KALYANMOY DEB, FACM, FIEEE, FASME
University Distinguished Professor
Koenig Endowed Chair Professor
Department of Electrical and Computer Engineering
Department of Computer Science and Engineering
Department of Mechanical Engineering
Michigan State University
428 S. Shaw Lane, Room 2120 Engg. Building
East Lansing, MI 48824, USA
Tel: 517 432 2144 (office), 517 930 0846 (cell)
Email: kdeb@egr.msu.edu
http://www.egr.msu.edu/~kdeb/

Research Interests: Computational intelligence, Artificial intelligence, Machine learning, Evolutionary computation, Multi-criterion optimization and decision analysis, Data Analytics

Teaching Interests: Evolutionary computation, Multi-Criterion optimization and decision making, AI and Computational intelligence, Machine learning, Programming and Numerical Methods, Fundamental undergraduate courses in computing and engineering disciplines

Education:

Doctor of Philosophy in Engineering Mechanics, University of Alabama, Tuscaloosa, USA, May 1991
'Boolean and floating-point function optimization using messy genetic algorithms'

Master of Science in Engineering Mechanics, University of Alabama, Tuscaloosa, USA
May 1989
'Multi-modal function optimization using genetic algorithms'

Bachelor of Technology in Mechanical Engineering
Indian Institute of Technology Kharagpur, India
May 1985

Work Experience:

University Distinguished Professor, Michigan State University, East Lansing, USA (2021 to present)

Koenig Endowed Chair Professor, Department of Electrical and Computer Engineering, Michigan State University, East Lansing, USA (2011 to present)

Professor, Department of Computer Science and Engineering, Michigan State University, East Lansing, USA (2011 to present)

Professor, Department of Mechanical Engineering, Michigan State University, East Lansing, USA (2011 to present)

Adjunct Professor, Department of Engineering Design, Indian Institute of Technology Madras, India (2023 to Present)

International Visiting Professor, Department of Mechanical Engineering and Department of Computer Science and Engineering, Indian Institute of Technology Kharagpur, India (2015 to 2019)

Adjunct Faculty, Department of Engineering Design, Indian Institute of Technology Madras, India (2023 to Present)

Visiting Distinguished Professor, Department of Information and Service Economy, Aalto University School of Business, Helsinki, Finland (2009 to 2020)

Visiting Professor, Department of Automation Engineering, University of Skövde, Sweden (2009 to Present)

Professor, Department of Mechanical Engineering, IIT Kanpur, India
December 1999 to July 2012

Associate Professor, Department of Mechanical Engineering, IIT Kanpur, India
June 1997 to November 1999

Assistant Professor, Department of Mechanical Engineering, IIT Kanpur, India
January 1993 to May 1997

Visiting research assistant professor, Department of General Engineering
University of Illinois at Urbana-Champaign, USA
April 1991 to November 1992

Assistant Engineer, Engineers India Limited, New Delhi
June 1985 to July 1987

Significant Other Positions/Associations:

Consultant, ArcelorMittal, Spain, January 2018 to Present

Consultant, Siemens PLM, East Lansing, April 2016 to Present

Midland Research Institute for Value Chain Creation (MRIVCC), Midland, Michigan
August 2015 to Present

Finland Distinguished Professor (FiDiPro), Helsinki School of Economics, Finland
June 2007 to May 2009
Supported by Academy of Finland

Visiting Chair Professor of Applied Computing, University of Birmingham, United Kingdom
May 2007 to June 2008

Visiting Professor, Nanyang Technological University, Singapore
May 2006 to July 2007
Supported by a Collaborative A-Star Project

Fredrick Wilhelm Bessel Award Professor, University of Karlsruhe, Germany
June 2003 to November 2003
Supported by Alexander von Humboldt Foundation

Visiting Professor, ETH, Zurich, Switzerland
February 2001 to July 2001
Supported by ETH, Zurich

Humboldt Fellow, University of Dortmund, Germany
June 1998 to July 1999
Supported by Alexander von Humboldt Foundation

Leadership Roles:

Director, Computational Optimization and Innovation (COIN) Laboratory, Michigan State University, 2012 to Present

CIS Representative to IEEE-USA Government Relations Policy Committee on Energy, April 2018 to Present

Chair, IEEE Computational Intelligence Society Pioneer Award Committee, 2022

Member, IEEE Fellows Award Committee, 2018 to Present

Consultant, Academic Advancement Network Committee, Michigan State University (MSU), 2016-18

Thrust Area Leader, NSF Center on BEACON (Evolutionary Computation), MSU, 2013-20

Chair, Promotion and Tenure Committee, Department of Electrical and Computer Engineering, MSU, 2021 to Present

Chair, Graduate Studies Committee, Department of Electrical and Computer Engineering, MSU, 2013-15

Graduate Recruitment Coordinator, Department of Electrical and Computer Engineering, MSU, 2013-15

ECE Committee Members, Promotion and Tenure committee (2015 to Present), Graduate Studies Committee, 2012 to Present

Faculty Mentor, Academy of Global Engagement (AGE), MSU, 2017 to 2019

Chair, Nyquist Endowed Chair Search Committee, Department of Electrical and Computer Engineering, MSU, 2020

Chair, Hong Endowed Chair Search Committee, Department of Electrical and Computer Engineering, MSU, 2020

Member, Koza Endowed Chair Search Committee, MSU, 2015

Member, ME Chair Search Committee, MSU, 2022 to 2023

General Chair, 10th Evolutionary Multi-Criterion Optimization (EMO-2019) Conference, Kellogg Center, MSU, March 2019

Principal Investigator, NSF Center Proposal on AI Institute in Optimization involving 26 faculty members from 6 universities, 2020

Head, Center for Development for Technical Education, IIT Kanpur, India, 2004 to 2008

Founding Chair, EMO Conference Series, Zurich, Switzerland, 2001

Founding Chair, EMO-MCDM Dagstuhl Seminar Series, Saarbrucken, Germany, 2004

Director, Center for Design and Drafting, IIT Kanpur, India, 2006–2011

Director, Kanpur Genetic Algorithms Laboratory (KanGAL), IIT Kanpur, India, 1999-2011

Major Awards/Honors:

ACM Distinguished Lecturer, Association of Computing Machinery (ACM), 2024-26

Top AI Scientist, International Artificial Intelligence Industry Alliance (AIIA), 2023

Fellow, Association of Computing Machinery (ACM), 2023

Fellow, Asia-Pacific Artificial Intelligence Association (AAIA), 2022

Withrow Senior Distinguished Research Scholar Award, College of Engineering,

Michigan State University, 2022

Best Paper Award, 'IEEE Congress on Evolutionary Computation' Conference, Padua, Italy, 2022

University Distinguished Professor, Michigan State University, 2021

IEEE CIS Evolutionary Computation Pioneer Award, Computational Intelligence Society, IEEE, 2018

Lifetime Achievement Award, Clarivate Analytics, 2017

Highly Cited Researcher, Clarivate Analytics, 2017

Outstanding Researcher Award, Soft Computing Research Society (SCRS), 2017

IEEE Transactions on Evolutionary Computation Outstanding Paper s Award, Computational Intelligence Society, IEEE, 2016

SIGEVO Impact Award, ACM Special Interest Group on Evolutionary Computation, ACM, 2016

Best Paper Award, Genetic Algorithms Track at Genetic and Evolutionary Computation Conference (GECCO-2016)

JC Bose Memorial Lecture Award, Indian National Science Academy (INSA). 2016

Eminent Engineer Award, Tripura State Center for The Institution of Engineers (India), 2015

Honorary Life Member of the Soft Computing Research Society, 2015

Distinguished Professor Visitation Program, Mexican Academy of Sciences (AMC) and United States-Mexico Foundation for Science (FUMEC), 2014-15

Fellow, American Society of Mechanical Engineers (ASME), 2014

IEEE CIS Distinguished Lecturer Award, IEEE Computational Intelligence Society, 2014–2016

Honorary Doctorate Degree, Faculty of Information Technology, University of Jyväskylä, Finland, 2013

Wiley Practice Prize, International Society on Multi-Criterion Decision Making (MCDM), 2013

TWAS Prize in Engineering Sciences, The World Academy of Sciences (TWAS), Italy, 2012

Infosys Prize, Infosys Science Foundation, Bangalore, India, 2011

J. C. Bose National Fellowship, Department of Science and Technology, Ministry of Science and Technology, Government of India, New Delhi, India, 2011

Cajastur Mamdani Prize, European Center for Soft Computing, Spain, 2011

Distinguished Alumnus Award, Indian Institute of Technology Kharagpur, 2011

VELUX Foundation Guest Professorship at Technical University of Denmark (DTU), 2011–2012

MCDM Edgeworth-Pareto Award
by International Society on Multiple Criteria Decision Making (MCDM), 2008

Thomson Citation Laureate Award in Computer Science,
Thomson Reuters, 2006

Shanti Swarup Bhatnagar Prize in Engineering Sciences,
Council for Scientific and Industrial Research (CSIR), Government of India, 2005

Deva Raj Endowed Chair Professor at Indian Institute of Technology Kanpur, India, 2007–2010

Gurmukh and Veena Mehta Endowed Chair Professor at Indian Institute of Technology Kanpur, India, 2011–2013

Finland Distinguished Professor (FiDiPro) at Helsinki School of Economics, Academy of Finland, 2007-2009

Fellow, Institute of Electrical and Electronics Engineers (IEEE), 2012

Fellow, Indian National Science Academy (INSA), 2011

Fellow, Indian Academy of Sciences (IASc), 2006

Fellow, Indian National Academy of Engineering (INAE), 2004

Fellow, International Society for Genetic and Evolutionary Algorithms (ISGEC), 2003

Friedrich Wilhelm Bessel Research Award,
Alexander von Humboldt Foundation, Germany, 2002

Humboldt Fellow, Alexander von Humboldt Foundation, Germany
June 1998–July 1999

IEEE CIS Teaching Award, IEEE Computational Intelligence Society, 2009

Most Highly Cited and Current Classic Paper: 2002 IEEE TEC paper on NSGA-II
Essential Science Indicators, Thomson Reuters, 2010

Fast Breaking Paper Award in Engineering: 2002 IEEE TEC paper on NSGA-II
ISI Web of Science's Essential Science Indicators (ESI), Feb 2004

Best Paper Award, 'Multi-Criterion Decision Making (MCDM-2011)' Conference, Jyväskylä, Finland, 2011

Best Paper Award, 'Evolution Artificielle' Conference, Marseille, France, 2003

SIGEVO Executive Committee Member, ACM Special Interest Group on Evolutionary Computation, 2007–2013

Executive Council Member, International Society on Genetic and Evolutionary Algorithms (ISGEC) (one of 15 members worldwide and alone from India), Since 1999

INAE Young Engineer Award, Indian National Academy of Engineering, 1996

AICTE Career Award for Young Teachers, All India Council for Technical Education, 1996-97

DST Young Scientist Project Award, Department of Science and Technology, India, June 1994

Graduate Research Council Fellowship, University of Alabama, Tuscaloosa, USA
August 1989 - May 1991 (2 consecutive years)

Jefferson Goblet Student Award (April 1990)
31t Structures, Structural Dynamics, and Materials Conference

AIAA/ASME/ASCE/ASC/AHS, Long Beach, California

Outstanding Graduate Research Assistant
Department of Engineering Mechanics, University of Alabama, Tuscaloosa, USA
1989-1990, 1990-1991

Outstanding Master's Thesis Award (1989-1990)
College of Engineering and Department of Engineering Mechanics
University of Alabama, Tuscaloosa, USA

First prize in All India Students Design Competition (August, 1995)
Institution of Engineers, India
'Design a machine to drill polygonal (square, hexagonal) holes'

Best Student in Mechanical Engineering (Amlan Sen Memorial Award) (1985)
Best Student in Industrial Management Program (1985)
Indian Institute of Technology Kharagpur

Journal Board Membership:

Advisory Board Member, Evolutionary Computation Journal, MIT Press,
2002 to Present

Editorial Advisory Board Member, Engineering Optimization Journal, Tailor and Francis, 2003 to Present

Editorial Board Member, Genetic Programming and Evolvable Machines
Springer, 2003 to Present

Editorial Board Member, International Journal of Systems, Signals, Control and Engineering Applications,
Medwell Journals, 2008 to Present

Editorial Advisory Board member, Swarm and Evolutionary Computation, Elsevier,
2010 to Present

Editorial Board Member, Smart Grid and Renewable Energy, Scientific Research Publishing, Inc. USA, Since 2010 to Present

Editorial Board Member, Operations Research Perspectives (ORP),
Elsevier, 2013 to Present

Book Series Editor, Genetic and Evolutionary Computation (GEC) book series, Springer.
2018 to Present

Area Editor, Journal of Multi-Criteria Decision Analysis, Wiley, 2009–2018

Associate Editor, IEEE Transaction on Evolutionary Computation. IEEE Press,
1999-2016

Associate Editor, Applied Soft Computing, Elsevier
2009–2014

Associate Editor, Pacific Journal of Optimization, Yokohama Publishers, 2010–2015

Editorial Board Member, Journal of Optimization, Hindawi Publishing Corporation,
2013–2015

Editorial Board Member, Journal of Smart Grid Frontier (SGF), American V-King Scientific Publishing (AVS), 2013-15

Editorial Board Member, Environment, Systems, and Decisions, Springer, 2012-14

Editorial Board Member, European Journal of Operations Research, Elsevier, 2008-12

Editorial Advisory Board Member, Recent Patents on Computer Science, Bentham Science Publishers, Since 2007-09

Editorial Board member, Studies in Engineering and Technology, Redfame Publishing Inc., 2013-15

Editorial Board member, The Scientific World Journal, Hindawi Publishing Corporation, 2013-16

Editorial Board Member, Journal of The Franklin Institute, Elsevier, 2010-20

Editorial Board Member, Journal of Industrial and Management Optimization (JIMO), American Institute of Mathematical Sciences, 2008-10

Editorial Advisory Board Member, International Journal for Simulation, Multidisciplinary Design Optimization, EDP Sciences, 2007-11

Editorial Board Member, Human Systems Management, IOS Press, 2006-15

Editorial Board Member, Journal of Memetic Computing, Springer, 2007-16

Citations and Journal Records:

Google Scholar Citations (as of September 15, 2024): **209,349**, h-Index: **142**
Google Scholar Rankings:
Highest Cited (#1) Researcher in 'Evolutionary Computation'
Highest Cited (#1) Researcher in 'Multi-objective Optimization'
Fourth Most-Cited Researcher in 'Optimization'
26th Most-Cited Researcher in 'Artificial Intelligence'
57th Most-Cited Researcher in 'Machine Learning'

Research Achievements:

- Written **two** text books on optimization:
  1. **Deb, K.** (2001). *Multi-objective optimization using evolutionary algorithms.* Chichester, London: Wiley, (**Third Print**, 517 pages). Also available as a Wiley Singapore Edition in India. (**22,745** GS Citations)
  2. **Deb, K.** (1995). *Optimization for engineering design: Algorithms and examples.* New Delhi: Prentice-Hall, (**Seventh Print**, 382 pages). (**2,139** GS Citations)
- Published **270** international journal papers and **364** international conference papers (total **634** articles so far).
- Published **21** edited books. Also written one Encyclopedia article on genetic algorithms.
- Graduated 36 PhD students and 65 Master's degree (thesis) students. Mentored 11 post-doctoral fellows.
- Invited to deliver **128** keynote/plenary lectures in major international conferences and symposia in the past 20 years. (See page 59).
- Funded Research Projects (partial list):
  - Funded projects from EPA, DARPA, USACE-ERDC-ITL, NSF, Northrup Grumman: Chesapeake Bay Watershed management, TRADES project for structure of structures, Knowledge Informed Tradespace for Resilient Systems (KITRS), NSF Center on Study of Evolution in Action, etc. (2012 to Present)

- Industry projects from Google, Facebook, Ford Motor Company, General Motors Company, ArcelorMittal, IBS Software Services, Siemens, Dow Chemical Company, Volvo Car Corporation Sweden, Hemlock Semiconductors, General Electric, Honda R&D Japan, STMicroelectronics Italy, Orelogy, Australia. (2012 to Present)
  Other collaborations while in India: Tata Steel Jamshedpur, Tata Engg. and Locomotive Company Pune, Hindustan Aeronautics Limited Bangalore, Department of Science and Technology, AICTE, DoE, etc.
- International Collaborative Projects:
  * Alexander von Humboldt Foundation project on 'Real-parameter evolutionary optimization' with Hans-Paul Schwefel, University of Dortmund, Germany, 1998-1999
  * Asia-ITC funded MSc. Program in Natural Computation at the computer science department with Xin Yao, University of Birmingham, UK (2001-02)
  * Alexander von Humboldt Foundation funded Bessel Research Award project on 'Evolutionary multi-criterion optimization' with Juergen Branke and Hartmut Schmeck, University of Karlsruhe, Germany, May-November, 2003
  * A-STAR project entitled 'Evolutionary optimization in data-mining' with P. N. Suganthan, Nanyang Technological University, Singapore, 2005-2007
  * Indo-Portuguese S&T Bilateral Govt. project with Carlos Fonseca, University Algarve, 2003–2006
  * Indo-Swiss S&T Bilateral Govt. project with Eckart Zitzler and Lothar Thiele, ETH Zurich, Switzerland, 2006–2008
  * Academy of Finland funded 'Finland Distinguished Professor (FiDiPro)' project with Kaisa Miettinen, Helsinki School of Economics, Finland, 2007-2009
  * Indo-Portuguese S&T Bilateral Govt. project with Gaspar Cunha, University Minho, 2010–2012
  * VINNOVA funded project on 'Simulation based "Innovization" of Production Systems (SIPS)' with Amos Ng, University of Sköde, Sweden, 2009–2012
  * Academy of Finland project on 'Automated Innovization' with Pekka Korhonen, Aalto University School of Economics, Finland, 2010–2012
  * Danish Council for Strategic Research project entitled 'REWIND: Knowledge based engineering for improved reliability of critical wind turbine components' with Jesper Hattel, Technical University of Denmark (DTU), 2011–2016
  * SPARC project with IIT Roorkee funded by Government of India with Prof. Dhish Saxena and Erik Goodman, 2019–2023.

Further details can be found from web site `http://www.egr.msu.edu/~kdeb` or by personal contact.

Kalyanmoy Deb

KALYANMOY DEB, PhD, FACM, FIEEE, FASME, FNA, FASc, FNAE
University Distinguished Professor
Koenig Endowed Chair Professor
Michigan State University
East Lansing, MI 48824, USA
Email: kdeb@egr.msu.edu
http://www.egr.msu.edu/~kdeb/

Publication Record

Total Google Scholar Citation is **209,349** with a h-index of **142** (September 15, 2024):

Journal Papers:	270
Conference Papers:	364
Total Refereed Publications:	634
Text Books:	2
Edited Books:	21

Books

1. **Deb, K.** (2001). *Multi-objective optimization using evolutionary algorithms.* Chichester, London: Wiley, (**Third Print**, 517 pages). Also available as a Wiley Singapore Edition in India.

2. **Deb, K.** (1995). *Optimization for engineering design: Algorithms and examples.* New Delhi: Prentice-Hall, (**Seventh Print**, 382 pages).

Edited Books

1. Saxena, D. K., Mittal, S., **Deb, K.**, and Goodman, E. (2024). *Machine Learning Assisted Evolutionary Multi-Objective Optimization.* Springer.

2. Gandomi, A., Emrouznejad, A., Jamshidi, M. M., **Deb, K.** and Rahimi, I. (eds.) (2020). *Evolutionary Computation in Scheduling.* Wiley.

3. Banzhaf, W., Cheng, B. H. C., **Deb, K.**, Holekamp, K. E., Lenski, R. E., Ofria, C., Pennock, R. T., Punch, W. F., and Danielle W. J. (eds.) (2020). *Evolution in Action: Past, Present and Future.* Springer.

4. Datta, R. and **Deb, K.** (eds.) (2015). *Evolutionary Constrained Optimization.* New Delhi: Springer (Infosys Science Foundation Series).

5. Wang, L., Ng, A. and **Deb, K.** (eds.) (2011). *Multi-Objective Evolutionary Optimization for Product Design and Manufacturing.* London: Springer-Verlag.

6. Takahashi, R. H. C., **Deb, K.**, Wanner, E. F., Greco, S. (eds.) (2011). *Proceedings of the Sixth International Conference on Evolutionary Multi-Criterion Optimization (EMO-2011)*, Ouro Preto, Brazil (Lecture Notes in Computer Science 6576), Heidelberg: Springer.

7. **Deb, K.**, Bhattacharya, A., Chakraborti, N., Chakroborty, P., Das, S., Dutta, J., Gupta, S. K., Jain, A., Aggarwal, V., Branke, J., Louis, S. J., and Tan, K. C. (eds.) (2010). *Proceedings of Eighth International Conference on Simulated Evolution and Learning.* Kanpur, India. (Lecture Notes in Computer Science 6457), Heidenberg: Springer.

8. Branke, J., **Deb, K.**, Mietinnen, K. and Slowinski, R. (eds.) (2008). Multiobjective optimization: Interactive and evolutionary approaches. Heidelberg, Germany: Springer.

9. Knowles, J., Corne, D. and **Deb, K.** (eds.) (2008). *Multiobjective Problem Solving from Nature: From Concepts to Applications.* Berlin, Germany: Springer.

10. Keijzer, M., Antoniol, G., Congdon, C. B., **Deb, K.**, Doerr, B., Hansen, N., Holmes, J. H., Hornby, G. S., Howard, D., Kennedy, J., KUmar, S., Lobo, F. G., Miller, J. F., Moore, J., Neumann, F., Pelikan, M., Pollack, J., Sastry, K., Stanley, K., Stoica, A., Talbi, E.-G., Wegener, I. (eds.) (2008). *Proceedings of the Tenth International Conference on Genetic and Evolutionary Computation Conference (GECCO-2008)*, New York: ACM Press.

11. Obayashi, S., **Deb, K.**, Poloni, C., Hiroyasu, T., Murata, T. (eds.) (2007). *Proceedings of the Evolutionary Multi-Criterion Optimization: 4th International Conference (EMO-2007)*, (LNCS 4403), Berlin, Germany: Springer.

12. Thierens, D., Beyer, H.-G., Bongard, J., Branke, J., Clark J. A., Cliff, D., Congdon, C. B., **Deb, K.**, Doerr, B., Kovacs, T., Kumar, S. Miller, J. F., Moore, J., Neumann, F., Pelikan, M., Poli, R., Sastry, K., Stanley, K. O., Stutzle, T., Watson, R. A. and Wegener, I. (eds.) (2007). *Proceedings of the Nineth International Conference on Genetic and Evolutionary Computation Conference (GECCO-2007)*, New York: ACM Press.

13. **Deb, K.**, Chakroborty, P., Iyenger, N. G. R. and Gupta, S. K. (eds.) (2007). *Advances in Computational Optimization and its Applications.* Delhi: Universities Press.

14. **Deb, K.**, Poli, R., Banzhaf, W., Beyer, H.-G., Burke, E. K., Darwen, P. J., Dasgupta, D., Floreano, D., Foster, J. A., Harman, M., Holland, O., Lanzi, P. L., Spector, L., Tettamanzi, A., Thierens, D., and Tyrrell, A. M. (eds.) (2004). Proceedings of the Sixth International Conference on Genetic and Evolutionary Computation (GECCO-2004). (Lecture Notes in Computer Science (LNCS 3102 and 3103)), Heidelberg, Germany: Springer.

15. Cant-Paz, E., Foster, J. A., **Deb, K.** and Lawrence, D., Roy, R., O'Reilly, U.-M., Beyer, H.-G., Standish, R., Kendall, G., Wilson, S., Harman, M., Wegener, J., Dasgupta, D., Potter, M. A., Schultz, A. C. (eds.) (2003). Proceedings of the Fifth International Conference on Genetic and Evolutionary Computation (GECCO-2003). Berlin, Germany: Springer-Verlag.

16. Fonseca, C., Fleming, P., Zitzler E., **Deb, K.**, and Thiele, L. (eds.) (2003). Proceedings of the Second Evolutionary Multi-Criterion Optimization (EMO-03) Conference (Lecture Notes in Computer Science (LNCS) 2632), Heidelberg: Springer.

17. Zitzler, E., **Deb, K.**, Thiele, L., Coello, C. and Corne, D. (eds.) (2001). *Evolutionary multi-criterion optimization (Lecture Notes in Computer Science 1993).* Heidelberg: Springer.

18. Schoenauer, M., **Deb, K.**, Rudolph, G., Yao, X., Lutton, E., Merelo, J. J., Schwefel, H.-P. (eds.) (2000). *Parallel Problem Solving from nature VI (Lecture Notes in Computer Science 1917).* Heidelberg: Springer.

19. Koza, J., Banzhaf, W., Chellapilla, K., **Deb, K.** Dorigo, M. Fogel, D., Garzon, M. Goldberg, D., Iba, H. (eds) (1998). *Proceedings of the 1998 genetic programming conference and symposium on genetic algorithms.* San Mateo, CA: Morgan Kaufmann.

20. **Deb, K.** (ed.) (1998). *Genetic algorithms*, A special issue of the *Computer Science and Informatics, 26*(4).

21. Koza, J, **Deb, K.**, Dorigo, M., Fogel, D., Garzon, M., Iba, H., and Riolo, R. (eds.) (1997). *Proceedings of the 1997 genetic programming conference.* San Mateo, CA: Morgan Kaufmann.

Papers in Journals (PUBLISHED)

1. **Deb, K.**, Lopes, C. L., Martins, F. V. C., and Wanner, E. F. (2024). Identifying Pareto Fronts Reliably Using a Multi-Stage Reference-vector-based Framework. *IEEE Transactions on Evolutionary Computation, 28*(1), 252–266.

2. Toscano. G., Razavi, H., Nejadhashemi, A. P., **Deb, K.**, and Linker, L. (2024). Large-scale Multi-objective Optimization for Watershed Planning and Assessment. *IEEE Transactions on Systems, Man, and Cybernetics: Systems, 54*(6), 3471–3483.

3. Kropp, I., Nejadhashemi, A. P. and **Deb, K.** (2024). Improved Evolutionary Operators for Sparse Large-Scale Multiobjective Optimization Problems, *IEEE Transactions on Evolutionary Computation, 28*(2), 460–473.

4. Lu, Z., Cheng, R., Jin, Y., Tan, K. C. and **Deb, K.** (2024). Neural Architecture Search as Multiobjective Optimization Benchmarks: Problem Formulation and Performance Assessment, *IEEE Transactions on Evolutionary Computation, 28*(2), 323–337.

5. Ghosh, A., **Deb, K.**, Averill, R., and Goodman, E. (2024). An Interactive Knowledge-based Multi-objective Evolutionary Algorithm Framework for Practical Optimization Problems. *IEEE Transactions on Evolutionary Computation, 28*(1), 223–237.

6. Dhebar, Y., **Deb, K.**, Nageshrao, S., Zhu, L. and Filev, D. (2024). Towards Interpretable AI Policies using Evolutionary Nonlinear Decision Trees for Discrete Action Systems. *IEEE Transactions on Cybernetics, 54*(1), 50–62.

7. de Winter, R., Milatz, B.,Blank, J., van Steina, N., Bäck, T., and **Deb, K.** (2024). Parallel multi-objective optimization for expensive and inexpensive objectives and constraints. *Swarm and Evolutionary Computation. 86*, 101508.

8. Khoshoo, B., Blank, J., Pham, T. Q., **Deb, K.** and Foster, S. N. (2023). Optimal Design of Electric Machine with Efficient Handling of Constraints and Surrogate Assistance. *Engineering Optimization, 56*(2), 274–292.

9. **Deb, K.** and Ehrgott, M. (2023). On Generalized Dominance Structures for Multi-Objective Optimization. *Mathematical and Computational Applications ,28*(5), 100 (1–31).

10. Yadav, D., Ramu, P., and **Deb, K.** (2023). Visualization-aided Multi-Criteria Decision-Making using Interpretable Self-Organizing Maps. *European Journal of Operational Research, 309*(3), 1183–1200.

11. Guha, R., Suresh, A., Defrain, J., and **Deb, K.** (2023). Machine Learning Based Prediction and Analysis for Virtual Metrology Tasks in Long Manufacturing Processes. *Materials and Manufacturing Processes, 38*(15), 1997–2008.

12. Gupta, P., Pratihar, D. K., and **Deb, K.** (2023). Analysis and Optimization of Gait Cycle of 25-DOF NAO Robot using Particle Swarm Optimization and Genetic Algorithms. *International Journal of Humanoid Robotics, 21*(2), 2350011(1-44).

13. Zhang, Y., Narayanan, S., Cole, D., and **Deb, K.** (2023). Maximizing Disability Diversity, Language Diversity and Productivity: A Study in Apparel Manufacturing. *Production and Operations Management, 32*(12), 3783–3800.

14. Gandomi, A. H., **Deb, K.**, Averill, R. C., Rahnamayan, S., and Omidvar, M. N. (2023). Variable Functioning and Its Application to Large Scale Steel Frame Design Optimization. *Structural and Multidisciplinary Optimization, 66*(1), 13 (1-17). https://doi.org/10.1007/s00158-022-03435-2

15. Ghosh, A., **Deb, K.**, Goodman, E., and Averill, R. (2023). A User-guided Innovization-based Evolutionary Algorithm Framework for Practical Multi-Objective Optimization Problems. *Engineering Optimization, 55*(12), 2084–2096.

16. **Deb, K.**, Lu, Z., Kropp, I., Hernandez-Suarez, J. S., Hussein, R., Miller, S., and Nejadhashemi, A. P. (2023). Minimizing Expected Deviation in Upper-level Outcomes Due to Lower-level Decision-making in Hierarchical Multi-objective Problems. *IEEE Transactions on Evolutionary Computation, 27*(3). 505–519.

17. Lai, L., Fiaschi, L., Cococcioni, M. and **Deb, K.** (2023). Pure and Mixed Lexicographic-Paretian Many-Objective Optimization: State of the Art. *Natural Computing, 22*. 227–242..

18. Mittal, S., Saxena, D. K., **Deb, K.** and Goodman, E. D. (2022). Enhanced *Innovized* Progress Operator for Evolutionary Multi- and Many-objective Optimization. *IEEE Transactions on Evolutionary Computation, 26*(5). 961–975.

19. Mittal, S., Saxena, D. K., **Deb, K.** and Goodman, E. D. (2022). A Learning-based Innovized Progress Operator for Faster Convergence in Evolutionary Multi-objective Optimization. *ACM Transactions on Evolutionary Learning and Optimization, 2*(1), 1–29.

20. Lopes, C, L. V., Martins, F. V. C., Wanner, E. F., and **Deb, K.** (2022). Analyzing Dominance Move (MIP-DoM) Indicator for Multi- and Many-objective Optimization. *IEEE Transactions on Evolutionary Computation, 26*(3). 476–489.

21. Harrison, K., Bidgoli, A. A., Rahnamayan, S. and **Deb, K.** (2022). Image-Based Benchmarking and Visualization for Large-Scale Global Optimization. *Applied Intelligence, 52*(4). 4161–4191.

22. Kesarwani, P. K. Shukla, P., Dutta, J., and **Deb, K.** (2022). Approximations for Pareto and Proper Pareto solutions and their KKT conditions. *Mathematical Methods of Operations Research, 96*. 123–148.

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Papers to be Published in Peer-Reviewed Conference Proceedings

1. Balija, S. and **Deb, K.** (in press). A Mixed Fidelity Evaluation Technique for Efficient Constrained Multi-objective Optimization: First Results. *Proceedings of 13th International Conference on Evolutionary Multi-Criterion Conference (EMO-2025)*, (Canberra, Australia).

2. Khan, A. and **Deb, K.** (in press). Towards an Efficient Innovation Path Seeking Algorithm Using Directed Domination. *Proceedings of 13th International Conference on Evolutionary Multi-Criterion Conference (EMO-2025)*, (Canberra, Australia).

3. Guha, R. and **Deb, K.** (in press). A Multi-Objective Competitive Co-Evolutionary Framework with Progressive Shrinking for Wargame Scenarios. *Proceedings of 13th International Conference on Evolutionary Multi-Criterion Conference (EMO-2025)*, (Canberra, Australia).

4. Yadav, D., Palaniappan, R. and **Deb, K.** (in press). Reliability-based MCDM Using Objective Preferences Under Variable Uncertainty. *Proceedings of 13th International Conference on Evolutionary Multi-Criterion Conference (EMO-2025)*, (Canberra, Australia).

Keynote/Plenary Lectures (since 2004)

1. 23 June, 2004: **Keynote lecture** during 'Hydroinformatics' Conference entitled 'Single and Multi-Objective Optimization Using Evolutionary Algorithms' held in Singapore.

2. 7 August, 2004: **Premier Plenary Lecture** entitled 'Evolutionary Multi-Criterion Optimization' during the 17h International Conference on Multiple Criteria Decision Analysis held in Whistler, British Columbia, Canada.

3. 12 December, 2005: **Keynote lecture** at GM Symposium entitled 'Practical Optimization Methods' held in Bangalore, India.

4. 12 January, 2006: **Plenary lecture** at International workshop on Neural Networks and Genetic Algorithms in Materials Science and Engineering entitled 'Practical Optimization Methods in Engineering Design' held in Kolkata, India.

5. 3 August, 2006: **Keynote lecture** at Second South-Asia Altair CAE Users Conference-2006 entitled 'Deciphering Innovative Design Principles Through Optimization' to be held in Bangalore, India.

6. 18 September, 2006: **Plenary lecture** at Bio-inspired Computing: Theory and Applications (BIC-TA)' entitled 'Evolutionary Multi-Objective Optimization (EMO): An Emerging Field of Computing for Practical Problem-Solving' to be held in Wuhan, China.

7. 3 November, 2006: **Keynote lecture** at the 2006 International Conference on Computational Intelligence and Security (CIS) entitled 'Evolutionary Optimization for Practical Problem-Solving' to be held in Guangzhou, China.

8. 12 February, 2007: **Keynote lecture** at the Water Resources Workshop at the University of Adelaide, Australia entitled 'Evolutionary optimization for engineering systems'.

9. 23 February, 2007: **Keynote lecture** at the Conference on Current Trends in Computing & Bioinformatics at CSJM University, Kanpur entitled 'Soft Computing Methodologies and Their Potential in Science and Technology'.

10. 24 February, 2007: **Vision talk** at the Indo-US Workshop on Soft, Quantum and Nano Computing (SQUAN-2007) at Dayalbagh University, Agra entitled 'Evolutionary Computing for Practical Optimization'.

11. 23 March, 2007: **Keynote lecture** at Global Conference on Production and Industrial Engineering at National Institute of Technology, Jalandhar entitled 'Computational optimization: An indespensible companion to scientists and practitioners'.

12. 17 April, 2007: **Keynote lecture** at the First international Conference Multidisciplinary Design Optimization and Applications entitled 'Evolutionary Multi-Objective Optimization and Applications' held in Besanon, France.

13. 30 August, 2007: **Plenary Talk** on the 'Research Day' at Helsinki School of Economics, Finland, entitled 'Multi-Criterion Optimization and Decision-Making Using Darwinian Evolutionary Principles: Research and Practices of the Past Decade'.

14. 21 September, 2007: **Keynote lecture** at Symposium on Intelligence Computation and Applications (ISICA 2007) to be held in Wuhan, China.

15. 12 December, 2007: **Plenary talk** at 7th International Conference on Optimization: Techniques and Applications (ICOTA-07) held in Kobe, Japan entitled 'Evolutionary Multiobjective Optimization and Decision Making'.

16. 09 January, 2008: **Keynote lecture** at 19th International Conference on Multiple Criteria Decision Making (MCDM) held in Auckland, New Zealand entitled 'Evolution's Niche in Multi-Criterion Optimization'.

17. 30 September, 2008: **Keynote lecture** at Rolls-Royce Aerodynamic Design optimization Seminar (RR-ADOS) to be held in Rolls-Royce in Derby, UK entitled 'Evolutionary Optimization for Practical Problem Solving'.

18. 13 October, 2008: **Keynote lecture** at the 3rd International Conference on Bioinspired Optimization Methods and their Applications (BIOMA-2008) to be held in Ljubliana, Slovenia entitled 'Evolutionary Multi-Objective Optimization and Decision Making'.

19. 07 December, 2008: **Keynote lecture** at the Seventh International Conference on Simulated Evolution And Learning (SEAL'08) to be held in Melbourne, Australia entitled 'Evolutionary Multi-Objective Optimization and Decision Making'.

20. 12 February, 2009: **Keynote lecture** at the Sixth Spanish Conference on Metaheuristics entitled 'Evolutionary Multi-objective Optimization'.

21. 19 May, 2009: **Keynote lecture** at the IEEE Congress on Evolutionary Computation (CEC-2009) to be held in Trondheim, Norway entitled 'Evolution's Niche in Applied Optimization and Informatics'.

22. 4 June, 2009: **Keynote lecture** at Papermaking Research Symposium in Kuopio, Finland entitled 'Evolutionary Optimization in Practice'.

23. 24 April, 2010: **Keynote lecture** at a workshop on 'The Art and Science of Product Development' at General Motors, Bangalore entitled 'Innovization and its application in product design and development'.

24. 15 September, 2010: **Keynote lecture** at 15th FIRA Robot World Cup and Congress at Bangalore, India entitled 'Evolutionary Multi-Objective Optimization and Applications in Games and Robotics'.

25. 16 December, 2010: **Keynote lecture** at International conference on Swarm, Evolutionary and Memetic Computing (SEMCCO 2010) in Chennai, India, entitled 'Evolutionary Multi-Objective Optimization'.

26. 23 March, 2011: **Keynote lecture** at the National Conference on Operations Research Applications in G. L. Bajaj Institute of Technology and Management, Greater Noida, India, entitled 'Evolutionary Optimization in Operations Research'.

27. 14 September 2011: **Plenary lecture** at the International Conference on Evolutionary and Deterministic Methods for Design, Optimization and Control with Applications to Industrial and Societal Problems (EUROGEN-2011), Italian Aerospace Research Center (CIRA), Capua, Italy, entitled 'Multi-Objective Optimization for Engineering Design'.

28. 04 November, 2011: **Plenary lecture** at the Optimization Seminar organized by Vanderplatts Inc. in Detroit, USA entitled 'Evolutionary optimization and its scope in practical problem solving'.

29. 09 November, 2011: **Plenary lecture** at Users' group meeting of ModeFrontier at Detroit, USA entitled 'Innovization: Revealing innovative design principles through multi-objective optimization'.

30. 25 January, 2012: **Keynote lecture** at Dagstuhl Seminar on "Practical Multi-objective Optimization" entitled 'Innovization: Learning Problem Knowledge Through Multi-Objective Optimization' held at Schloss Dagstuhl, Saarbrucken, Germany.

31. 26 February, 2012: **Guest of Honor Lecture** at Central Mechanical and Electrical Research Institute (CMERI), Durgapur, India on 'An Introduction to Evolutionary Multi-objective Optimization'.

32. 17 March, 2012: **Keynote lecture** at the Students Conference on Engineering and Systems (SCES-2012) held at MNNIT, Allahabad, India entitled 'Niches of Evolutionary Optimization in Practice'.

33. 10 July, 2012: **Keynote lecture** at the 14th IPMU conference (International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems) at Catania, Italy on 'Evolutionary Multi-Objective Optimization'.

34. 29 September, 2012: **Keynote lecture** at Fourth Symposium on Search Based Software Engineering (SSBSE 2012) in Riva del Garda, Italy entitled 'Recent Advancements in Evolutionary Multi-objective Optimization'.

35. 20 March, 2013: **Keynote lecture** at Seventh International Conference on Evolutionary Multi-Criterion Optimization (EMO-13) held at University of Sheffield, UK entitled 'Many-Objective Evolutionary Optimization'.

36. 11 January 2014: **Keynote Lecture** at University of Pune, India entitled 'Applied optimization with single and multiple conflicting criteria'.

37. 29 May 2014: **Keynote Lecture** at International Workshop on Optimization in Engineering held at Bankura, India entitled 'Role of optimization in engineering problem solving'.

38. 1 July 2014: **Keynote Lecture** at International Conference on EVOLVE held in Beijing, China entitled 'Uncertainty handling using evolutionary multi-objective optimization'.

39. 8 July 2014: **Invited Lecture** at World Congress on Computational Intelligence (WCCI-2014) held at Beijing, China entitled 'Evolutionary Multi-objective optimization: Two eventful decades and beyond'.

40. 24 September 2014: **Keynote Lecture** at Numerical and Evolutionary Optimization (NEO-2014) Conference held at Mexico City, Mexico entitled 'How Useful Theoretical Optimality Conditions Are in Assessing Numerical and Evolutionary Optimization Algorithms?'.

41. 3 October 2014: **Keynote Lecture** at INFORMS Southeast Michigan Symposium held at Kellogg Center, East Lansing, USA entitled 'Evolutionary multi-criterion optimization and decision-making'.

42. 15 October 2014: **Keynote Lecture** at 'Optimize This!' – Red Cedar Technology Software User's group meeting to be held at Detroit, USA entitled 'Recent developments in evolutionary multi-objective optimization'.

43. 10 December 2014: **Keynote Lecture** at Third International Conference on the Theory and Practice of Natural Computing (TPNC 2014) to be held at Granada, Spain entitled 'Evolutionary multi-criterion optimization and decision-making'.

44. 12 December 2014: **IEEE Distinguished Lecture** at IIT Kanpur, India entitled 'Evolutionary multi-criterion optimization: Introduction to Theories and Applications'.

45. 26 February 2015: **Keynote Lecture** at North American Search Based Software Engineering Symposium (NasBASE-2015) entitled 'Recent Advancement and Applications of Evolutionary Multi-Criterion Optimization in SBSE'.

46. 18 June 2015: **Keynote Lecture** at EVOLVE Conference at Iasi, Romania entitled 'Evolutionary Multi-Objective Optimization and Its Applications'.

47. 22 July 2015: **Institute Lecture** at Indian Institute of Technology Kharagpur, India entitled 'Evolutionary Optimization for Engineering Problem Solving'.

48. 24 July 2015: **Keynote Lecture** at 30th National Convention of Production Engineers and organized by Tripura State Centre of The Institution of Engineers (India) at National Institute of Technology Agartala, India entitled 'Nature's Niche in Applied Problem Solving'.

49. 7 August 2015: **Infosys Lecture** at Indraprastha Institute of Information Technology (IIIT-D), Delhi entitled 'Nature's Niche in Multi-criterion Design and Optimization'.

50. 18 September 2015: **Invited** Lecture during Big Data Analytics conference entitled 'A Dynamic Optimization Framework for Practical Problem Solving' organized by Quicken Loan and Title Source.

51. 25 September 2015: **Ezra Roundtable Systems Engineering Lecture** at Cornell University entitled 'Nature's Niche in Multi-criterion Design and Optimization'.

52. 23 November 2015: **IEEE Distinguished Lecture** at City University of Hong Kong entitled 'Recent Advances in Evolutionary Many-Criterion Optimization'.

53. 24 November 2015: **Keynote Lecture** at Second International Conference on Soft Computing & Machine Intelligence (ISCMI-2015) entitled 'Evolutionary Optimization for Practical Problem Solving'.

54. 26 November 2015: **IEEE Distinguished Lecture** at USTC, Heifei, China entitled 'Advances in Evolutionary Multi-Criterion Optimization and Decision-Making'.

55. 4 February 2016: **Keynote Lecture** at ACALCI, organized by University of New South Wales, Canberra, Australia entitled 'A Theoretical Convergence Measure for Multi-Objective Optimization Algorithms'.

56. 5 February 2016: **Keynote Lecture** at Computational Optimization in Engineering Design Workshop at University of New South Wales, Canberra, Auatralia entitled 'Evolutionary Advances in Evolutionary Many-objective Optimization Methods'.

57. 29 February 2016: **This Weeks Discoveries Series Lecture** at Leiden University entitled 'Breaking the Billion Variable Barrier in Real-World Optimization'.

58. 01 April, 2016: **Beacon Lecture'** at NSF-Beacon Center at MSU entitled 'Breaking the Billion Variable Barrier in Real-World Optimization'.

59. 24 September, 2016: **Keynote Lecture** at IEEE International Conference on Research in Computational Intelligence and Communication Networks (ICRCICN 2016) held at Kolkata, India entitled 'Multi-objective optimization for Computational Intelligence'.

60. 23 September, 2016: **JC Bose Memorial Award Lecture** at Indian Statistical Institute, Kolkata, India entitled 'Optimization via Nature: Principles, Performances, and Promises'.

61. 26 September, 2016: **Institute Lecture** at Indian Institute of Technology Guwahati, India entitled 'Nature Inspired Methods for Optimization'.

62. 12 October 2016: **Keynote Lecture** at 'Optimize This!' Heeds Users Conference entitled 'Visualizing Many-Objective Optimal Solutions for an Informed Decision-Making'.

63. 23 November 2016: **IEEE Distinguished Lecture** at RMIT, Australia and University of Melbourne entitled 'Niches of Population-Based Optimization Algorithms in Practice'.

64. 23 December, 2017: **Keynote Lecture** at 7th International Conference Soft Computing for Problem Solving (SocProS-2017) at IIT Bhubaneswar, India entitled 'Nature's Niche in Optimization Problem Solving'.

65. 9 July, 2018: **Plenary Lecture** at 2018 World Congress on Computational Intelligence (WCCI-2018) held at Rio de Janeiro, Brazil entitled 'The Rise of Evolutionary Multi-Criterion Optimization: Directed or Destined'.

66. 26 July, 2018: **Keynote Lecture** at International Seminar on Intelligent Computing (ISIC-2018) conference at RCC Institute of Information Technology, Kolkata, India entitled 'Rise of Evolutionary Multi-Objective Optimization: Past 25 Years of Research and Application'.

67. 27 July, 2018: **Keynote Lecture** at Second International Conference on Computational Intelligence, Communications, and Business Analytics (CICBA-2018) held at University of Kalyani, India, entitled 'Customized Optimization for Practical Problem Solving.

68. 26 September, 2018: **Keynote Lecture** at Numerical and Evolutionary Optimization (NEO-2018) held at Mexico City, Mexico entitled 'Extreme-Scale Evolutionary Optimization: A Case Study on a Billion-Variable Resource Allocation Problem'.

69. 20 November 2018: **IEEE CIS Disntiguished Lecture** at Indian Institute of Science, Bangalore, India entitled 'Rise of Evolutionary Multi-Criterion Optimization: A 25-Year Perspective'.

70. 20 November, 2018: **Plenary Lecture** at Symposium Series of Computational Intelligence (SSCI-2018) held at Bangalore, India entitled 'Customized Optimization for Practical Problem Solving'.

71. 14 January, 2019: **Invited Lecture** at BioSense Institute, Serbia entitled 'Multi-objective Optimization and Its Application in Precision Irrigation Systems'.

72. 21 March, 2019: **Invited Lecture** at King Mongkut's University (KMUTT), Bangkok, Thailand entitled 'Introduction to Genetic Algorithms and Evolutionary Computing'.

73. 21 March, 2019: **Invited Lecture** at King Mongkut's University (KMUTT), Bangkok, Thailand entitled 'Trends in Multi-Objective Optimization'.

74. 24 March, 2019: **Keynote Lecture** at ISMSI-2019 conference in Male, Maldives entitled 'Customized Metaheuristics for Intelligent System Design'.

75. 25 March, 2019: **Infosys Lecture** at M S Ramaiah University of Applied sciences, Bangalore, India entitled 'Customized Optimization for Practical Problem Solving'.

76. 18 June, 2019: **Keynote Lecture** at Numerical Computations – Theory and Algorithms (NUMTA-2019) Conference at Crotone, Italy entitled 'Karush-Kuhn-Tucker Proximity Measure for Convergence of Real-parameter Single and Multi-objective Optimization'.

77. 21 June, 2019: **IEEE CIS Distinguished Lecture** at Genova, Italy entitled 'Customized Optimization for Practical Problem Solving'.

78. 10 July, 2019: **Invited Lecture** at Department of Mathematics, Indian Institute of Technology Roorkee entitled 'A Theoretical Proximity Measure for Convergence of Single and Multi-Criterion Evolutionary Optimization'.

79. 23 July, 2019: **Institute Lecture** at Indian Institute of Technology Roorkee, India entitled 'Optimization: Scope, Methods, Challenges, and Directions for Practical Problem Solving'.

80. 15 August, 2019: **Invited Lecture** at ASSAR Technology Park Workshop organized at University of Skovde, Sweden entitled 'Large Scale Optimization For Real-World Applications'.

81. 25 September, 2019: **Keynote Lecture** at IPDO Conference in Tianjin, China entitled 'Customized Optimization for Practical Problem Solving'.

82. 16 October, 2019: **Keynote Lecture** at 15th International Congress Technological Trends in Computing (CTTC-2019) in Mexico City entitled 'Advances in Multi-objective Optimization'.

83. 01 November 2019: **Plenary Lecture** Lecture at ICETET-SIM-2019 Conference at G. H. Raisoni College of Engineering, Nagpur, India entitled 'Customized Optimization for Practical Problem Solving'.

84. 15 November 2019: **Invited Lecture** at Workshop on "Emergent Optimization Methods and Applications" at IIT Roorkee Extension, Greater Noida, India entitled 'Engine Design for Six Objectives'.

85. 20 November 2019: **Keynote Lecture** at Internatioonal Conference on Artificial Intelligence and Applications held at College of Engineering Roorkee, India entitled 'Evolutionary Computation and Machine Learning Reinforce Each Other'.

86. 12 December 2019: **Keynote Lecture** at SOM-2019 Conference at IIT Kanpur, India entitled 'Heuristics and Metaheuristics: Applications and Future'.

87. 29 June 2020: **Keynote Lecture** at Deep Learning and Artificial Intelligence Summer School 2020 (DLAI3) at Bangkok, Thailand entitled 'Recent Advances in Evolutionary Multi-Criterion Optimization and Future Studies' (online).

88. 10 July, 2020: **Keynote Lecture** at GECCO-2020 Conference at Cancun, Mexico entitled 'Evolutionary Computation's Niche for Solving Multi-Criterion Optimization Problems' (online).

89. 5 August, 2020: **Plenary Lecture** at International Conference on Modeling, Simulations and Optimizations (CoMSO-2020) at Silchar, India entitled 'Nature's Niche in Solving Multi-Criterion Optimization' (online).

90. 5 September, 2020: **Keynote Lecture** at International Conference on Recent Advances in Computational and Experimental Mechanics (ICRACEM) at IIT Kharagpur entitled 'Advances in Optimization Methods for Engineering Problem Solving' (online).

91. 1 October, 2020: **Invited lecture** at Caterpillar, Chicago entitled 'Interpretable AI-based Policies Using Hierarchical Nonlinear Decision Trees' (online).

92. 25 October, 2020: **Keynote Lecture** at National Conference on Multidisciplinary Design, Analysis and Optimization (NCMDAO-2020) at Trivandrum, India entitled 'A Taxonomy for Surrogate Assisted Multi-objective Optimization' (online).

93. 02 November, 2020: **Keynote Lecture** at The 12th International Joint Conference on Computational Intelligence (IJCCI-2020) at Budapest, Hungary entitled 'Nature-Inspired Multi-Objective Optimization' (online).

94. 18 November, 2020: **Keynote Lecture** at Numerical and Evolutionary Optimization (NEO-2020) Conference at Oaxaca , Mexico entitled 'Evolutionary Multi-Criterion Optimization: Three Decades of Research and Applications' (online).

95. 5 December, 2020: **Keynote Lecture** at 6th International Conference on Big Data and Information Analytics (BigDIA2020) at Beijing, China entitled 'Billion-Dimensional Problem Solving and Information Analytics using Computational Intelligence Methods' (online).

96. 18 December, 2020: **Keynote Lecture** at SocPros-2020 Conference at Indore, India entitled 'Rise of Evolutionary Multi-Criterion Optimization' (online).

97. 29 December, 2020: **Keynote Lecture** at International Conference on Computational Intelligence, Security & IoT (ICCISIoT-2020) Conference at NIT Agartala, India entitled 'Computational Intelligence for Solving Large-Scale Practical Problems' (online).

98. 22 January, 2021: **Keynote Lecture** at Mahindra AFS Technology Symposium, Bangalore, India entitled 'Customized Optimization for Practical Problem Solving' (online).

99. 6 February 2021: **Distinguished Lecture** at Dayalbagh Educational Institute, Agra, India entitled 'Societal Problem Solving involving Many Objectives' (online).

100. 22 February, 2021: **Invited Talk** at Delft Univeristy, The Netherlands entitled 'Optimization and AI Problem Solving with Knowledge'. (online)

101. 26 March, 2021: **Keynote Lecture** at the Virtual International Conference on Soft Computing, Optimization Theory and Applications (SCOTA-2021) entitled 'A Convergence Measure of Single and Multi-Criterion Evolutionary Optimization'. (online)

102. 6 April, 2021: **Keynote Lecture** at the First International Conference on Artificial Intelligence and Data (CAIDA2021) entitled 'Interpretable Artificial Intelligence Policies Using Nonlinear Decision Trees'. (online)

103. 30 April, 2021: **Invited Lecture** at Indian Institute of Technology Jodhpur, India entitled 'Explainable AI (XAI) using Nonlinear Decision Trees'. (online)

104. 28 June, 2021: **Plenary Lecture** at the 14th International Conference on Evolutionary and Deterministic Methods for Design, Optimization and Control (EUROGEN-2021) entitled 'Customized Optimization for Engineering Problem Solving'. (online)

105. 26 August, 2021: **Keynote Lecture** at the Emerging Techniques in Computational Intelligence 2021 Conference entitled 'Multi-Criterion Search and Optimization Using Evolutionary Computation' at Mahindra University, India (online).

106. 01 September, 2021: **Keynote Lecture** at Three-day SPARC workshop at IIT Hyderabad, India entitled 'Uncertainty Handling in Multi-objective and Multi-Level Optimization' at IIT Hyderabad, India (online).

107. 14 December, 2021: **Keynote Lecture** at Third World Congress on Nature and Biologically Inspired Computing (NaBIC-2021) and the 12th International Conference on Soft Computing and Pattern Recognition (SoCPaR-2021) entitled 'Customized Evolutionary Optimization for Practical Problem Solving' at Hyderabad, India (online).

108. 14 May, 2022: **Keynote Lecture** at 11th International Conference on Soft Computing for Problem Solving (SocProS 2022) entitled 'ML-based Optimization for Efficient Applications' at IIT Mandi, India (online).

109. 7 July, 2022: **Keynote Lecture** at International Conference on Advanced Communications and Machine Intelligence (MICA 2022) at Karur, entitled 'Machine Learning for Improving Performance of Evolutionary Optimization' at Tamil Nadu, India (online).

110. 11 July, 2022: **Plenary Lecture** at 14th edition of the Metaheuristics International Conference (MIC-2022) entitled 'Evolutionary Computation's Niche for Multi-Criterion Optimization'.

111. 22 September, 2022: **University Lecture** at Uppsala University, Sweden entitled 'Evolutionary Multi-Criterion Optimization: An Emerging Computational Problem-Solving Tool'.

112. 22 November, 2022: **Keynote Lecture** at 4th International Conference on Emerging Trends in Electrical, Electronic and Communications Engineering (ELECOM-2022) entitled 'Multi-Criterion Optimization in Applied Problem Solving Tasks' at Mauritius.

113. 27 January, 2023: **Keynote Lecture** at the Fifth International Conference on Computational Intelligence in Communications and Business Analytics (CICBA-2023) at Kalyani Government Engineering College, Kalyani entitled 'Evolutionary Multi-Criterion Optimization: An Emerging Computational Problem-Solving Tool' at West Bengal, India (online).

114. 06 February, 2023: **Otto-von-Guericke Lecture** at Otto von Guericke University entitled 'Evolutionary Multi-Criterion Optimization: An Emerging Computational Problem-Solving Tool' at Magdeburg, Germany.

115. 22 March, 2023: **Keynote Lecture** at 12th International Conference Series on Evolutionary Multi-Criterion Optimization (EMO-2023) entitled 'Lessons from 30 Years of EMO: What Lies Ahead?' at Leiden University, The Netherlands.

116. 4 May, 2023: **Keynote Lecture** at NITA-2023 Conference at National Institute of Technology, Agartala entitled 'Knowledge-based Optimization Through Evolutionary Computation' at Agartala, Tripura, India (online).

117. 17 May, 2023: **Plenary Lecture** at Heeds Customer Loyanty Event (CLE), Siemens PLM at Automotive Hall of Fame entitled 'Beyond Optimization' at Dearborn, Michiganm USA.

118. 5 July, 2023: **Keynote Lecture** at Congress on Evolutionary Computation (CEC-2023) entitled '30 Years of EMO: Lessons Learned and Tasks Ahead' at Chicago, USA.

119. 16 July, 2023: **Keynote Lecture** at 4th International Conference and Summer School on Numerical Computations: Theory and Algorithms (NUMTA-2023) entitled 'Pratcical Optimization Using Evolutionary Algorithms' at Calabria, Italy.

120. 22 September, 2023: **Keynote Lecture** at the International Conference on Emerging Techniques in Computational Intelligence entitled 'Advances in Evolutionary Multi-Criterion Optimization' at Mahindra University, Hyderabad, India (online).

121. 5 April, 2024: **Honor's Day Invited Talk** delivered Aerospace Engineering and Mechanics Department entitled Evolution's Niche in Practical Problem-Solving Tasks' at the University of Alabama, Tuscaloosa, USA.

122. 18 May, 2024: **Keynote Lecture** delivered at the Seventh Academic Conference on Intelligent Optimization and Scheduling entitled 'Recent Advances in Multi-Criterion Optimization' at Jiangnan University, China.

123. 04 June 2024: **Keynote Lecture** delivered at the Tunisia Day on Evolutionary Computation (TDEC-2024) entitled 'What Problems are Ideal for Evolutionary Computation?'.

124. 16 August, 2024: **Keynote Lecture** delivered at the "Contemporary Advancement in Multi-objective Optimization' entitled 'Enhancing Performance of Evolutionary 'Multi-objective Optimization Using Machine Learning' at Assam University, Silchar, India.

125. 23 August, 2024: **Keynote Lecture** delivered at the International Conference on Emerging Techniques in Computational Intelligence entitled 'Evolutionary Multi-objective Optimization for Practicalities' at Mahindra University, Hyderabad, India.

126. 04 September, 2024: **Keynote Lecture** delivered at the Numerical and Evolutionary Optimization (NEO-2024) Conference held entitled 'Evolutionary Multi-objective Optimization for Practicalities' at CINEVISTAV, Mexico City, Mexico.

127. 14 December 2024: **Keynote Lecture** to be delivered at the 57th Annual Convention of the Operational Research Society of India (ETBAMS-2024) entitled 'Emerging Trends in Practical Single and Multi-Criterion Problem Solving' at the Indian Institute of Technology Bombay, India.

128. 16 December 2024: **Keynote Lecture** to be delivered at the International Conference on National Conference on Multidisciplinary Design, Analysis and Optimization (iNCMDAO-2024) entitled 'Recent Advances in Multi-Criterion Optimization' at the Indian Institute of Science (IISc) Bangalore, India.

Further details can be provided upon request.