28, 2012.

- ❖ Attended 16th World conference on Soft Computing in Industrial Applications (WSC16) held on the Internet from 5th to 16th December 2011.
- ❖ International Conference on Advances in Modeling, Optimization and Computing (AMOC 2011) held at IIT Roorkee, Roorkee, India, December 5-7, 2011.
- ❖ Attended a National Workshop on Modeling and Optimization held at Maharshi Dayanand University Rohtak, Haryana, August 17-21, 2010.

Participation in other college activities

- ❖ Delivered Lecture on Logistic Regression in workshop on Regression Analysis using R held at Jesus & Mary college, New Delhi 2019

- ❖ Member, Hindi Debating Society

Membership of Professional Bodies

- Life Member of IAENG whose membership No. is 113863.

- Life Member of IACSIT whose membership No. is 80342728

- Associate Member of UACEE whose membership No. is SM1002960

- Member of Bernoulli Society membership number is 15609

- Member of Science and Engineering Institute (SCIEI) whose membership number is 20130527001