KALYANMOY DEB, PhD, FIEEE, FNA, FASc, FNAE
Department of Mechanical Engineering
Indian Institute of Technology (IIT) Kanpur
Kanpur, PIN 208016, India
E-mail: deb@iitk.ac.in
http://www.iitk.ac.in/kangal/deb.htm

Summary of Achievements

- PhD from University of Alabama, Tuscaloosa, USA in 1991
- Master of Science from University of Alabama, Tuscaloosa, USA in 1989
- Bachelor of Technology (Hons.) from Indian Inst. of Technology Kharagpur, India in 1985
- Worked as as assistant engineer at Engineers India Limited, Delhi (1985-1987)
- Worked as visiting research assistant professor at University of Illinois at Urbana-Champaign during 1991-1992 (1.5 years)
- Assistant Professor (1993-97), Associate Professor (1997-99), Professor (1999-Present) – All tenured positions
- Formerly Deva Raj Endowed Chair Professor at Department of Mechanical Engineering, IIT Kanpur, India, 2007-2010
- Fellow of Indian National Science Academy (INSA), Indian Academy of Science (IASc) and Indian National Academy of Engineering (INAE), three main science and engineering academies in India
- Written **two** sole-authored text books, **116** journal and **188** conference publications (Total **304** published papers)
- ISI Web of Science Citation Count: **17,198** (as of 31 December 2011), Harzing's Publish or Perish Citation Count: **38,810**
- Hirsh Index: **61** according to Harzing's Publish or Perish (31 December 2011)
- Prestigious **Shanti Swarup Bhatnagar Prize** in Engineering Science in 2005 from CSIR, India (Highest and most coveted prize given to at most two scientists below 45 years of age in India every year)
- Research and teaching interests are inter-disciplinary and primarily in the **applied computing** area:
  - Received the prestigious Finland Distinguished Visiting Professor (FiDiPro) position supported by the Academy of Finland and Foundation of Helsinki School of Economics
  - Elected executive committee member of International Society on Multi-Criterion Decision Making (MCDM)
  - **Thomson Citation Laureate Award** for the highest ISI Web of Science citation counts in the computer science category from India during 1996–2005, given in July 2006
  - Fellow of International Society on Genetic and Evolutionary Computation (ISGEC)

- Visiting faculty in Computer Science Department at University of Dortmund, Germany for 14 months (1998-99) on Alexander von Humboldt (AvH) Fellowship
- Visiting Professor at Computer Engineering and Networks Laboratory at ETH Zurich for six months (2001)
- Visiting Professor at the Institute of Applied Informatics and Formal Description Methods at University of Karlsruhe, Germany for six months (2003) on the prestigious Friedrich Wilhelm Bessel Research Award from AvH, Germany
- Visiting Professor in Electrical and Electronics Engineering at NTU Singapore for two months (2006)
- International journal editorships: 18 journals
  - Associate editor of three journals: IEEE Transaction on Evolutionary Computation (IEEE TEC), Applied Soft Computing Journal (Elsevier), and Pacific Journal of Optimization (Yokohama Publishers)
  - Advisory board member of three journals: Evolutionary Computation Journal (MIT Press), Recent Patents on Computer Science (Bentham Science Publishers), International Journal for Simulation, Multidisciplinary Design Optimization (EDP Sciences)
  - Area Editor of Journal of Multiple Criterion Decision Analysis, Wiley
  - Editorial board member of 9 international journals on computing and optimization
- 35 keynote/Plenary lectures in major international conferences (Congress on Evol. Computation, Computational Intelligence and Security, Bio-Inspired Computing etc.)
- 33 invited tutorials on computational optimization in international conferences
- Declared a 'Sociometric Super-star' in the Evolutionary Computation field through a research study by J. J. Merlo for the highest contribution in joint authorship on research papers with a network of researchers across the globe (article appears in http://www.iitk.ac.in/kangal/deb.shtml)
- My multi-criterion evolutionary algorithm (NSGA-II) is the most popularly-used algorithm and has received more than 2,225 ISI citations (4,042 in Google Scholar) on 27 December 2010 and was also judged as the 'fast-breaking paper' by ISI Web of Science in February 2004 (see http://esi-topics.com/fbp/2004/february04-KalyanmoyDeb.html). Recently the paper is awarded as Most Highly Cited Paper and a Recent Classic paper by Thomson Reuters.
- Highly cited papers (according to Google Scholar, 27 December 2010) are as follows:

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NSGA-II (TEC): 4042,     NSGA (ECJ): 2296,       ZDT (ECJ): 1501
NSGA-II (PPSN): 1491,    Selection (FOGA): 1180, mGA (Compl. Sys.): 889
Constraint (CMAME): 776, Multimodal (ICGA): 754, SBX (Compl. Sys.): 612
EMO testprob.(ECJ): 541, Popsize (FOGA): 513,    e-EMO (ECJ): 388
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- A recently published survey article ('Visualizing the Computational Intelligence Field' by van Eck et al.) in Computational Intelligence Magazine (vol 1, issue 4, 2006) features my NSGA-II algorithm as an evolutionary computing algorithm having the largest increase in frequency of usage from 2002 till 2006 in the entire Computational Intelligence field (see http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=10207)
- Co-organizer (with Prof. Xin Yao) of the Asia-ITC funded MSc. Programme in Natural Computation at the computer science department at University of Birmingham (2001-02)
- Completed a three-year long Indo-Portuguese collaborative project with Dr. Carlos Fonseca from Centre for Intelligent Systems, Univ. of Algarve, Portugal
- Completed a two-year long Indo-Swiss collaborative project with Computer Engineering and Networks Laboratory (Prof. Lothar Thiele and Dr. E. Zitzler) at ETH Zurich, Switzerland

  - Computer Science PhD students from different countries (Univ. of Sydney, Australia, Univ. of Karlsruhe, Germany and Univ. of Dortmund, Germany, NTU Singapore, Lappeenranta University of Technology, Finland and others) regularly visit my research laboratory for their thesis work, each staying three to 12 months
  - Examined PhD theses (final defense and review of theses) of many CS students from abroad (Univ. of Reading, Univ. of West of England, Bristol, Univ. of Aalborg, Denmark, ETH Zurich, Univ. of Sydney, Hong Kong Polytechnic and others).
  - Founder and Organizer of two major international conferences: (i) Dagstuhl Seminar on Multi-Criterion Optimization and Decision-making in Schloss Dagstuhl Germany (2004, 2006) and (ii) bi-annual Evol. Multi-Criterion Optimization (EMO) conference (2001, 2003, 2005, 2007).
  - Editor-in-Chief of Genetic and Evolutionary Computation Conference (GECCO-2004) conference proceedings (Springer, two LNCS volumes)
  - Track chair on Genetic Algorithms and EMO during many GECCO conferences and special session chairs on various topics during Congress on Evolutionary Computation (CEC) conferences
  - Chair of the Panel discussion on EMO during World Congress on Computational Intelligence (WCCI-2006).
  - Teaching full semester courses on evolutionary computation, computational optimization, multi-criterion optimization and decision-making, programming and numerical analysis, mathematical methods in engineering, artificial intelligence and other design related courses

- Pioneer and leader in research and development of the Evolutionary Multi-Criterion Optimization (EMO) field (also the founding member of the steering committee on EMO)

- Extensively engaged in governmental and bi-lateral governmental (Indian, Indo-Portugal, Indo-Swiss) and industry-funded research primarily from industries abroad (from General Motors Bangalore and USA, General Electric USA, STMicroelectronics Italy, Honda R&D Japan etc.). Currently all my projects are sponsored by industries, supporting my research laboratory KanGAL and more than 15 students (6 PhD students, 6 master's degree students, and remaining Bachelor's degree students). Eight students are supported by industrial research funding.

- 18 years of teaching experience and 21 years of research experience

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Fax: +91 512 259 7205, 7408, 0007
E-mail: deb@iitk.ac.in
http://www.iitk.ac.in/kangal/deb.htm

Research Interests: Applied Optimization, Evolutionary computation, Soft Computing, Modeling and Simulation, Multi-Criterion Decision Analysis, Optimal Design, Design and Control of Intelligent Systems, Machine learning

Teaching Interests: Applied Optimization, Computational Optimization, Evolutionary Computation, Natural Computation, Computational Intelligence Methodologies, Multi-Criterion Optimization, Programming and Numerical Methods, Mathematics for Engineers, software engineering, search algorithms, Design Methodologies, Systems analysis, Intelligent data analysis

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:

Professor, Department of Mechanical Engineering, IIT Kanpur, India
December 1999 till Present

Adjunct Professor, Department of Information and Service Economy
Aalto University School of Economics, Helsinki, Finland
June 2010 till Present

Visiting Professor, School of Technology and Society, University of Skövde, Sweden
September 2008 till Present

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

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

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

Assistant Engineer, Engineers India Limited, New Delhi

June 1985 till July 1987

Significant Positions in Foreign Universities:

Finland Distinguished Professor (FiDiPro), Helsinki School of Economics, Finland
June 2007 till May 2008
Supported by Academy of Finland

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

Fredrick Wilhelm Bessel Award Professor, University pf Karlsruhe, Germany
June 2003 till November 2006
Supported by Alexander von Humboldt Foundation

Visiting Professor, University of Birmingham, United Kingdom
May 2002 till July 2002

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

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

Major Awards/Honors:

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

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

Cajastur Mamdani Prize, European Centre 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

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

Senior Member, IEEE, since 2002

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

Associate Editor, IEEE Transaction on Evolutionary Computation. IEEE Press,
Since 1999

Associate Editor, Applied Soft Computing, Elsevier
Since 2009

Associate Editor, Pacific Journal of Optimization, Yokohama Publishers, Since 2010

Advisory Board Member, Evolutionary Computation Journal, MIT Press,
Since 2002

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

Editorial Board member, Swarm and Evolutionary Computation, Elsevier, Since 2010

Editorial Board Member, Journal of The Franklin Institute, Elsevier, Since 2010

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

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

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

Editorial Board Member, International Journal of Soft Computing and Bioinformatics, Scientific International Publisher, Since 2008

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

Editorial Board Member, Engineering Optimization Journal, Tailor and Francis, Since 2003

Editorial Board Member, Genetic Programming and Evolvable Machines, Springer, Since 2003

Editorial Board Member, Journal of Evolutionary Optimization, Polish Academy of Sciences, Since 1998

Editorial Board Member, Human Systems Management, IOS Press, Since 2006

Editorial Board Member, Journal of Memetic Computing, Springer, Since 2007

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)
31st 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

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. (**3,301** ISI Citations)
  2. **Deb, K.** (1995). *Optimization for engineering design: Algorithms and examples.* New Delhi: Prentice-Hall, (**Seventh Print**, 382 pages). (**393** ISI Citations)
- Recent edited books published:
  1. Wang, L., Ng, A. and **Deb, K.** (eds.) (2011). *Multi-Objective Evolutionary Optimisation for Product Design and Manufacturing.* London: Springer-Verlag.
  2. Branke, J., **Deb, K.**, Mietinnen, K. and Slowinski, R. (eds.) (2008). *Multiobjective optimization: Interactive andevolutionary approaches*, (Lecture Notes on Computer Science (LNCS 5252)), Berlin: Springer.
  3. Knowles, J, Corne, D. and **Deb, K.** (eds.) (2008). *Multiobjective Problem Solving from Nature: From Concepts to Applications*, (Natural Computing Series) Berlin: Springer.
- Book under progress:
  1. **Deb, K.** (in press, exp. 2012). *Innovization: Extracting innovative solution principles through multiobjective optimization.* Hidelberg, Germany: Springer.
- Published **116** international journal papers and **188** international conference papers (total **304** articles) till to date.
- Published **17** edited books and **27** book chapters/society magazine articles. Also written one Encyclopedia article on genetic algorithms.
- **ISI Web of Science Citation Count** of all publications (as on 31 December 2011): **17,189** (Seventeen thousand one hundred and eighty nine). Break-up is shown below:

	On 31 Dec'08	*On 31 Dec'09*	*On 27 Dec'10*	*On 31 Dec'11*
Books	1,925	2,503	3,019	3,694
Book Chapters	81	138	178	243
Journals	5,118	6,520	8,964	9.883
Conferences	1,397	1,716	2,047	2,582
Technical Reports	428	571	728	787
Total	**8,949**	**11,448**	**14,936**	**17,189**

- Folllowing statistics are found from Harzing's Publish or Perish website `http://www.harzing.com` (on 31 December 2011) with a total citation count of **38,810**, an increase of about 28% in the past year (30,245):

```
Authors Name: Deb K

Papers:    450   Cites/paper:    86.24  h-index:  69  AWCR:      3577.38
Citations: 38810  Cites/author: 19964.25  g-index: 194  AW-index:    59.81
Years:    25   Papers/author:  215.28  hc-index: 46  AWCRpA:    1791.33
Cites/year:1552.4 Authors/paper:    2.65  hI-index: 27   e-index:    171.46
```

- Hirsh Index is **69** on www.harzing.com (uses Google Scholar).
- Thomson Citation Laureate Award for having the highest ISI Web of Science citation counts in Computer Science category from India during 1996–2005
- Four (including highest and second-highest) of top 10 most cited papers in MIT Press's *Evolutionary Computation Journal* (http://www.mitpressjournals.org/action/showMostCitedArticles?journalCo

- Invited to deliver **35** keynote/plenary lectures in major international conferences in the past few years (See page 42).
- Presented **33** invited tutorials on 'Evolutionary multi-objective optimization' and **69** invited lectures on 'evolutionary algorithms', lists of which are appended at the end of this document.
- Associate Editor of following International Journals:
  1. IEEE Transactions on Evolutionary Computation published by IEEE Press
  2. Applied Soft Computing Journal by Elsevier
  3. Pacific Journal of Optimization by Yokohama Publishers
- Journal editorship: **18** International Journals
- Director of Kanpur Genetic Algorithms Laboratory (KanGAL):
  - 10 students (graduate, undergraduate students, and project staff) work under my supervision at any time
  - About 80 academic and industrial participants attend a three-day short course on Genetic Algorithms arranged every year
  - About 3 foreign PhD students visit KanGAL each averaging about 3 months every year
  - Nine freely downloadable softwares developed by KanGAL
- Major industrial projects: Volvo Car Coorporation, Sweden, General Motors (GM) USA and India Science Lab. Bangalore, General Electric (GE) USA and Bangalore, Honda R&D Japan, STMicroelectronics Italy, Orelogy, Australia. Other collaborations: Tata Steel Jamshedpur, Tata Engg. and Locomotive Company Pune, Hindustan Aeronautics Limited Bangalore etc.
- Funded Research Projects with foreign universities:
  - Alexander von Humboldt Foundation project on 'Real-parameter evolutionary optimization' with Hans-Paul Schwefel, University of Dortmund, Germany, 1998-1999
  - Asia-ITC funded MSc. Programme in Natural Computation at the computer science department with Xin Yao, University of Birmingham, UK (2001-02)
  - Alexander von Humboldt Foundation funded Bessel Reseach 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-Portugese 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-Portugese S&T Bilateral Govt. project with Gaspar Cunha, University Minho, 2010–2012
  - VINNOVA funded project on 'Simulattion 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

- Recipient of commendation certificates for excellence in teaching in various courses at IIT Kanpur from the Director of the institute.

Further details can be found in my web site `http://www.iitk.ac.in/kangal/deb.htm`.

Kalyanmoy Deb

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Indian Institute of Technology Kanpur, India
http://www.iitk.ac.in/kangal/deb.htm

Publication Record

The ISI Web of Science Citation Counts as on 31 December 2011 are marked in brackets. References with 10 or more citations are shown in bold. Total **ISI citation count is 17,189** (Harzing's publish or perish count: **38,810**).

Journal Papers:	116
Conference Papers:	188
Books:	2
Edited Books:	17

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. (**3,301** ISI Citations)

2. **Deb, K.** (1995). *Optimization for engineering design: Algorithms and examples.* New Delhi: Prentice-Hall, (**Seventh Print**, 382 pages). (**393** ISI Citations)

Papers in Journals (PUBLISHED)

1. **Deb, K.** and Saha, A. (2012). Multimodal Optimization Using a Bi-Objective Evolutionary Algorithms. *Evolutionary Computation Journal, 20*(1), 27–62.

2. Nandi, A. K., **Deb, K.**, Ganguly, S. and Datta, S. (2012). Investigating the role of metallic fillers in particulate reinforced flexible mould material composites using evolutionary algorithms. *Applied Soft Computing, 12*(1), 28–39.

3. **Deb, K.** and Gupta, S. (2011). Understanding Knee Points in Bicriteria Problems and Their Implications as Preferred Solution Principles. *Engineering Optimization, 43*(11). 1175–1204.

4. Bandaru, S. and **Deb, K.** (2011). Towards automating the discovery of certain innovative design principles through a clustering based optimization technique. *Engineering Optimization, 43*(9), 911–941.

5. Sindhya, K., **Deb, K.** and Miettinen, K. (2011). Improving Convergence of Evolutionary Multi-Objective Optimization with Local Search: A Concurrent-Hybrid Algorithm. *Natural Computation, 10.* 1407–1430.

6. Sharma, D., **Deb, K.** and Kishore, N. N. (2011). Domain-Specific Initial Population Strategy for Compliant Mechanisms Using Customized Genetic Algorithm. *Structural and Multidisciplinary Optimization, 43*(4). 541–554.

7. Padhye, N. and **Deb, K.** (2011). Multi-objective Optimisation and Multi-criteria Decision Making in SLS Using Evolutionary Approaches. *Rapid Prototyping Journal, 17*(6). 458–478.

8. Nicolini, M., Giacomello, C. and **Deb, K.** (2011). Calibration and optimal leakage management for a real water distribution network. *ASCE Journal of Water Resource Planning and Management, 137*(1). 134–142.

9. Tiwari, S., Fadel, G. and **Deb, K.** (2011). AMGA2: Improving the performance of the archive-based micro-genetic algorithm for multi-objective optimization. *Engineering Optimization, 43*(4). 377–401.

10. Nandi, A. K., **Deb, K.**, Datta, S., and Orkas, J. (2011). Studies on effective thermal conductivity of particle-reinforced polymeric flexible mould material composites. *Journal of Materials Design and Applications, 225*(L3), 149–159.

11. Cabello, J. M., Cejudo, J. M., Luque, M. M., Ruiz, R. **Deb, K.**, Tewari, R. (2011). Optimization of the size of a solar thermal electricity plant by means of genetic algorithms. *Renewable Energy, 36*(11). Elsevier, 3146–3153.

12. Nandi, A., Datta, S. and **Deb, K.** (2011). Investigating the Role of Non-metallic Fillers in Particulate-Reinforced Mould Composites using EAs. *Materials and Manufacturing Processes, 26*(3). Taylor and Francis. 541–549.

13. **Deb, K.**, Miettinen, K. and Chaudhuri, S. (2010). Towards an Estimation of Nadir Objective Vector Using a Hybrid of Evolutionary and Local Search Approaches. *IEEE Transacations on Evolutionary Computation*. IEEE Press. 821–841.

14. **Deb, K.** and Sinha, A. (2010). An Efficient and Accurate Solution Methodology for Bilevel Multi-Objective Programming Problems Using a Hybrid Evolutionary-Local-Search Algorithm. *Evolutionary Computation Journal, 18*(3). 403–449.

15. **Deb, K.**, Sinha, A., Korhonen, P., and Wallenius, J. (2010). An Interactive Evolutionary Multi-Objective Optimization Method Based on Progressively Approximated Value Functions. *IEEE Transactions on Evolutionary Computation, 14*(5). 723–739. (3)

16. **Deb, K.** and Köksalan, M. (2010). Guest Editorial: Special Issue on Preference-Based Multiobjective Evolutionary Algorithms. *IEEE Transcations on Evolutionary Computation, 14*(5), 669–670.

17. Chaudhuri, S. and **Deb, K.** (2010). An Interactive Evolutionary Multi-Objective Optimization and Decision Making Procedure. *Applied Soft Computing Journal, 10*, 496–511. (6)

18. **Deb, K.**, Gupta, S., Daum, D., Branke, J., Mall, A., and Padmanabhan, D. (2009). Reliability-Based Optimization Using Evolutionary Algorithms. *IEEE Transacations on Evolutionary Computation, 13*(5), 1054–1074. (**12**)

19. Kudikala, R., **Deb, K.**, and Bhattacharya, B. (2009). Multi-Objective Optimization of Piezoelectric Actuator Placement for Shape Control of Plates Using Genetic Algorithms. *ASME Journal of Mechanical Design, 131*(9), 091007-1–11.

20. Mittal, S. and **Deb, K.** (2009). Optimal strategies of the iterated prisoner's dilemma problem for multiple conflicting objectives. *IEEE Transactions on Evolutionary Computation, 13*(3), 554–565. (2)

21. Pettersson, F., Saxén, H. and **Deb, K.** (2009). Genetic algorthm based multicriteria optimization of ironmaking in the blast furnace. *Journal of Materials and Manufacturing Processes, 24*(3), 343–349. (**17**)

22. Branke, J., Scheckenbach, B. Stein, M., **Deb, K.** and Schmeck, H. (2009). Portfolio optimization with an envelope based evolutionary multi-objective optimization. *European Journal on Operations Research (EJOR), 199*(3), 684–693. (9)

23. **Deb, K.** (2008). Scope of stationary multi-objective evolutionary optimization: A case study on a hydro-thermal power dispatch problem. *Journal of Global Optimization, 41*(4), 479–515. (4)

24. Dyer, J. S., Fishburn, P. C., Steuer, R. E., Wallenius, J., Zionts, S. and **Deb, K.** (2008). Multiple criteria decision making, multiattribute utility theory: Recent accomplishments and what lies ahead. *Management Science, 54*(7), 1336–1349. (**37**)

25. Bandyopadhyay, S., Saha, S., Maulik, U. and **Deb, K.** (2008). A simulated annealing-based multiobjective optimization algorithm: AMOSA, *IEEE Transactions on Evolutionary Computation, 12*(3), 269–283. (**73**)

26. Bui, L. T., **Deb, K.**, Abbass, H. A. and Essam, D. (2008). Interleaving guidance in evolutionary multiobjective optimization. *Journal of Computer Science and Technology, 23*(1), 44–63. (3)

27. **Deb, K.** and Tiwari, S. (2008). Omni-optimizer: A generic evolutionary algorithm for global optimization. *European Journal of Operational Research (EJOR), 185*(3), 1062–1087. (**16**)

28. Datta, D., Fonseca, C. M. and **Deb, K.** (2008). A multi-objective evolutionary algorithm to exploit the similarities of resource allocation problems. *Journal of Scheduling, 11*(6), 405–419. (5)

29. **Deb, K.** (2007). Current Trends in Evolutionary Multi-objective Optimization. *International Journal for Simulation and Multidisciplinary Optimisation, 1*(1), 1–8. (8)

30. Datta, D. and **Deb, K.**, Fonseca, C. M., Lobo, F. G., Condado, P. A. and Seixas, J. (2007). Multi-objective evolutionary algorithm for land-use management problem, *International Journal of Computational Intelligence Research (IJCIR), 3*(4).

31. Shukla, P. and **Deb, K.** (2007). On Finding Multiple Pareto-Optimal Solutions Using Classical and Evolutionary Generating Methods. *European Journal of Operational Research (EJOR), 181*(3), 1630–1652. (**17**)

32. Sengupta, T. K., **Deb, K.**, Talla, S. B. (2007). Control of flow using genetic algorithm for a circular cylinder executing rotary oscillation. *Computers & Fluids, 36*(3), 578–600. (1)

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Technical Reports With Web of Science Citations

1. **Deb, K.**, Miettinen, K., and Chaudhuri, S. (2008). Estimating nadir objective vector: Hybrid of evolutionary and local search. *Working Paper W-440*, Helsinki School of Economics, Finland. (3)

2. **Deb, K.**, Sinha, A., (2008). Solving Bilevel Multi-Objective Optimization Problems Using Evolutionary Algorithms. *KanGAL Report No. 2008005*, Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (2)

3. **Deb, K.**, Sinha, A., (2008). Constructing Test Problems for Bilevel Evolutionary Multi-Objective Optimization. *KanGAL Report No. 2008010*, Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (1)

4. **Deb, K.** and Chaudhuri, S. (2007). I-MODE: An Interactive Multi-Objective Optimization and Decision-Making using Evolutionary Methods. *KanGAL Report No. 2007003*, Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (1)

5. Kukkonen, S. and **Deb, K.** (2007). A Fast and Effective Method of Pruning of Non-Dominated Solutions in Many Objective Problems. *KanGAL Report No. 2007004*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (1)

6. **Deb, K.**, Tewari, R., Dixit, M. and Dutta, J. (2007). Finding Trade-off Solutions Close to KKT Points Using Evolutionary Multi-Objective Optimization. *KanGAL Report No. 2007006*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (3)

7. **Deb, K.**, Sinha, A. and Kukkonen, S. (2006). Multi-Objective Test Problems, Linkages, and Evolutionary Methodologies. *KanGAL Report No. 2006001*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (2)

8. **Deb, K.**. (2006). Evolutionary Multi-Objective Optimization Without Additional Parameters. *KanGAL Report No. 2006003*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (2)

9. **Deb, K.**, Bhaskara Rao, U. and Karthik, S. (2006). Dynamic Multi-Objective Optimization and Decision-Making Using Modified NSGA-II: A Case Study on Hydro-Thermal Power Scheduling Bi-Objective Optimization Problems *KanGAL Report No. 2006008*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (3)

10. **Deb, K.** and Gupta, H. (2005). A constraint handling strategy for robust multi-criterion optimization. *KanGAL Report No. 2005001*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (4)

11. **Deb, K.** and Chaudhuri, S. (2005). I-EMO: An Interactive Evolutionary Multi-Objective Optimization Tool. *KanGAL Report No. 2005003*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (4)

12. **Deb, K.** and Srinivasan, A. (2005). Innovization: Innovation of design principles through optimization. *KanGAL Report No. 2005007*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (5)

13. **Deb, K.** and Saxena, D. (2005). On Finding Pareto-Optimal Solutions Through Dimensionality Reduction for Certain Large-Dimensional Multi-Objective Optimization Problems. *KanGAL Report No. 2005011*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (6)

14. **Deb, K.**, Mitra, K., Dewri, R. and Majumdar, S. (2004). Towards a Better Understanding of the Epoxy Polymerization Process Using Multi-Objective Evolutionary Computation. *KanGAL Report No. 2004001*, Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (1)

15. **Deb, K.** and Tiwari, S. (2004). Omni-Optimizer: A Procedure for Single and Multi-Objective Optimization. *KanGAL Report No. 2004013*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (3)

16. **Deb, K.** and Gupta, H. (2004). Introducing Robustness in Multi-Objective Optimization. *KanGAL Report No. 2004016*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (**14**)

17. **Deb, K.** and Reddy, A. R. (2003). Classification of Two-Class Cancer Data Reliably Using Evolutionary Algorithms. *KanGAL Report No. 2003001*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (3)

18. **Deb, K.**, Mohan, M. and Mishra, S. (2003). A Fast Multi-objective Evolutionary Algorithm for Finding Well-Spread Pareto-Optimal Solutions. *KanGAL Report No. 2003002*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (**72**)

19. **Deb, K.** (2003). A Population-Based Algorithm-Generator for Real-Parameter Optimization. *KanGAL Report No. 2003003*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (8)

20. **Deb, K.** and Reddy, A. R. (2003). Classification of Two and Multi-Class Cancer Data Reliably Using Multi-Objective Evolutionary Algorithms. *KanGAL Report No. 2003006*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (3)

21. **Deb, K.** and Jain, S. (2002). Multi-Speed Gearbox Design Using Multi-Objective Evolutionary Algorithms. *KanGAL Report No. 2002001*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (4)

22. **Deb, K.**, Reddy, A. R., and Singh, G (2002). Optimal Scheduling of Casting Sequence Using Genetic Algorithms. *KanGAL Report No. 2002002*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (1)

23. **Deb, K.**, Anand, A., and Joshi, D (2002). A Computationally Efficient Evolutionary Algorithm for Real-Parameter Optimization. *KanGAL Report No. 2002003*. Kanpur Genetic

Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (**18**)

24. **Deb, K.** and Jain, S. (2002). Running performance metrics for evolutionary multi-objective optimization. *KanGAL Report No. 2002004*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (**37**)

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28. **Deb, K.**, Thiele, L., Laumanns, M. and Zitzler, E. (2001). Scalable Test Problems for Evolutionary Multi-Objective Optimization. *TIK Report Nr. 112*, Computer Engineering and Networks Laboratory (TIK), Swiss Federal Institute of Technology (ETH) Zurich. (Also KanGAL Report Number 2001001). (**77**)

29. **Deb, K.** (2001). Genetic Algorithms for Optimization. *KanGAL Report Number 2001002*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (5)

30. **Deb, K.**, Joshi, D. and Anand, A. (2001). Real Coded Evolutionary Algorithms with Parent Centric Recombination. *KanGAL Report Number 2001003*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (6)

31. **Deb. K**, Pratap, A., Agarwal, S. and Meyarivan, T. (2000). A Fast and Elitist Multi-Objective Genetic Algorithm: NSGA-II. *KanGAL Report Number 200001*. Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (**211**)

32. **Deb, K.**, Pratap, A. and Moitra, S. (2000). Mechanical Component Design for multi-objective using Elitist non-dominated sorting GA. *KanGAL Report No. 200002*. Kanpur: Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (**24**)

33. **Deb, K.** and Goel, T. (2000). Multi-Objective Evolutionary Algorithms for Engineering Shape Design. *KanGAL Report No. 200003*. Kanpur: Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (8)

34. **Deb, K.** and Goel, T. (2000). Controlled Elitist Non-dominated Sorting Genetic Algorithms for Better Convergence. *KanGAL Report No. 200004*. Kanpur: Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (7)

35. **Deb, K.**, Pratap, A., and Meyarivan, T. (2000). Constrained Test Problems for Multi-Objective Evolutionary Optimization. *KanGAL Report No. 200005*. Kanpur: Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (5)

36. **Deb, K.** (1999). Multi-objective evolutionary algorithms: Introducing bias among Pareto-optimal solutions. *KanGAL Report No. 99002*. Kanpur: Kanpur Genetic Algorithms Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India. (**20**)

37. **Deb, K.** and Beyer, H.-G. (1999). Self-adaptive genetic algorithms with simulated binary crossover. *Technical Report Number CI-61/99*, LS11: University of Dortmund, Germany. (**10**)

38. **Deb, K**. (1999). Non-linear goal programming using multi-objective genetic algorithms. *Technical Report Number CI-60/99*, LS11: University of Dortmund, Germany. (**11**)

39. **Deb, K.** (1998). Multi-objective genetic algorithms: Problem difficulties and construction of test problems. *Technical Report No. CI-49/98*. Collaborative Research Centre 531, University of Dortmund, Germany. (**20**)

40. **Deb, K.** and Agrawal, R. B. (1994). Simulated Binary Crossover for Real-parameter Optimization. *SMD Paper Number 1994001*. Kanpur: Department of Mechanical Engineering, Indian Institute of Technology Kanpur. (6)

41. **Deb, K.**, Horn J., and Goldberg, D. E. (1992). Multimodal deceptive functions. *IlliGAL Report No. 92003*. Illinois Genetic Algorithms Laboratory, University of Illinois at Urbana-Champaign, USA. (3)

42. **Deb, K.** (1991). Binary and floating-point function optimization using messy genetic algorithms. *IlliGAL Report No. 91004*. Illinois Genetic Algorithms Laboratory, University of Illinois at Urbana-Champaign, USA. (**19**)

43. **Deb, K.** and Goldberg, D. E. (1991). mGAinC: A messy genetic algorithm in C. *IlliGAL Report No. 91008*. Illinois Genetic Algorithms Laboratory, University of Illinois at Urbana-Champaign, USA. (5)

44. **Deb, K.** and Goldberg, D. E. (1991) Analyzing deception in trap functions. *IlliGAL Report No. 91009*. Illinois Genetic Algorithms Laboratory, University of Illinois at Urbana-Champaign, USA. (**11**)

45. **Deb, K.** (1989). Multi-modal function optimization using genetic algorithms. *TCGA Report No. 89002*. The Clearinghouse of Genetic Algorithms, University of Alabama, Tuscaloosa, USA. (**42**)

Keynote/Plenary Lectures on Genetic and Evolutionary Algorithms

1. 26 April, 2000: **Keynote lecture** at the Advanced Computation in Design and Manufacturing Conference (ACDM-2000) in the University of Plymouth, UK entitled 'Multi-objective evolutionary optimization: Past, present, and future'.
2. 16 January, 2003: **Keynote lecture** on 'Evolutionary Algorithms for Single and Multiple Objective Optimization' during the Symposium on Evolutionary Algorithms at Doshisha University, Kyoto, Japan.
3. 17 September, 2003: **Plenary lecture** on 'Recent Advances on Evolutionary Multi-Objective Optimization' during EUROGEN-2003 conference in Barcelona, Spain.
4. 8 December, 2003: **Keynote lecture** during 'CEC-2003' conference entitled 'Multi-Objective Evolutionary Optimization' in Canberra, Australia.
5. 23 June, 2004: **Keynote lecture** during 'Hydroinformatics' Conference entitled 'Single and Multi-Objective Optimization Using Evolutionary Algorigthms' held in Singapore.
6. 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.
7. 12 December, 2005: **Keynote lecture** at GM Symposium entitled 'Practical Optimization Methods' held in Bangalore, India.
8. 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.
9. 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.
10. 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.
11. 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.
12. 12 February, 2007: **Keynote lecture** at the Water Resources Workshop at the University of Adelaide, Australia entitled 'Evolutionary optimization for engineering systems'.
13. 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'.
14. 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'.
15. 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'.

16. 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.

17. 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'.

18. 21 September, 2007: **Keynote lecture** at Symposium on Intelligence Computation and Applications (ISICA 2007) to be held in Wuhan, China.

19. 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'.

20. 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'.

21. 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'.

22. 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'.

23. 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'.

24. 12 February, 2009: **Keynote lecture** at the Sixth Spanish Conference on Metaheuristics entitled 'Evolutionary Multi-objective Optimization'.

25. 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'.

26. 4 June, 2009: **Keynote lecture** at Papermaking Research Symposium in Kuopio, Finland entitled 'Evolutionary Optimization in Practice'.

27. 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'.

28. 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'.

29. 24 October, 2010: Two **Invited lectures** at International Workshop on Nature Inspired Computation and Applications (IWNICA'10) in Hefei, China, entitled 'Evolutionary Multi-Objective Optimization'.

30. 29 October, 2010: **Invited lecture** at International Conference on Modeling Optimization and Computing, NIT Durgapur, India, entitled 'Evolutionary Multi-Objective optimization'.

31. 16 December, 2010: **Keynote lecture** at International conference on Swarm, Evolutionary and Memetic Computing (SEMCCO 2010) in Chennai, India, entitled 'Evolutionary Multi-Objective Optimization'.

32. 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'.

33. 20 August 2011: **Keynote Lecture** at the International Conferene on Industrial Applications of Soft-Computing Techniques (IIASCT-2011), Eastern Academy of Science and Technology, Bhubaneshwar, India, entitled 'Multi-Objective Optimization Using Evolutionary Algorithms'.

34. 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'.

35. 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'.

Invited Tutorials/Workshops on Multi-Objective Optimization (July'98 – Present)

1. 26 September 1998: Parallel Problem Solving from Nature-98, Amsterdam, The Netherlands

2. 6 April 1999: International Conference on Artificial Neural Networks and Genetic Algorithms (ICANNGA-99), Portoroz, Slovenia

3. 15 April 1999: ACDM/EvoDES Workshop, University of Bath, United Kingdom

4. 3 May 1999: French JET (Journees Evolutionaires Trimestrielles), University of Paris, France

5. 2 June 1999: EUROGEN Workshop, 'Evolutionary Algorithms for Multi-Criterion Optimization in Engineering Design', University of Jyväskylä, Finland

6. 13 July 1999: Workshop at Genetic and Evolutionary Computation Conference (GECCO), Omni Rosen Hotel, Orlando, USA

7. 14 July 1999: 'Messy Genetic Algorithms and Linkage Learning', Genetic and Evolutionary Computation Conference, Orlando, USA

8. 10 April 2001: An invited lecture at the Colliquium organized by the Biology-Inspired Computation Group, ETH, Zürich, Switzerland entitled 'An Introduction on Evolutionary Multi-Criterion Optimization'.

9. 27 May 2001: An invited tutorial given at the 'International Conference on Multi-Criterion Decision Making' held in Cairo, Egypt entitled 'An Introduction to Evolutionary Multi-Objective Optimization'.

10. 8 July 2001: An invited tutorial given at the GECCO-2001 Conference held in San Fransisco, USA in July 2001 entitled 'Multi-Criterion Optimization'.

11. 10 July 2002: Invited to present a tutorial during CEC-2002 Conference held in Honolulu, USA entitled 'Recent Trends in Evolutionary Multi-Criterion Optimization'.

12. 18 November, 2002: Invited to present a tutorial during SEAL-2002 Conference to be held in Singapore entitled 'Multi-Criterion Evolutionary Optimization'.

13. 17 August, 2003: Invited to present a tutorial during 'Multi-disciplinary International Scheduling Conference (MISTA)' under the theme 'Tutorials in Modern Optimization Methods' at the University of Nottingham, UK.

14. 26 June, 2004: Invited to deliver a tutorial on Evolutionary Multi-Objective Optimization during Genetic and Evolutionary Computation Conference (GECCO) 2004 conference held in Seattle, USA.

15. 8 November, 2004: A tutorial entitled 'Evolutionary Multi-objective Optimization' at Schloss Dagstuhl, Germany.

16. 7 February 2005: Workshop on 'Evolutionary Optimization Techniques' at GE's John F. Welch Technology Centre, Bangalore.

17. 10 January, 2006: Tutorial entitled 'An Introduction to Genetic Algorithms' held in Bengal Engineering and Science College, Kolkata, India.

18. 2-15 July, 2006: Tutorial entitled 'Evolutionary Methods to Multi-Criterion Optimization' at the 2006 MCDM Summer School held in Kainan University of Taiwan.

19. 9 July, 2006: Tutorial entitled 'Evolutionary Practical Optimization' at the 2006 Genetic and Evolutionary Computation Conference (GECCO-2006) held in Seattle, USA.

20. 16 July, 2006: Tutorial entitled 'Evolutionary Multi-Objective Optimization' at the World Congress on Computatinal Intelligence (WCCI-2006) held in Vancouver, Canada.

21. 18 July, 2006: Organizer of the Panel Discussion on 'Evolutionary Multi-Objective Optimization' held during WCCI Conference in Vancouver, Canada.

22. 7 July, 2007: Tutorial at GECCO-2007 in University College London entitled 'Evolutionary Practical Optimization'

23. 8 July, 2007: Tutorial at GECCO-2007 in University College London entitled 'Evolutionary Multi-Criterion Optimization' (along with Eckart Zitzler)

24. 20 September, 2007: Tutorial delivered at the Seventh International Conference on Evolvable Systems – From Biology to Hardware (ICES 2007) held in Wuhan, China entitled 'Evolutionary Multi-Objective Optimization (EMO)'.

25. 25 September, 2007: Tutorial delivered entitled 'Evolutionary Multi-Criterion Optimization (EMO): Fundamentals, State-of-the-art Methodologies and Future Challenges' during Congress on Evolutionary Computation (CEC-2007) in Singapore.

26. 12 July, 2008: Tutorial delivered at GECCO-2008 in Renaissance Atlanta Hotel, USA, entitled 'Evolutionary Multi-Criterion Optimization' (along with Eckart Zitzler).

27. 13 July, 2008: Tutorial delivered at GECCO-2008 in Renaissance Atlanta Hotel, USA, entitled 'Evolutionary Practical Optimization'.

28. 07 December, 2008: Tutorial delivered at SEAL-2008 Conference in Melbourne, Australia entitled 'Evolutionary Multi-Objective Optimization (EMO)'.

29. 18 May, 2009: Tutorial delivered at CEC-2009 Conference in Trondheim, Norway entitled 'Recent Challenges to Evolutionary Multi-Criterion Optimization (EMO)'.
30. 12 June, 2009: Tutorial delivered at ACM SIGEVO sponsored Genetic and Evolutionary Computation (GEC-Summit) in Shanghai, China entitled 'Evolutionary Multi-Objective Optimization: Current Approaches and Future Directions'.
31. 21 June, 2009: Tutorial at Multiple Criterion Decision Making (MCDM) Conference in Chengdu, China entitled 'Evolutionary Multi-Criterion Optimization and Its Applications'.
32. 14 September, 2009: CSIRO Multiobjective Optimisation Workshop entitled 'Introduction to Multi-Objective Optimization' and 'Introduction to NSGA-II' at CSIRO, New Castle, Australia.
33. 8 July, 2010: Tutorial delivered at GECCO-2010 Conference in Portland, USA entitled 'Evolutionary Multi-Criterion Optimization'.

Invited Talks on Genetic and Evolutionary Algorithms (Since Jan'98)

1. 12 January 1998: 'An Introduction to Genetic Algorithms', International Workshop on Soft Computing and Intelligent Systems, Indian Statistical Institute, Calcutta, India
2. 4 May 1998: 'An Introduction to Genetic Algorithms', National Remote Sensing Agency, Hyderabad, India
3. 15 July 1998: 'An Introduction to Genetic Algorithms', University of Braga, Portugal
4. 15 July 1998: 'Multi-Objective Optimization Using Genetic Algorithms', University of Braga, Portugal
5. 16 July 1998: 'Messy Genetic Algorithms: An Introduction', University of Braga, Portugal
6. 17 July 1998: 'An Introduction to Genetic Algorithms', University of Porto, Portugal
7. 20 July 1998: 'An Introduction to Multi-Objective Optimization Using Genetic Algorithms', University of Coimbra, Portugal
8. 26 October 1998: 'Real-parameter Genetic Algorithms Using Simulated Binary Crossover', University of Dortmund, Germany
9. 28 October 1998: 'An Overview of Genetic Algorithms', Swiss Federal Institute of Technology, ETH, Zürich, Switzerland
10. 12 November 1998: 'Genetic Algorithms in Engineering Design', University of Mainz, Germany
11. 20 November 1998: 'Real-Parameter Genetic Algorithms with Simulated Binary Crossover', Technical University of Berlin, Germany
12. 1 December 1998: 'Multi-Objective Genetic Algorithms with Non-Dominated Sorting', Centrum voor Wiskunde en Informatica (CWI), Amsterdam, The Netherlands
13. 17 March 1999: 'Real-parameter Genetic Algorithms for Engineering Design', GMD, St. Augustin, Bonn, Germany

14. 8 April 1999: 'Multi-Objective Genetic Algorithms', University of Ljubljana, Slovenia
15. 9 April 1999: 'Introduction to Genetic Algorithms and Multi-Objective Optimization', University of Trieste, Italy
16. 16 April 1999: 'Self-Adaptation in Real-Parameter Genetic Algorithms', Plymouth Engineering Design Centre, University of Plymouth, United Kingdom
17. 3 May 1999: 'An Overview of Multi-Objective Genetic Algorithms', University of Paris, France
18. 22 May 1999: 'Multi-Criterion Optimization Using Evolutionary Algorithms', University of Karlsruhe, Germany
19. 31 May 1999: 'Real-Parameter Genetic Algorithms in Engineering Design', EUROGEN-99, University of Jyväskylä, Finland
20. 9 July 1999: 'An Introduction to Multi-Objective Evolutionary Algorithms', Department of Computer Science, University of Missouri at St. Louis, USA
21. 12 July 1999: 'Multi-Objective Genetic Algorithms', Air Force Institute of Technology, Wright-Patterson Research Laboratory, Ohio, USA
22. 16 February 2000: 'Real-Coded Genetic Algorithms', Dagstuhl Seminar, at Schloss Dagstuhl, Saarbrücken, Germany.
23. 22 September 2000: 'An Introduction to Genetic Algorithms', ABB Heidelberg, Germany.
24. 9 December 2000: 'Non-dominated Sorting Genetic Algorithms for Multi-Objective Optimization', Tenth NASAS Conference, IIT Kanpur.
25. 6 July 2001: 'Evolutionary Multi-Objective Optimization' at National Institute for Standards and Technology (NIST), Gaithersburg, USA.
26. 14 January 2002: 'Test Problem Design for Multi-Objective Evolutionary Algorithms', Dagstuhl Seminar, at Schloss Dagstuhl, Saarbrücken, Germany.
27. 25 February 2002: Invited to present a lecture on 'An Introduction to Evolutionary Multi-Criterion Optimization' at Vikram Sarabhai Space Research Centre, Trivandram, India.
28. 17 June, 2002: 'An Introducton to Multi-objective Evolutionary Algorithms' at Univesity of Essex, UK.
29. 21 June, 2002: 'Real-Parameter Genetic Algorithms' at University of Birmingham, UK.
30. 24 June, 2002: 'An Introduction to Multi-Objective Evolutionary Algorithms' at the University of West of England, UK.
31. 21 November, 2002: 'Evolutionary Multi-Objective Optimization' delivered at National University of Singapore (NUS).
32. 4 December, 2002: 'Evolutionary Algorithms Pattern Recognition and Image Proceesing', CIMPA (International Center for Pure and Applied Mathematics, France) School on Soft computing approach to pattern recognition and image processing at Indian Statistical Institute, Kolkata, India.
33. 14 January, 2003: 'Evolutionary Multi-Objective Optimization' at Osaka Prefecture University, Japan.

34. 24 June, 2004: 'Advances on Evolutionary Multi-Objective Optimization' at Nang Yang Technological University (NTU) in Singapore.

35. 6 August, 2004: 'Single and Multi-Objective Evolutionary Optimization' at Simon Fraser University, Surrey Campus in Vancouver, Canada.

36. 17 May, 2005: 'Single and Multi-Objective Evolutionary Optimization for Engineering Problem Solving' at University of Pavia, Italy.

37. 18 May, 2005: 'Evolutionary Multi-Objective Optimization: A Decade of Research and Applications' at University of Pavia, Italy.

38. 27 July, 2005: 'Innovization: Innovative Designs Through Optimization' at University of Algarve, Portugal.

39. 5 September, 2005: 'Innovization: Innovating Design Principles Through Optimization' at University of Aalborg, Denmark.

40. 3 October, 2005: 'Optimization: A Indespensible Companion to Engineers and Scientists', N. Rama Rao Distinguished Lecture at CSE, IIT Kanpur.

41. 13 December, 2005: 'Multi-Objective Optimization Using Evolutionary Methods' at Post-SAROD Coference in IISc, Bangalore.

42. 9 January, 2006: 'Practical Methods of Optimization' at Tata Steel, Jamshedpur, India.

43. 7 February, 2006: 'Functional Decomposition of NSGA-II for Various Problem Solving Tasks', Schloss Dagstuhl, Germany.

44. 11 February, 2006: 'Hans-Paul, Predator-Prey and Multi-Objective Optimization', Colloquium at University of Dortmund, Germany.

45. 14 February, 2006: 'Practical Optimization Using Evolutionary Optimization', General Motors, Warren, USA.

46. 15 February, 2006: 'Discovering Important Design Principles Using Multi-Objective Optimization', Clemson University, USA.

47. 28 February, 2006: 'Evolutionary Optimization for Problem Solving and Knowledge Discovery', CNR Rao Distinguished Lecture, IIT Kanpur.

48. 24 May, 2006: 'Unveiling Innovative Design Principles Using Multi-Objective Optimization', Department of Electrical and Computer Engineering, National University of Singapore (NUS).

49. 8 June, 2006: 'Innovization: Innovating Design Principles Through Optimization', School of Electrical and Electronic Engineering, Nanyang Technological University (NTU), Singapore.

50. 4 August, 2006: Invited lecture entitled 'Evolutionary Practical Optimization' during Altair CAE User's Conference held in Bangalore.

51. 6 January, 2007: 'Non-linear Multi-Objective Optimization using Evolutionary Algorithms', IIT Kharagpur during ORSI Convention.

52. 8 February, 2007: 'Optimization Research at IIT Kanpur', during Indo-US Workshop on Computational Optimization and Analysis of Systems (COSA-2007)' at IIT Kanpur.

53. 06 July 2007: 'Innovization: Unveiling Design Principles Using Optimization' at the Department of Mechanical Enginerring, Helsinki University of Technology, Espoo, Finland.

54. 06 September 2007: 'Evolutionary Practical Optimization' at the Systems Analysis Laboratory, Helsinki University of Technology, Espoo, Finland.

55. 14 September 2007: 'Introduction to Evolutionary Optimization' at Department of Business Technology, Helsinki School of Economics.

56. 18 September 2007: 'Introduction to Evolutionary Optimization' at the Department of Mathematical Information Technology, University of Jyvskyl

57. 24 October 2007: 'Evolutionary Optimization for Practical Problem Solving' at Nokia, Espoo, Finland.

58. 8 November 2007: 'Evolutionary Optimization for Practical Problem Solving' at the Department of Physics, University of Kuopio

59. 22 November 2007: 'Evolutionary Optimization: Introduction and Applications' at the Department of Mechanical Engineerng, University of Turku

60. 05 December, 2007: 'Evolutionary Computing for Applied Single and Multi-Criterion Optimization' – an invited lecture at University of Skovde, Sweden

61. 31 January 2008: 'Evolutionary computation for applied single and multi-criterion optimization' at University of Nantes, France.

62. 10-12 February 2008: Short course on 'Evolutionary Computation' delivered for PhD students at University of Carlos III, Madrid, Spain.

63. 12 March 2008: 'Higher Education in India' at the Doctoral Studies Centre, Helsinki School of Economics, Finland.

64. 19 March 2008: 'Practical Optimization Using Evolutionary Methods' at KONE, Espoo, Finland.

65. 28 March 2008: 'Innovization: Innovation through Multi-Criterion Optimization' at the Department of Mathematical Information Technology, University of Jyvskyl

66. 4 April 2008: 'Evolutionary Practical Optimization' at the Ship Laboratory, Helsinki University of Technology, Espoo, Finland

67. 9-11 April 2008: Master's Course on 'Evolutionary Computation' delivered at University of Pavia, Italy.

68. 07 May 2008: 'Computational Optimization for Innovative Knowledge Discovery' at MASI Technology programme, Finnish Funding Agency for Technology and Innovation (TEKES), Finland

69. 22 May 2008: 'Knowledge Discovery Through Multi-Criterion Optimization', Invited Boat Seminar organized by Helsinki School of Economics

Invited talks after 22 May 2008 are not updated.