Harish Garg (Dr.), PhD

Assistant Professor,
School of Mathematics & Computer Applications,
Thapar University, Patiala, Punjab, India.
Email: harishg58iitr@gmail.com
URL: https://sites.google.com/site/harishg58iitr/

Official address:
School of Mathematics and Computer Applications
Thapar University, Patiala
P.O. Box. 32
Patiala 147004, Punjab, India
Tel: +91 8699031147

Permanent address:
H. No. 58, Majithia Enclave
Phase 2
Patiala, Punjab, India
Postal Code: 147005
Tel: +91 8699031147

Interest:

Research	• Reliability Analysis • Multi-criteria decision making • Fuzzy set theory • Soft computing Technique (GA, PSO, ABC, ANN etc.) • Evolutionary Algorithms • Inventory Problems • Maintenance analysis • Fuzzy optimization • Expert systems
Teaching	• Optimization Technique • Statistics Methods & Algorithms • Numerical Methods • Computational Algorithm in Optimization • Engineering Mathematics • Artificial Intelligence • Differential Equations • Fuzzy Optimization

Professional Experience:

June 17, 2014 – till date	**Assistant Professor** • *Institute:* School of Mathematics and Computer Applications, Thapar University, Patiala, Punjab, India • *Duties:* Teaching Undergraduate and Post Graduate students and responsible for carrying out innovative and insightful research in the area of reliability theory using Evolutionary algorithm and fuzzy set theory with their application in numerous industrial engineering areas.
July 19, 2013 – June 16, 2014	**Lecturer** • *Institute:* School of Mathematics and Computer Applications, Thapar University, Patiala, Punjab, India • *Duties:* Teaching Undergraduate and Post Graduate students and responsible for carrying out innovative and insightful research in the area of reliability theory using Evolutionary algorithm and fuzzy set theory.

2009 – 2013	**Teaching Assistant** • *Institute:* Department of Mathematics, Indian Institute of Technology Roorkee, Roorkee, Uttarakhand, India • *Duties:* Responsible for conducting tutorials for graduate and under-graduate students for Engineering Mathematics, Numerical analysis, Optimization technique.
2009 – 2013	**Research Fellow** • *Institute:* Department of Mathematics, Indian Institute of Technology Roorkee, India
July 2008 – Dec. 2008	**Lecturer** • *College:* Department of Mathematics, Multani Mal Modi College, Patiala affiliated with Punjabi University Patiala. • *Duties:* Teaching undergraduate students, BSc, BBA for various disciplines of mathematics subject.

Education:

2009 – 2013	**PhD (Applied Mathematics)** • *Institute:* Indian Institute of Technology Roorkee, Uttarakhand, India • *Department:* Department of Mathematics • *Thesis Title:* Reliability analysis of some industrial systems using soft computing technique. • *Advisor:* Prof. Dr. S.P. Sharma • *Awarded:* July 10, 2013
2006 – 2008	**MSc (Mathematics)** • *Institute:* Punjabi University Patiala, India • *Department:* Department of Mathematics • *Marks:* 75.05%
2003 – 2006	**BSc (Computer Applications)** • *University:* Punjabi University Patiala, India • *College:* Khalsa College Patiala, India • *Marks:* 71.07%
2001 – 2003	**10+2 (Non-Medical)** • *Board:* Punjab School Education Board, Mohali • *Marks:* 77.33%

Awards, Achievement and Memberships:

Awards	• Won 2nd prize and certificate in Scopus, Science direct Quiz held in Mahatma Gandhi Central Library, IIT Roorkee • DST Travel Grant for attending and presenting a research paper in Guanghou, China during November 18 – 20, 2011. • Qualified **CSIR – UGC – JRF** in **June 2010.** • Qualified **CSIR – NET in December 2008.** • Qualified **GATE 2009** with **MATHEMATICS** securing **88.70%** percentile score.

	• Qualified **GATE 2008** with **MATHEMATICS** securing **92.76%** percentile score. • National Mathematics Olympiad Certificate.
Achievements	• Bibliography profile has been selected for inclusion in the *Marquis Who's Who in the World* ® 2013, 2015. • One of my articles with entitles "*Multi-Objective reliability redundancy allocation problem using particle swarm optimization*", published in Computer & Industrial Engineering; Elsevier is appeared on first position in the listing for most downloaded articles. • One of my paper published in MAPAN-Journal of Metrology Society of India with entitle "*Reliability, Availability and Maintainability analysis of Industrial systems using PSO and fuzzy methodology*" has appeared in the Popular content in this Publication. • One of my paper with entitles, "*A Two-phase approach for reliability and maintainability analysis of an industrial system"*, published in International Journal of Reliability, Quality and System Safety, WorldScientific is appeared in the listing of most read article.
Memberships	• Life Member of International Association of Engineering (IAENG) whose membership No is 113861. • Life Member of International Association of Computer Science and Information Technology (IACSIT) whose membership No. is 80341908 • Associate Member of UACEE whose membership No. is AM1002445 • Student Member of Bernoulli Society membership number is 15598 • Member of Science and Engineering Institute (SCIEI) whose membership number is 20130206001

Professional Activities:

Editorial Board Members	• International Journal of Computing and Optimization. • Global Journal of Technology and Optimization • American Journal of Modeling and Optimization. • Computational Research Journal • American Journal of Industrial Engineering • International Journal for Scientific Research and Development • American Journal of Applied Mathematics and Statistics. • Singularities •
Journal Referee Service	• International Journal of Computer Science Issues. • International Journal of Engineering Research. • ISA Transaction, Elsevier. • Applied Soft Computing, Elsevier • International Journal of System Assurance and Management, Springer

- Journal of Intelligent and Fuzzy Systems, IOS Press.
- International Journal of Advanced Computer Science and Applications.

M.Sc. Thesis ***(Completed: 01, Ongoing: 01)***

- **Ansha**, Generalized Parabolic fuzzy numbers and its application, 2014
- **Pavneet Kaur**, Arithmetic Operations using Sigmoidal function under fuzzy environment, *Ongoing 2015.*
-

Publications (*Total: 52 - Book Chapters: 5, Int. Journals: 41 (SCI: 25), Int. Conferences: 6*)

Book Chapters (Under review: 01, Accepted: 03, Published: 02)

Under review

1. **Harish Garg**, Bi-criteria optimization for finding the optimal replacement interval for maintaining the performance of the process industries, in *Modern Optimization Algorithms and Applications in Engineering and Economics, P. Vasant, W. Weber, V.N. Dieu (Ed.).*, **IGI GLOBAL USA.**
2.

Accepted (in press 2015)

3. **Harish Garg**, Fuzzy Inventory model for deteriorating items using different types of lead-time distributions, accepted for publication *in Intelligent Techniques in Engineering Management*, Cengiz Kahraman & Sezi Cevik (Ed.), **SPRINGER**,
4. **Harish Garg**, Modeling and analyzing system failure behavior for reliability analysis using soft computing based techniques, accepted for publication in *Quality and Reliability Management and Its Applications*, H. Pham (Ed.), **SPRINGER,** 2014.
5. **Harish Garg,** Integrated Framework to analyze the Performance of Process Industrial Systems using Fuzzy and Evolutionary algorithm, accepted for publication in *Intelligent Decision making in Quality Management" C. Kahraman and S. Ugurlu (Ed.)*, **SPRINGER**, 2014.

2014

6. **Harish Garg,** A hybrid GA-GSA algorithm for optimizing the performance of an industrial system by utilizing uncertain data, in *Handbook of Research on Artificial Intelligence Techniques and Algorithms*, P. Vasant (Ed.), **IGI Global, USA**, Ch. 20, pp. 625 – 659, 2014.

2013

7. **Harish Garg**, Monica Rani and S.P. Sharma, "Predicting Uncertain Behavior of Complex Repairable Industrial Systems using PSO and Fuzzy Confidence Interval based Methodology", in *Handbook of Research on Novel Soft Computing Intelligent Algorithms : Theory and Practical Applications*, P. Vasant (Ed.), IGI Global USA, pp. 414 – 449, 2013.

Journals (Under review: ---, Accepted: 02, Published: 39)

Accepted (in Press)

1. **Harish Garg,** Multi-Objective optimization problem of system reliability under Intuitionistic fuzzy set environment using Cuckoo search algorithm, *Journal of Intelligent and Fuzzy Systems, IOS Press,* **(Impact Factor: 0.936)**
2. **Harish Garg,** Nikunj Aggarwal and Alka Choubey, Entropy based multi-criteria decision making method under fuzzy environment and unknown attribute weights, *Global Journal of Technology and Optimization, OMICS Group.*
3.

2015

4. **Harish Garg**, Predicting uncertain behavior in critical engineering systems under vague environment, *Journal of Multiple-Valued Logic and Soft Computing*, 25(1), 1 – 20, 2015, Old City Publishers **(Impact Factor: 1.047)**.
5. **Harish Garg**, An approach for solving constrained reliability-redundancy allocation problems using Cuckoo search algorithm, *Beni-Suef University, Journal of Basic and Applied Science*, 4, 14 – 25, 2015, Elsevier.
6. **Harish Garg,** A novel approach for analyzing the reliability of series-parallel system using credibility theory and different types of intuitionistic fuzzy numbers, *Journal of Brazilian Society of Mechanical Sciences and Engineering, Springer* **(Impact Factor: 0.239)**
7. **Harish Garg,** An approach for analyzing the reliability of industrial system using fuzzy Kolmogorov's differential equations, *The Arabian Journal for Science and Engineering*, 40(3), 975 – 987, 2015, *Springer*. doi: 10.1007/s13369-015-1584-2, **(Impact Factor: 0.367)**

2014

8. **Harish Garg**, Analyzing the behavior of an industrial system using fuzzy confidence interval based methodology, *National Academy Science Letters*, 37(4), 359 – 370, 2014, Springer **(Impact Factor: 0.240).**
9. **Harish Garg,** A novel approach for analyzing the behavior of industrial systems using weakest t-norm and intuitionistic fuzzy set theory, *ISA Transaction*, 53, 1199 – 1208, 2014, *Elsevier* **(Impact Factor: 2.256)**.
10. **Harish Garg,** Performance and behavior analysis of repairable industrial systems using Vague Lambda-Tau methodology, *Applied Soft Computing*, 22, 323 – 338, 2014, *Elsevier*.**(Impact Factor: 2.679)**
11. **Harish Garg,** Monica Rani, S.P. Sharma and Yashi Vishwakarma, Bi-objective optimization of the reliability-redundancy allocation problem for series-parallel system, *Journal of Manufacturing Systems*, 33(2), 353 – 367, 2014, *Elsevier* **(Impact Factor: 1.847).**
12. **Harish Garg**, Reliability, availability and maintainability analysis of industrial systems using PSO and fuzzy approach, *MAPAN – Journal of Metrology Society of India*, 29(2), 115 – 129, 2014, Springer. **(Impact Factor: 0.477).**
13. **Harish Garg**, Monica Rani, S.P. Sharma and Yashi Vishwakarma, Intuitionistic fuzzy optimization technique for solving multi-objective reliability optimization problems in interval environment, *Expert Systems with Applications*, 41(7), 3157 – 3167, 2014, Elsevier **(Impact Factor: 1.965)**.
14. **Harish Garg**, Solving structural Engineering Design Optimization Problems using an artificial bee colony algorithm, *Journal of Industrial and Management*

Optimization,10(3), 777 – 794, 2014, AIMS publishers **(Impact Factor: 0.536)**.

15. **Harish Garg**, Monica Rani and S.P. Sharma. An approach for analyzing the reliability of industrial systems using soft computing based technique, *Expert systems with Applications*, 41(2), 489 – 501, 2014, Elsevier. **(Impact Factor: 1.965).**
16. **Harish Garg,** Monica Rani and S.P. Sharma, Performance analysis of industrial systems using artificial bee colony and fuzzy methodology, *International Journal of Artificial Intelligence and tools*, 23 (5), 1450008 (23 pages), 2014, *World Scientific* **(Impact Factor: 0.321).**
17. Monica Rani, **Harish Garg** and S.P. Sharma, Cost minimization of butter-oil processing plant using artificial bee colony technique, *Mathematics and Computers in Simulations*, 97C, 94 – 107, 2014, Elsevier. **(Impact Factor: 0.856)**.

2013

18. **Harish Garg** and Monica Rani. An approach for reliability analysis of industrial systems using PSO and IFS technique, *ISA Transactions*, Elsevier, 52(6), 701 – 710, 2013. **(Impact Factor: 2.256).**
19. **Harish Garg**, Monica Rani and S.P. Sharma, An efficient two-phase approach for solving reliability-redundancy allocation problem using artificial bee colony technique, *Computers and Operations Research*, 40(12), 2961 – 2969, 2013, Elsevier (**Impact Factor: 1.718).**
20. **Harish Garg**. An approach for analyzing fuzzy system reliability using particle swarm optimization and intuitionistic fuzzy set theory, *Journal of Multiple-Valued Logic and Soft Computing*, 21(3 – 4), 335 – 354, 2013, Old City Publishers **(Impact Factor: 0.667)**
21. **Harish Garg**, Monica Rani and S.P. Sharma, Preventive maintenance scheduling of pulping unit in a paper mill, *Japan Journal of Industrial and Applied Mathematics*, 30(2), 397 – 414, 2013, Springer **(Impact Factor: 0.452)**
22. **Harish Garg** and S.P. Sharma, Predicting uncertain behavior of the press unit in a paper mill using PSOBLT technique, *Journal of Intelligent and Fuzzy Systems*, 25(1), 231 – 242, 2013, IOS Press **(Impact Factor 0.936).**
23. **Harish Garg**, Monica Rani and S.P. Sharma, Reliability analysis of the engineering systems using Intuitionistic fuzzy set theory, *International Journal of Quality, Statistics and Reliability*, Volume 2013, Article ID 943972, 10pages, 2013, Hindawi Publishing Corporation.
24. **Harish Garg**, Fuzzy multi-objective reliability optimization problem of industrial systems using particle swarm optimization, *Journal of Industrial Mathematics*, Volume 2013, Article ID 872450, 9 pages, 2013, Hindawi Publishing Corporation.
25. **Harish Garg** and S.P. Sharma, Reliability redundancy allocation problem of pharmaceutical plant, *Journal of Engineering Science and Technology*, 8(2), 190 – 198, 2013.
26. **Harish Garg**, Performance analysis of complex repairable industrial systems using PSO and fuzzy confidence interval based lambda-tau methodology, *ISA Transactions*, 52(2), 171 – 183, 2013, Elsevier, **(Impact Factor: 2.256).**
27. **Harish Garg**, Monica Rani and S.P. Sharma, 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 **(Impact Factor: 2.679).**
28. **Harish Garg** and S.P. Sharma, Multi-objective reliability-redundancy allocation

problem using particle swarm optimization, *Computer and Industrial Engineering*, Elsevier, 64(1), 247 - 255, 2013. **(Impact Factor: 1.690).**

29. Monica Rani, S.P. Sharma and **Harish Garg**, A novel approach for analyzing the behavior of repairable systems by utilizing uncertain data, *International Journal of Performability Engineering*, 9(2), 201 – 210, 2013.
30. **Harish Garg**, S.P. Sharma and Monica Rani. 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), 395 – 413, 2013.
31. **Harish Garg** and S.P. Sharma, Fuzzy multi-objective optimization problem of synthesis unit utilizing uncertain data, *Journal of Uncertain systems*, 7(1), 13 – 21, 2013, World Academic Union Press. U.K.
32. **Harish Garg**, Reliability analysis of repairable systems using Petri nets and vague lambda-tau methodology, *ISA Transactions*, Elsevier, 52(1), 6 – 18, 2013. **(Impact Factor: 2.256)**

2012

33. **Harish Garg**, S.P. Sharma and Monica Rani, Stochastic behavior analysis of an Industrial system using PSOBLT technique, *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, 20(5), 741 – 761, 2012. **(Impact Factor: 1.781)**
34. **Harish Garg**, S.P. Sharma and Monica Rani, 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.
35. **Harish Garg** and S.P. Sharma, Stochastic behavior analysis of complex repairable industrial systems utilizing uncertain data, *ISA Transactions*, 51(6), 752 – 762, 2012, Elsevier **(Impact Factor: 2.256).**
36. **Harish Garg** and S.P. Sharma, A two-phase approach for reliability and maintainability analysis of an industrial system, *International Journal of Reliability, Quality and Safety Engineering*, 19(3) (2012) Article ID: 1250013 (19 pages).
37. **Harish Garg**, S.P. Sharma and Monica Rani, Cost minimization of washing unit in a paper mill using artificial bee colony technique, *International Journal of Systems Assurance Engineering and Management*, 3(4), 371 – 381, 2012, Springer.
38. **Harish Garg**, Monica Rani and S.P. Sharma, Fuzzy RAM analysis of the screening unit in a paper industry by utilizing uncertain data, *International Journal of Quality, Statistics and Reliability*, Hindawi Publishing Corporation, Vol. 2012, Article ID 203842, 14 pages.
39. **Harish Garg** and S.P. Sharma, Behavior analysis of Synthesis unit in Fertilizer Plant, *International Journal of Quality, Reliability and Management*, 29(2), 217 – 232, 2012. Emerald, UK.

2011

40. **Harish Garg** and S.P. Sharma, Multi-objective optimization of crystallization unit in a fertilizer plant using particle swarm optimization, *International Journal of Applied Science and Engineering*, 9(4), 261-276, 2011.
41. S.P. Sharma and **Harish Garg**, Behavior Analysis of Urea Decomposition system in a Fertilizer Plant, *International Journal of Industrial and Systems Engineering*, (8)3, 271 – 297, 2011, Inderscience.

42. Monica Rani, S.P. Sharma and **Harish Garg**, Availability redundancy allocation of washing unit in a paper mill utilizing uncertain data, *Elixir Mechanical Engineering*, 39C, 4627 – 4630, 2011.

Conferences (Under review: --, Accepted: --, Published: 06)

2014

1. **Harish Garg**, "*Inventory model involving variable lead time, back-order discounts and lost sales using PSO*" in 18th online World Conference on Soft computing in Industrial Application (WSC18), December 1-12, 2014, in "Soft Computing in Industrial Application", Springer.

2011

2. **Harish Garg** and S. P. Sharma, "*RAM analysis of a Coal Crushing Unit of a Thermal Power plant using Fuzzy Lambda-Tau Methodology*" proceeding in "1st International conference in Emerging Trends in Mechanical Engineering (ICETME) 2011", held at Thapar University, Patiala, India, February 24-26, 2011, pp. 795 – 802.
3. **Harish Garg** and S.P. Sharma, "*Behavior and system performance optimization for an industrial system by using particle swarm optimization*", proceeding in "2011 IEEE International Conference on Intelligent Computing and Intelligent Systems (ICIS 2011)" held at Guangzhou, China during Nov 18-20, 2011, pp. 237-241.
4. S.P. Sharma, Monica Rani and **Harish Garg**, "*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.
5. Monica Rani, S. P. Sharma and **Harish Garg**, "*Reliability analysis of a Press unit in a paper mill using Weibull fuzzy distribution function*", in: 16th online World Conference on Soft computing in Industrial Application (WSC16), December 5-16, 2011, in "Soft Computing in Industrial Application", Springer. http://wsc16.cs.lboro.ac.uk/conference/sites/default/files/Paper_0.pdf

2009

6. S.P. Sharma, **Harish Garg**, Ajay Kumar, "*Fuzzy System Reliability Analysis of Two Grinding Machine using Fuzzy Lambda-Tau Methodology*" presented in "4th International Conference on Quality, Reliability and Infocom Technology (ICQRIT) 2009", held at University of Delhi, Delhi, India, December 18-20, 2009, pp. 68 – 69.

Conference/Short Term Courses/Workshop Attended:

Workshop

- Attended a National Workshop on Modeling and Optimization held at Maharshi Dayanand University Rohtak, Haryana from August 17-21, 2010.
- DST sponsored Short term course on Nature Inspired Algorithm: Recent Trends, Theory and Applications, held at Institute of Engineers, IIT Roorkee, India from March 25-28, 2011.

Conferences

- Attended 18th World conference on Soft Computing in Industrial Applications (WSC18) held on the Internet from 1th to 12th December 2014.
- 3rd International Conference on Special Functions and Applications (ICSFA 2014) held at Thapar University Patiala, India, October 16 – 18, 2014

- 2011 IEEE International Conference on Intelligent Computing and Intelligent Systems (ICIS 2011)" held at Guangzhou, China from November 18-20, 2011.
- International Conference on Advances in Modeling, Optimization and Computing (AMOC 2011) held at IIT Roorkee, Roorkee, India, December 5-7, 2011.
- Attended 16th World conference on Soft Computing in Industrial Applications (WSC16) held on the Internet from 5th to 16th December 2011.
- 1st International Conference on in Emerging Trends in Mechanical Engineering (ICETME) 2011", held at Thapar University, Patiala, India from February 24-26, 2011.
- 4th International Conference on Quality, Reliability and Infocom Technology (ICQRIT- 2009), University of Delhi, Delhi, India from December 18-20, 2009.

Computer Skill

Software Packages	Latex, TeX, Lyx, MS Office
Programming Language	Matlab, C, C++, Mathematica

Language Efficiency

English	Read, Write, Speak
Hindi	Read, Write, Speak
Punjabi	Read, Write, Speak

Personal Details

Father's Name	Sh. Baldev Krishan Garg
Mother's Name	Smt. Darshana Garg
Date of Birth	March 1, 1986
Nationality	Indian
Gender	Male
Martial Status	Single

References

References are available upon request