

# Ankur Sinha, Ph.D.

Department of Information and Service Economy  
Aalto University School of Business  
Former: Helsinki School of Economics  
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## EDUCATION

Aalto University School of Business, Helsinki, Finland  
Ph.D., Department of Business Technology, 2011

Indian Institute of Technology, Kanpur, India  
Bachelor of Technology, Department of Mechanical Engineering, 2006

## Ph.D. Dissertation

Topic: Progressively Interactive Evolutionary Multi-objective Optimization

Received dissertation of the year award (2011) at the Aalto University School of Business.

## PUBLICATIONS UNDER REVIEW

- [1] A. Sinha, P. Malo, and K. Deb. Solving bilevel multi-criterion optimization problems with lower level decision uncertainty.
- [2] A. Sinha, P. Malo, and K. Deb. Efficient evolutionary algorithm for single-objective bilevel optimization.

## PEER REVIEWED JOURNAL PUBLICATIONS

- [1] A. Sinha, P. Malo, and T. Kuosmanen. A multi-objective exploratory procedure for regression model selection. *Journal of Computational and Graphical Statistics*, 2014 (In Press).
- [2] A. Sinha, P. Malo, and K. Deb. Test problem construction for single-objective bilevel optimization. *Evolutionary Computation Journal*, 2014 (In Press).
- [3] P. Malo, A. Sinha, P. Takala, P. Korhonen, and J. Wallenius. Good debt or bad debt: Detecting semantic orientations in economic texts. *Journal of the American Society for Information Science and Technology*, 65(4):782–796, 2014.
- [4] A. Sinha, P. Malo, A. Frantsev, and K. Deb. Finding optimal strategies in a multi-period multi-leader-follower stackelberg game using an evolutionary algorithm. *Computers & Operations Research*, 41:374–385, 2014.
- [5] A. Sinha, K. Deb, P. Korhonen, and J. Wallenius. An interactive evolutionary multi-objective optimization algorithm with a limited number of decision maker calls. *European Journal of Operational Research*, 233(3):674–688, 2014.
- [6] Ankur Sinha, Dhish Kumar Saxena, Kalyanmoy Deb, and Ashutosh Tiwari. Using objective reduction and interactive procedure to handle many-objective optimization problems. *Applied Soft Computing*, 13(1):415 – 427, 2013.
- [7] P. Malo, P. Siitari, and A. Sinha. Automated query learning with wikipedia and genetic programming. *Artificial Intelligence*, 194:86–110, 2013.
- [8] P. Malo, A. Sinha, J. Wallenius, and P. Korhonen. Concept-based document classification using wikipedia and value function. *Journal of the American Society for Information Science and Technology*, 62(12):2496–2511, 2011.

- [9] K. Deb and A. Sinha. 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, 2010.
- [10] K. Deb, A. Sinha, P. Korhonen, and J. Wallenius. An interactive evolutionary multi-objective optimization method based on progressively approximated value functions. *IEEE Transactions on Evolutionary Computation*, 14(5):723–739, 2010.

## PEER REVIEWED CONFERENCE PUBLICATIONS

- [1] A. Sinha, P. Malo, and K. Deb. An improved bilevel evolutionary algorithm based on quadratic approximations. In *2014 IEEE Congress on Evolutionary Computation (CEC-2014)*. IEEE Press, 2014.
- [2] A. Sinha, P. Malo, P. Xu, and K. Deb. A bilevel optimization approach to automated parameter tuning. In *Proceedings of the 16th Annual Genetic and Evolutionary Computation Conference (GECCO 2014)*. New York: ACM Press, 2014.
- [3] P. Takala, P. Malo, A. Sinha, and O. Ahlgren. Gold-standard for topic-specific sentiments in economic texts. In *Language Resources and Evaluation Conference (LREC-2014)*, 2014.
- [4] A. Sinha, P. Malo, A. Frantsev, and K. Deb. Multi-objective stackelberg game between a regulating authority and a mining company: A case study in environmental economics. In *2013 IEEE Congress on Evolutionary Computation (CEC-2013)*. IEEE Press, 2013.
- [5] P. Malo, A. Sinha, P. Takala, O. Ahlgren, and I. Lappalainen. Learning the roles of directional expressions and domain concepts in financial news analysis. In *IEEE International Conference on Data Mining Workshops (SENTIRE-2013)*. IEEE Press, 2013.
- [6] A. Frantsev, A. Sinha, and P. Malo. Finding optimal strategies in multi-period stackelberg games using an evolutionary framework. In *IFAC Workshop on Control Applications of Optimization (IFAC-2009)*. Elsevier, 2012.
- [7] A. Sinha, P. Malo, and K. Deb. Unconstrained scalable test problems for single-objective bilevel optimization. In *2012 IEEE Congress on Evolutionary Computation (CEC-2012)*. IEEE Press, 2012.
- [8] A. Sinha, A. Pandey, and K. Deb. Solving high objective problems in fixed interactions with the decision maker. In *2012 IEEE Congress on Evolutionary Computation (CEC-2012)*. IEEE Press, 2012.
- [9] O. Ahlgren, P. Malo, A. Sinha, P. Korhonen, and J. Wallenius. A dimensionality reduction approach for semantic document classification. In *Proceedings of the Second Workshop on Semantic Personalized Information Management*, 2011.
- [10] A. Sinha, T. Kuosmanen, and P. Malo. Estimation of efficient regression model using a multi-objective procedure. In *Proceedings of the Annual International Conference on Operations Research and Statistics (ORS-2011)*, pages 72–77. Global Science and Technology Forum (GSTF), 2011.
- [11] A. Sinha. Bilevel multi-objective optimization problem solving using progressively interactive evolutionary algorithm. In *Proceedings of the Sixth International Conference on Evolutionary Multi-Criterion Optimization (EMO-2011)*, pages 269–284. Berlin, Germany: Springer-Verlag, 2011.
- [12] A. Sinha, K. Deb, P. Korhonen, and J. Wallenius. Progressively interactive evolutionary multi-objective optimization method using generalized polynomial value functions. In *2010 IEEE Congress on Evolutionary Computation (CEC-2010)*, pages 1–8. IEEE Press, 2010.
- [13] A. Sinha, P. Korhonen, J. Wallenius, and K. Deb. An interactive evolutionary multi-objective optimization method based on polyhedral cones. In *2010 Learning and Intelligent Optimization (LION-2010)*, pages 318–332. Berlin, Germany: Springer-Verlag, 2010.
- [14] K. Deb and A. Sinha. Solving bilevel multi-objective optimization problems using evolutionary algorithms. In *Evolutionary Multi-Criterion Optimization (EMO-2009)*, pages 110–124. Berlin, Germany: Springer-Verlag, 2009.

- [15] K. Deb and A. Sinha. Constructing test problems for bilevel evolutionary multi-objective optimization. In *2009 IEEE Congress on Evolutionary Computation (CEC-2009)*, pages 1153–1160. IEEE Press, 2009.
- [16] A. Sinha and K. Deb. Towards understanding evolutionary bilevel multi-objective optimization algorithm. In *IFAC Workshop on Control Applications of Optimization (IFAC-2009)*, volume 7. Elsevier, 2009.
- [17] K. Sindhya, A. Sinha, K. Deb, and K. Miettinen. Local search based evolutionary multi-objective optimization algorithm for constrained and unconstrained problems. In *2009 IEEE Congress on Evolutionary Computation (CEC-2009)*, pages 2919–2926. IEEE Press, 2009.
- [18] K. Deb and A. Sinha. An evolutionary approach for bilevel multi-objective problems. In *Cutting-Edge Research Topics on Multiple Criteria Decision Making, Communications in Computer and Information Science*, volume 35, pages 17–24. Berlin, Germany: Springer, 2009.
- [19] A. Sinha, S. Tiwari, and K. Deb. A population-based, steady-state procedure for real-parameter optimization. In *2005 IEEE Congress on Evolutionary Computation (CEC-2005)*, pages 514–521. IEEE Press, 2005.
- [20] A. Sinha, A. Srinivasan, and K. Deb. A population-based, parent centric procedure for constrained real-parameter optimization. In *2006 IEEE Congress on Evolutionary Computation (CEC-2006)*, pages 239–245. IEEE Press, 2006.
- [21] K. Deb, A. Sinha, and S. Kukkonen. Multi-objective test problems, linkages, and evolutionary methodologies. In *Proceedings of the 8th Annual Genetic and Evolutionary Computation Conference (GECCO 2006)*, pages 1141–1148. New York: ACM Press, 2006.

## BOOK CHAPTERS

- [1] A. Sinha and K. Deb. Bilevel multi-objective optimization and decision making. In E-G. Talbi and L. Brotcorne, editors, *Metaheuristics for bi-level optimization*. Springer, 2012.

## INVITED TALKS

- “Evolutionary approaches to handling bilevel optimization problems” at Beacon Center MSU, February 2013, East Lansing, MI, USA
- “Interactive Evolutionary Algorithm for Solving Many Criteria Optimization Problems” at INFORMS Annual Meeting, October 2012, Phoenix, AZ, USA
- “Optimization of large objective problems using interactive techniques” at 25th European Conference on Operational Research, July 2012, Vilnius, Lithuania
- “Solving Bilevel Problems Using an Evolutionary Approach” at INFORMS Annual Meeting, November 2011, Charlotte, NC, USA
- “Introduction to Bilevel Optimization” at Indian Institute of Technology Kanpur, August 2011, Kanpur, India
- “Progressively Interactive Evolutionary Multi-objective Optimization” at Saint Petersburg State University, May 2011, St. Petersburg, Russia
- “Solving Bilevel Multi-Objective Optimization Problems Using Evolutionary Algorithms” at University of Jyväskylä, November 2008, Jyväskylä, Finland

## WORK EXPERIENCE

**Aalto University School of Business, Helsinki, Finland**  
**Researcher**

**2008-To date**

- Job responsibilities include research activities and teaching courses on quantitative methods.
- The focus of research is in the area of decision making, optimization, big-data and financial text analysis.

**Michigan State University, East Lansing, Michigan****Visiting Scholar****2012-2013**

- Collaboration on many objective optimization problems and bilevel optimization problems.

**Tata Steel, Jamshedpur, India****Manager****2006-2007**

- Job responsibilities included process analysis, control and plant maintenance.
- Handled projects on Total Quality Management and Theory of Constraints with focus on Process Control, Six Sigma and Critical Chain Project Management.

**PROFESSIONAL SERVICE****Session Chair**

Session on Optimization and Decision-making: Theory and Applications at IFORS 2014 in Barcelona, Spain

Special session on Evolutionary Bilevel Optimization at CEC 2014 conference in Beijing, China.

Special session on Bilevel Optimization at CEC 2013 conference in Cancun, Mexico.

Special session on Bilevel Optimization at CEC 2012 conference in Brisbane, Australia.

Session on Applied Simulations at CEC 2009 conference in Trondheim, Norway.

**Tutorials**

Evolutionary Bilevel Optimization at PPSN (September 2014), Ljubljana, Slovenia.

Bilevel Optimization at GECCO (July 2013) in Amsterdam, Netherlands and GECCO (July 2014) in Vancouver, Canada.

**Reviewer**

Evolutionary Computation Journal

IEEE Transactions on Evolutionary Computation

Annals of Operations Research

European Journal of Operational Research

Journal of Multi-criteria Decision Analysis

Computers & Operations Research

Information Sciences

Journal of Computational and Applied Mathematics

Journal of Heuristics

Pacific Journal on Optimization

Technometrics

International Journal of Information Technology and Decision Making

**Program or Advisory Committee Member**

Congress on Evolutionary Computation (CEC), 2009, 2010, 2011, 2012, 2013, 2014

Evolutionary Multi-Criterion Optimization (EMO) Conference, 2011, 2013

Genetic and Evolutionary Computation Conference (GECCO), 2010, 2011, 2012, 2013, 2014

Simulated Evolution and Learning (SEAL) Conference, 2010

## TEACHING

### Course Instructor

Tools for Business Decisions 30C00400 (Masters/Bachelors Level)	Spring 2012, 2013, 2014
Quantitative Business Analysis 30A00410 (Bachelors Level)	Fall 2011, 2012, 2013
Optimization 30E00100 (PhD Level)	Fall 2013

## SCHOLASTIC ACHIEVEMENTS

- Received the best PhD thesis award at the Aalto University School of Business for the year 2011.
- Recipient of a prestigious grant from the Finland graduate school on Systems Analysis, Decision Making and Risk Management in 2009.
- Awarded the Best Project Award while working at Innovative Design Engineering Animation in 2008.
- Awarded the Outstanding B. Tech. project award for the year 2005-06 in the Department of Mechanical Engineering, IIT Kanpur for the Design and Development of Heat Pipe Based Radiator for Satellites.
- As an active member of the Programming Club, IIT Kanpur supervised and handled a number of successful projects.
- Awarded the Little Flower School Centenary Gold Medal in the year 2001 for excellent performance in academics.

## PROFESSIONAL AFFILIATIONS

Member of the Association for Computing Machinery (ACM)  
Member of the Institute of Electrical and Electronics Engineers (IEEE)  
Member of the IEEE Computational Intelligence Society  
Member of the Institute for Operations Research and the Management Sciences (INFORMS)  
Member of the Multi-Criteria Decision Making Society

## PERSONAL INFORMATION

- Date of Birth: 19th July, 1983
- Sex: Male
- Languages: English and Hindi
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