Gül Gürkan

Department of Econometrics and Operations Research
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Employment

Associate Professor (with tenure), September 2001 – present, Department of Econometrics and Operations Research, Tilburg School of Economics and Management, Tilburg University

Assistant Professor, September 1996 – August 2001, Department of Econometrics and Operations Research, Tilburg School of Economics and Management, Tilburg University

Research interests

Quantitative methods to support decision under uncertainty; stochastic optimization problems and equilibrium models, simulation, stochastic modeling techniques, mathematical programming; applications in energy, environment, transportation, revenue management, service networks, and call centers.

Education

Ph. D. Industrial and Systems Engineering, University of Wisconsin-Madison, August 1996.
Major: Operations Research, *Minor:* Mathematics
Thesis: Performance Optimization in Simulation: Sample-path Optimization of Buffer Allocations in a Tandem Queue
Advisor: Stephen M. Robinson
M. Sc. Computer Sciences, University of Wisconsin-Madison, May 1995.
B. Sc. Industrial Engineering, Boğaziçi University, Istanbul, Turkey, July 1991,
B. Sc. Mathematics, Boğaziçi University, Istanbul, Turkey, July 1991.

Grants

Principal investigator of a (Vernieuwingsimpuls – VIDI) project titled "Decision Making Under Uncertainty: Solving Stochastic Optimization and Equilibrium Models via Simulation". The project was financed by the Dutch National Science Foundation (NWO – Nederlandse Organisatie voor Wetenschappelijk Onderzoek) and the budget was approximately 750,000 euro spread over six years (March 2001 – March 2007).

Acted as senior scientific advisor for Tolga Çezik in securing a Marie-Curie International Incoming Fellowship for a project titled "Semidefinite and Robust Optimization and Their Economic Applications". The project was financed by European Commission under the 6th Framework Programme on Research, Technological Development and Demonstration and the budget was approximately 150,000 euro spread over two years (February 2005 – February 2007).

Research and teaching experience

Visiting Scholar

Stanford University, Department of Management Science and Engineering
(April 2008 – August 2008, November 2008 – January 2009, April 2009 – August 2009, November 2009 – December 2010)

University of Auckland, Department of Engineering Science (November 2006 – December 2006)

Stanford University, Department of Engineering Economic Systems and Operations Research (November 1999 – January 2000)

Columbia University, Department of Industrial Engineering and Operations Research, and IBM, T. J. Watson Research Center (August 1998 – December 1998)

Research Assistant (University of Wisconsin-Madison)

With Stephen M. Robinson (June 1993 – August 1996)
With Sigrún Andradóttir (September 1991 – May 1993)

Teaching

Tilburg University:
Improving Society Lab (BSc Econometrics and Operations Research)
Analytics for Business and Governance (MSc Data Science: Business and Governance)
Mathematics 1 for ECO (BSc International Economics)
Statistics for ECO (BSc International Economics)
Statistics and Data Management 1 (BSc International Business Administration)
Introduction to Probability and Analysis (BSc Econometrics and Operations Research)
Differentiation and Integration Theory (BSc Econometrics and Operations Research)
Stochastic Optimization, Stochastic Models (MSc/Bsc Econometrics and Operations Research)
Introduction to Operations Research/Management Science (BSc Econometrics and Operations Research)
Statistics 1 (BSc International Economics and Finance, BSc International Business, and BSc Business Studies)
Applied Methods (MSc Economics and Finance of Ageing)
Selected Topics in Advance OR (MPhil/PhD in Operations Research)
Various MSc and BSc theses

University of Wisconsin-Madison:
Queueing Theory and Stochastic Modeling (graduate)
Nonlinear Programming Algorithms (graduate)
Linear Programming Methods (graduate/undergraduate)
Operations Research–Stochastic Modeling (undergraduate)
Operations Research–Deterministic Modeling (undergraduate)

Ph. D. Thesis Supervision (Tilburg University)

Ph. D. student advising

Romeo Langestraat, 2013, joined Experian, The Hague, as solutions analyst.
"Environmental Policies in Competitive Electricity Markets".

Özge Özdemir, 2013, joined Policy Studies Group of EnergyResearch Centre of the Netherlands (ECN), Amsterdam as scientific researcher.
"Simulation-based Optimization under Uncertainty: Applications in Stochastic Fluid Models and Strategic Gaming Analysis for Electricity Markets".

Ebru Angün, 2004, joined Galatasaray University, Istanbul, Turkey as assistant professor.
"Black Box Simulation Optimization: Generalized Response Surface Methodology" (co-advisor with Dick den Hertog and Jack Kleijnen).

Ph. D. committee member

Steffan Berridge, 2004, joined Man Investments, London, UK, as quantitative analyst.
"Irregular Grid methods for Pricing High-Dimensional American Options" (advisor Hans Schumacher).

Publications (in refereed journals and books)

Gürkan, G. and Langestraat, R. 2014. Modeling and analysis of renewable energy obligations and technology bandings in the UK electricity market. *Energy Policy* 70: 85-95.

Gürkan, G. and Pang, J-S. 2009. Approximations of Nash equilibria. *Mathematical Programming* 117(1-2): 223–253.

Angün, E., Kleijnen, J., den Hertog, D., and Gürkan, G. 2009. Response surface methodology with stochastic constraints for expensive simulation. *Journal of the Operational Research Society* 60 (6): 735-746.

Gürkan, G., Karaesmen, F., and Özdemir, Ö. 2007. Optimal threshold levels in stochastic fluid models via simulation-based optimization. *Discrete Event Dynamic Systems* 17: 53-97.

Birbil, Ş. İ., Gürkan, G., and Listeş, O. 2006. Solving stochastic mathematical programs with complementarity constraints using simulation. *Mathematics of Operations Research* 31(4): 739–760.

Gürkan, G. and Özge, A. Y. 2002. Functional properties of throughput in tandem lines with unreliable servers and finite buffers. Accepted for publication in *Journal of Optimization Theory and Applications*.

Gürkan, G. 2000. Simulation optimization of buffer allocations in production lines with unreliable machines. *Annals of Operations Research* 93: 177–216.

Fu, M. C., Wu, R., Gürkan, G., and Demir, A. Y. 2000. A note on perturbation analysis estimators for American-style options. *Probability in Engineering and Informational Sciences* 14: 385–392.

Gürkan, G., Özge, A. Y., and Robinson, S. M. 1999. Sample-path solution of stochastic variational inequalities. *Mathematical Programming* 84: 313–333.

Gürkan, G., Özge, A. Y., and Robinson, S. M. 1998. Sample-path solutions for simulation optimization problems and stochastic variational inequalities. In: *Interfaces in Computer Science and Operations Research*, ed. D. L. Woodruff (Kluwer, Boston), 169–188.

Pritchard, G., Gürkan, G., and Özge, A. Y. 1995. A note on locally Lipschitzian functions. *Mathematical Programming* 71(3): 369–370.

Mollamustafaoğlu, L., Gürkan, G., and Özge, A. Y. 1993. Object-oriented design of output analysis tools for simulation languages. *Simulation* 60(1): 6–16.

PUBLICATIONS (in refereed proceedings)

Birbil, Ş. İ., Gürkan, G., and Listeş, O. 2004. Solving stochastic mathematical programs with complementarity constraints using simulation. In: *Proceedings of the 2004 Winter Simulation Conference*, eds. R. G. Ingalls, M. D. Rossetti, J. S. Smith, B. A. Peters, (IEEE, Piscataway, New Jersey), 550–558.

Angün, E., Gürkan, G., den Hertog, D., and Kleijnen, J. P. C. 2002. Response surface methodology revisited. In: *Proceedings of the 2002 Winter Simulation Conference*, eds. E. Yücesan, C. -H. Chen, J. L. Snowdon, and J. M. Charnes (IEEE, Piscataway, New Jersey), 377–383.

Gürkan, G., Özge, A. Y., and Robinson, S. M. 1999. Solving stochastic optimization problems with stochastic constraints: An application in network design. In: *Proceedings of the 1999 Winter Simulation Conference*, eds. P. A. Farrington, H. B. Nembhard, D. T. Sturrock, and G. W. Evans, (IEEE, Piscataway, New Jersey), 471–478.

Gürkan, G. and Karaesmen, F. 1999. Computation of optimal flow control policies of a manufacturing system with multiple production rates. In: *Proceedings of Second International Aegean Conference on Analysis and Modeling of Manufacturing Systems*, ed. C. Papadopoulos, 171–176.

Gürkan, G., Özge, A. Y., and Robinson, S. M. 1996. Sample-path solution of stochastic variational inequalities, with applications to option pricing. In: *Proceedings of the 1996 Winter Simulation Conference*, eds. J. M. Charnes, D. M. Morrice, D. T. Brunner, and J. J. Swain (IEEE, Piscataway, New Jersey), 337–344.

Gürkan, G. and Özge, A. Y. 1996. Optimal buffer allocations in a tandem production line. In: *Proceedings of 1996 Manufacturing and Service Operations Management Conference*, ed. M. R. Singh, 225–230.

Gürkan, G., Özge, A. Y., and Robinson, S. M. 1994. Sample-path optimization in simulation. In: *Proceedings of the 1994 Winter Simulation Conference*, eds. J. D. Tew, S. Manivannan, D. A. Sadowski and A. F. Seila (IEEE, Piscataway, New Jersey), 247–254.

Andradóttir, S. and Gürkan, G. 1992. An empirical comparison of stochastic approximation methods for simulation optimization. In: *Proceedings of the First Industrial Engineering Research Conference*, eds. G.-A. Klutke, D. A. Mitta, B. O. Nnaji, and L. M. Seiford (Institute of Industrial Engineers, Norcross, GA), 471–475.

Preprints and work in progress

Langestraat, R. and Gürkan, G. 2014. Prices versus Quantities: Can Renewable Energy Quota be Achieved under Fixed Feed-in Tariff Policies? Preprint, submitted for publication.

Gürkan, G., Langestraat, R., and Özdemir, O. 2014. Implications of CO2 Regulation Schemes on Incentives for Investment in Electricity Generation Technologies. Preprint, submitted for publication.

Gürkan, G., Özdemir, O., and Smeers, Y. 2013. Generation Capacity Investments in Electricity Markets: Perfect Competition. CentER Discussion Paper, vol. 2013-045, Tilburg University, Tilburg, The Netherlands.

Gürkan, G., Özdemir, O., and Smeers, Y. 2013. Strategic Generation Capacity Choice under Demand Uncertainty: Analysis of Nash Equilibria in Electricity Markets. CentER Discussion Paper, vol. 2013-044, Tilburg University, Tilburg, The Netherlands.

Gürkan, G., Langestraat, R., and Özdemir, O. 2013. Introducing CO2 Allowances, Higher Prices For All Consumers; Higher Revenues For Whom? CentER Discussion Paper, vol. 2013-015, Tilburg University, Tilburg, The Netherlands.

Refereeing

Annals of Operations Research, *Applied Mathematics and Optimization*, *Journal of Optimization Theory and Applications*, *Operations Research*, *Management Science*, *Mathematical Methods of Operations Research*, *Mathematical Programming*, *Mathematics of Operations Research*, *SIAM Journal on Optimization*, *Stochastic Models*, *IEEE Transactions on Automatic Control*, *IEEE Transactions on Robotics and Automation*, Dutch National Science Foundation (NWO), and National Science Foundation (NSF) of USA.

Administrative service

Tilburg University, Tilburg School of Economics and Management

Staff member of the Educational Committees for *i*) MSc programmes in Business Analytics and Operations Research, Marketing Analytics, and Information Management and *ii*) BSc programmes in International Bachelors, September 2017 – present.

Coordinator of MPhil and PhD programmes of Operations Research track within CentER's Graduate School (responsible for graduate admissions, financial aid, curriculum, morale, and review of early progress), June 2006 – December 2009.

Part of a team which did cost-benefit analysis and developed a plan for a Bachelor's program offered completely in English, January 2007 – June 2007.

References

Professor Dick den Hertog
Faculty of Economics and Business, University of Amsterdam
e-mail: D.denHertog@uva.nl

Professor Peter Glynn
Department of Management Science and Engineering, Stanford University
fax: +1 (650) 725-1614 e-mail: glynn@stanford.edu

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Department of Industrial Engineering, Koç University (Istanbul, Turkey)
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Professor Stephen M. Robinson
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Professor Yves Smeers
Center for Operations Research and Econometrics (CORE), Catholic University of Louvain
phone: +32 (10) 474323 e-mail: yves.smeers@uclouvain.be