

**PERSONAL DATA**

**Full Name** Klas Åke *Michael* Patriksson  
**Citizenship** Swedish  
**Date of Birth** 21 December, 1964  
**Family status** Married, two children

**CURRENT OFFICE ADDRESS**

**Office** Department of Mathematical Sciences  
Chalmers University of Technology  
SE-412 96 Gothenburg, Sweden  
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**EDUCATION**

**2004–** Professor of applied mathematics (professor), Department of Mathematics, Chalmers University of Technology, Gothenburg

**2004–08** Postgraduate examiner in applied mathematics, Department of Mathematics, Göteborg University, Gothenburg

**2004** Studies in history, Göteborg University, Gothenburg

**2002–03** Examiner in applied mathematics, Department of Mathematics, Göteborg University, Gothenburg

**2002–04** Professor of applied mathematics (biträdande professor), Department of Mathematics, Chalmers University of Technology, Gothenburg

**2001–04** Studies in history, military history, and sociology, Lund University, Lund, and Kristianstad College, Kristianstad

**1997** Docent (habilitation) in optimization, Department of Mathematics, Linköping University, Linköping, Sweden

**1991–1993** Doctor of Philosophy, Division of Optimization, Department of Mathematics, Linköping University, Linköping  
Title of Doctorate Thesis: *A Unified Framework of Descent Algorithms for Nonlinear Programs and Variational Inequalities*  
Thesis advisor: Associate Professor Torbjörn Larsson  
Faculty opponent: Professor R. Tyrrell Rockafellar, University of Washington, Seattle, WA, USA

**1988–1991** Licentiate of Philosophy, Division of Optimization, Department of Mathematics, Linköping University, Linköping  
Title of Licentiate Thesis: *Algorithms for Urban Traffic Network Equilibria*  
Thesis advisor: Associate Professor Torbjörn Larsson  
Faculty opponent: Dr. Karl-Johan Rehn, Royal Institute of Technology, Stockholm, Sweden

**1984–1988** Bachelor of Science in Mathematics, Linköping University, Linköping

## EXPERIENCE

<b>2009–2011</b>	Guest professor, Department of mathematics, Linköping University, Linköping
<b>2007–09</b>	Guest researcher, Department of Electrical Engineering, Royal Institute of Technology, Stockholm
<b>2004–</b>	Professor of applied mathematics, Department of Mathematics, Chalmers University of Technology, Gothenburg (parental leave 20–25% during 2007–2008 and 2011)
<b>2002–04</b>	Professor of applied mathematics (biträdande professor), Department of Mathematics, Chalmers University of Technology, Gothenburg
<b>2001–2008</b>	Scientific advisor, Fraunhofer-Chalmers Center for Industrial Mathematics, Gothenburg
<b>1997–2002</b>	Associate professor, Department of Mathematics, Chalmers University of Technology, Gothenburg
<b>1995–1997</b>	Temporary position as lecturer/assistant professor (vikarierande universitetslektor), Division of Optimization, Department of Mathematics, Linköping University, Linköping
<b>1994–1995</b>	Postdoctoral scholarship, Department of Mathematics, University of Washington, Seattle, WA, USA
<b>1993–1994</b>	Postdoctoral scholarship, Department of Mathematics, University of York, Heslington, England
<b>1988–1993</b>	Ph.D. student (doktorand), Division of Optimization, Department of Mathematics, Linköping University, Linköping
<b>Spring 1988</b>	Research assistant (amanuens), Division of Optimization, Department of Mathematics, Linköping University, Linköping

## PROFESSIONAL SOCIETIES

- EURO (The Association of European Operational Research Societies) Member, 1991–; Founding member of EURO Working Group on Transportation
- INFORMS (Institute for Operations Research and the Management Sciences) Member, 1995–; Member of ORSA and TIMS, 1988–1994
- MOS (Mathematical Optimization Society, formerly Mathematical Programming Society) Member, 1988–
- SIAM (Society of Industrial and Applied Mathematics), Member, 1993–
- SORA/SOAF (Swedish Operations Research Society), Vice President, 1992–1993; Board Member, 1991–1993; Member, 1989–1993
- SULF (Swedish University Teacher’s Union), Chairman of the PhD student section, 1989–1990

## AWARDS

- The semi-annual Scandinavian First Maintenance Service Award for 2010, awarded at the Maintenance Fair in Gothenburg, Sweden, March 10, 2010 (with A.-B. Strömberg, Chalmers)
- The Frisinger Stipend for 2004, awarded 30 March 2005, by the Håkan Frisinger Foundation for Transport Research. The prize is a tax free scholarship of 250,000 SEK
- Svensson–Svenfeldt’s Scholarship for study merits, Katedralskolan, Linköping, 1981–1983

## EDITORSHIPS

- Editor for EURO Journal on Transportation and Logistics, 2011–

- Associate editor for *Journal of Optimization Theory and Applications*, 2010–
- Member of the Editorial Advisory Board for *Transportation Research, Series B*, 1999–
- Associate editor for *Transportation Science*, 2001–

### REFEREING AND REVIEWING

Reviewer on one book; reviewer on about 50 papers for *Mathematical Reviews*, and referee on about 240 papers for proceedings volumes and about 50 journals in applied mathematics.

### ADMINISTRATION

- Vice president of the board of SOAF (Svenska Operationsanalysföreningen), 2012–; deputy member 2011–12
- The Ph.D. student position committee in mathematics at Chalmers, 2009–10
- Responsible for the selection of new coffee machines for the lunch room at Mathematical Sciences, as well as the contract negotiations, 2010
- The team preparing the initiative seminar at Chalmers on mathematical modeling, 2009–10
- The faculty research funding group at mathematics, Chalmers and Gothenburg University, 2008–11
- The research council, The Northern Lead logistics research centre, Chalmers University of Technology and Gothenburg University, 2008–
- The team leader group at mathematics, Chalmers and Gothenburg University, 2008–
- The board of mathematics, Mathematical Sciences, Chalmers and Gothenburg University, 2007–10
- Deputy leader of the strategic research centre GMMC (Gothenburg Mathematical Modeling Centre), 2006–
- The book committee at mathematics, Chalmers and Gothenburg University, 1997–
- An informal team leader group at mathematics, Chalmers and Gothenburg University, 2005–07
- Chairman of the library board at mathematics, Chalmers and Gothenburg University, 2001–07
- Deputy member of the board of mathematical sciences, Chalmers University of Technology and Göteborg University, 2001–07
- Chairman of a strategic research committee at mathematics, Chalmers and Gothenburg University, 2005
- Chairman of a committee for the reorganization of the mathematics library, Chalmers and Gothenburg University, 2004–05
- The program committee in Technical Mathematics at Chalmers, 1997–2005
- An informal team leader group at mathematics, Chalmers and Gothenburg University, 2000–2001
- The strategic committee for future research in mathematics at Chalmers and Gothenburg University, 1999–2000
- Program committees for mathematics in economics studies at Chalmers and Gothenburg University, 1999–2000
- The Ph.D. position committee in industrial and applied mathematics at Chalmers, 1997–98

### CONFERENCE ORGANIZATION

- Member of the local organizing committee for the initiative seminar on scientific models, Chalmers University of Technology, September 15–16, 2010
- Member of the international scientific committee for the 7th TRISTAN conference, Tromsø, Norway, June 21–25, 2010

- Co-organizer of the workshop “Optimization of Maintenance Activities—Models, Methods and Applications”, December 10–11, 2009
- Co-organizer of the invited workshop “Radiobiologically based optimization for IMRT”, Hotel Novotel, Gothenburg, Sweden, September 13, 2008
- Chairman of the organizing committee for the workshop “Robust Multiobjective Design Optimization With Simulation”, FCC, Gothenburg, Sweden, December 3–4, 2007
- Member of the international scientific committee for the 6th TRISTAN conference, Bentota, Sri Lanka, June 10–15, 2007
- Member of the international scientific committee for the 5th TRISTAN conference, Le Gosier, Guadeloupe, French West Indies, June 13–18, 2004
- Member of the local organizing committee for the International Symposium on Mathematical Programming, ISMP 2003, Copenhagen, August 2003
- Member of the international scientific committee for the International Symposium on Transport Network Reliability, Kyoto University, Kyoto, 31 July, 2001
- Member of the scientific committee for the 4th TRISTAN conference, São Miguel, The Azores, Portugal, June 13–19, 2001
- Member of the international program committee for the 8th Meeting of the EURO Working Group on Transportation, Rome, September 11–14, 2000
- Member of the international program committee for “Modeling and Management in Transportation”, Poznan and Cracow, Poland, October 12–16, 1999
- Organizer of the 6th Meeting of the EURO Working Group on Transportation, Chalmers, September 9–11, 1998
- Member of the organizing committee for “Traffic Network Models: A Symposium in the Honour of Sven Erlander”, Vadstena, June 16–20, 1996
- Organizer of Invited Session, the EURO XIII/OR 36 Conference, Glasgow, July 19–22, 1994

#### **THESIS REFEREE**

- Chairman of the external committee, Doctoral thesis by Björn Johansson, Telecommunication, School of Electrical Engineering, Royal Institute of Technology, Stockholm, 2009
- Member of the external committee, Doctoral thesis by Andreas Fhager, Biomedical Engineering, Signals and Systems, Chalmers University of Technology, 2006
- Member of the external committee, Doctoral thesis by Wolfgang Ernst, University of Western Australia, Australia, 2003
- Member of the external committee, Doctoral thesis by Ricardo García, Universidad de Castilla-La Mancha, Spain, 2001
- Member of the external committee, Doctoral thesis by Bijun Han, Traffic planning division, Royal Institute of Technology, Stockholm, 2001
- Member of the external committee, Doctoral thesis by Jörgen Blomvall, Division of Optimization, Department of Mathematics, Linköping University, Linköping, 2001
- Member of the external committee, Doctoral thesis by Daniel Hilding, Division of Mechanics, Department of Mechanical Engineering, Linköping University, Linköping, 2000
- Member of the external committee, Doctoral thesis by Johan Marklund, Division of Production Management, Lund Institute of Technology, 1999
- External referee, Doctoral thesis by Patricia Daniele, Dipartimento di Matematica, Università di Catania, Italy, 1999
- Faculty opponent, Licentiate thesis by Daniel Hilding, Division of Mechanics, Department of Mechanical Engineering, Linköping University, Linköping, 1998
- Faculty opponent, Licentiate thesis by Torgil Abrahamsson, Department of Optimization and Systems Theory, Royal Institute of Technology, Stockholm, 1992

#### **EXTERNAL ADVISE**

- External reviewer of four project proposals for the Research Grant Council, Hong Kong, 2012
- External reviewer of a tenure track application, the Civil and Environmental Engineering Department, Northwestern University, Evanston, IL, USA, 2012
- External reviewer of a project proposal for the Israel Science Foundation, Israel, 2010
- External reviewer of two project proposals in the National Priorities Research Program (NPRP) for the Qatar National Research Fund, Qatar, 2010
- External reviewer of two project proposals for the Research Grant Council, Hong Kong, 2009
- External reviewer of an application for a docent promotion, School of Computing, Blekinge Institute of Technology, Karlskrona, 2009
- External reviewer of an application for a full professorship promotion, Department of Mathematics, Stockholm University, Stockholm, 2008
- External reviewer of project proposals in mathematics for The Royal Swedish Academy of Sciences, 2004
- External reviewer of project proposals on optimization for VR (Vetenskapsrådet, The Swedish Research Council), 2003
- Member of the board of advisors (beredningsgruppen) of VR Vetenskapsrådet, The Swedish Research Council), mathematics and technical mathematics, responsible for optimization, 2001
- External expert in British government traffic research program DIADEM (Development of integrated assignment and demand modelling) (partner: Mott McDonald, Ltd.), 2000–2002
- External reviewer of project proposals on optimization for the Swedish Natural Science Research Council (NFR), 2000
- Engineering and Physical Sciences Research Council (EPSRC, UK government funding agency), projects on traffic networks, 1998–1999
- EU project *Generalised Equilibrium Modelling* (Partners: MVA Systematica, University of York, Centre for Transport Studies), 1997–1998

#### **INTERNAL ADVISE**

- Mentor for a researcher in mathematical statistics, Chalmers University of Technology, 2009–

#### **RESEARCH INTERESTS**

Mathematical programming, Algorithm theory for continuous optimization problems, Numerical algorithms for large-scale structured optimization problems, Nondifferentiable optimization, Stochastic bilevel optimization and stochastic mathematical programs with equilibrium constraints, Stochastic programming, Modelling and solution of traffic equilibrium problems and associated design and control problems, Theory and algorithms for variational inequality problems, Networks, Parallel algorithms for continuous problems over Cartesian product sets, Structural optimization, Lagrangian theory and heuristics for integer programming problems, Mixed integer programming applications—especially maintenance optimization and production planning

#### **TEACHING INTERESTS**

Mathematical programming, Operations research, Linear programming, Nonlinear programming, Convex programming, Integer programming, Combinatorial optimization, Parallel optimization, Decomposition/coordination methods, Networks, Traffic models

#### **ERDÖS NUMBER**

My Erdős number is 4, which is reached in at least seven ways

#### **PUBLICATIONS**

### A. Books and Monographs

[4] N. ANDRÉASSON, A. EVGRAFOV, AND M. PATRIKSSON, *Introduction to Continuous Optimization*, Studentlitteratur, Lund, Sweden, 2005. Licensed 2006 to Overseas Press India for international sales in Asia and South Africa. Under revision for possible publication with Springer-Verlag.

[3] M. LABBÉ AND M. PATRIKSSON (EDS.), *Transportation Planning—State of the Art*, Applied Optimization Series, vol. 64, Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002.

[2] M. PATRIKSSON, *Nonlinear Programming and Variational Inequality Problems—A Unified Approach*, Applied Optimization Series, vol. 23, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1998. [Reviewed by I. Konnov in *Mathematical Reviews*, no. 9 (1999).]

[1] M. PATRIKSSON, *The Traffic Assignment Problem—Models and Methods*, Topics in Transportation Series, VSP, Utrecht, The Netherlands, 1994. [Reviewed by L. Wynter in *Transportation Science*, vol. 30, no. 3 (1996), pp. 271–272.]

### B. Chapters in Books

[7] P. MARCOTTE AND M. PATRIKSSON, *Traffic Equilibrium*, in *Transportation*, volume 14 in the series *Handbooks in Operations Research and Management Science*, C. Barnhart and G. Laporte (eds.), North-Holland, Amsterdam, 2007, pp. 623–713.

[6] M. JOSEFSSON AND M. PATRIKSSON, *On the applicability of sensitivity analysis formulas for traffic equilibrium models*, in *Mathematical and Computational Methods for Congestion Charging*, Proceedings of the Theory and Practice of Congestion Charging Symposium, Imperial College, London, August 18–20, 2003, D. Hearn, S. Lawphongpanich, and M. Smith (eds.), vol. 148 in the Applied Optimization series, Springer-Verlag, Berlin, 2005, pp. 117–141.

[5] M. PATRIKSSON, *BETA—Mathematics handbook for science and engineering*, Fifth edition, by L. Råde and B. Westergren, Sections 15.2–15.4, Springer-Verlag, Berlin; Studentlitteratur, Lund, 2003.

[4] M. PATRIKSSON, *Cost approximation algorithms*, in *Encyclopedia of Optimization*, P. A. Floudas and P. M. Pardalos (eds.), Kluwer Academic Publishers, New York, NY, 2002, vol. I (A–D), pp. 350–361. Reprinted in the second edition, Springer-Verlag, NY, 2008.

[3] M. PATRIKSSON, *Simplicial decomposition algorithms*, in *Encyclopedia of Optimization*, P. A. Floudas and P. M. Pardalos (eds.), Kluwer Academic Publishers, New York, NY, 2002, vol. V (R–Z), pp. 205–212. Reprinted in the second edition, Springer-Verlag, NY, 2008.

[2] T. LARSSON AND M. PATRIKSSON, *Side constrained traffic equilibrium models—Traffic management through link tolls*, in *Equilibrium and Advanced Transportation Modelling*, P. Marcotte and S. Nguyen (eds.), Kluwer Academic Publishers, Boston, MA, 1998, pp. 125–151.

[1] M. PATRIKSSON, *Parallel cost approximation algorithms for differentiable optimization*, in *Parallel Computing in Optimization*, A. Migdalas, P. Pardalos, and S. Storøy (eds.), Kluwer Academic Publishers, New York, NY, 1997, pp. 295–341.

### C. Edited Special Issues of Refereed Journals

[2] M. PATRIKSSON AND A.-B. STRÖMBERG (EDS.), *Optimization of Maintenance Activities*, *Annals of Operations Research*, to be edited.

[1] M. PATRIKSSON (ED.), *Robust Multiobjective Design Optimization With Simulation*, *Optimization & Engineering*, vol. 11, no. 4, December 2010.

### D. Articles in Refereed Journals

[57] M. PATRIKSSON, A.-B. STRÖMBERG, AND A. WOJCIECHOWSKI, *The stochastic opportunistic replacement problem, part II: A two-stage solution approach*, *Annals of Operations Research*, to appear.

[56] M. PATRIKSSON, A.-B. STRÖMBERG, AND A. WOJCIECHOWSKI, *The stochastic opportunistic replacement problem, part I: Models incorporating individual component lives*, *Annals of Operations Research*, to appear.

[55] M. PATRIKSSON, A.-B. STRÖMBERG, AND T. LARSSON, *Ergodic convergence in sub-gradient optimization—with application to simplicial decomposition of convex programs*, *Contemporary Mathematics*, to appear.

[54] E. SVENSSON, A.-B. STRÖMBERG, AND M. PATRIKSSON, *A model for optimization of*

*process integration investments under uncertainty*, *Energy*, vol. 36, no. 5 (2011), pp. 2733–2746.

[53] M. PATRIKSSON AND K. THÖRNBLAD, *A note on the complexity of flow-shop scheduling with deteriorating jobs*, *Discrete Applied Mathematics*, vol. 159, no. 4 (2011), pp. 251–253.

[52] A. MARÍN, R. GARCÍA, AND M. PATRIKSSON, *Column generation algorithms for nonlinear optimization, II: Numerical investigations*, *Computers & Operations Research*, vol. 38, no. 3 (2011), pp. 591–604.

[51] S. JAKOBSSON, M. SAIF-UL-HASNAIN, R. RUNDQVIST, F. EDELVIK, B. ANDERSSON, M. PATRIKSSON, M. LJUNGQVIST, D. LORTET, AND K. WALLESTEN, *Combustion engine optimization: A multiobjective approach*, *Optimization & Engineering*, vol. 11, no. 4 (2010), pp. 533–554.

[50] S. JAKOBSSON, M. PATRIKSSON, J. RUDHOLM, AND A. WOJCIECHOWSKI, *A method for simulation based optimization using radial basis functions*, *Optimization & Engineering*, vol. 11, no. 4 (2010), pp. 501–532.

[49] M. PATRIKSSON, *Editorial*, *Optimization & Engineering*, vol. 11, no. 4 (2010), pp. 497–499.

[48] P. LINDROTH, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Approximating the Pareto optimal set using a reduced set of objective functions*, *European Journal of Operational Research*, vol. 207, no. 3 (2010), pp. 1519–1534.

[47] M. DANEVA, T. LARSSON, M. PATRIKSSON, AND C. RYDERGREN, *A comparison of feasible direction methods for the stochastic transportation problem*, *Computational Optimization and Applications*, vol. 46, no. 3 (2010), pp. 451–466.

[46] C. CROMVIK AND M. PATRIKSSON, *On the robustness of global optima and stationary solutions to stochastic mathematical programs with equilibrium constraints, part II: Applications*, *Journal of Optimization Theory and Applications*, vol. 144, no. 3 (2010), pp. 479–500.

[45] C. CROMVIK AND M. PATRIKSSON, *On the robustness of global optima and stationary solutions to stochastic mathematical programs with equilibrium constraints, part I: Theory*, *Journal of Optimization Theory and Applications*, vol. 144, no. 3 (2010), pp. 461–478.

[44] E. SVENSSON, T. BERNTSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *An optimization methodology for identifying robust process integration investments under uncertainty*, *Energy Policy*, vol. 37, no. 2 (2009), pp. 680–685.

[43] M. PATRIKSSON, *On the applicability and solution of bilevel optimization models in transportation science: A study on the existence, stability and computation of optimal solutions to stochastic mathematical programs with equilibrium constraints*, *Transportation Research, Part B*, vol. 42, no. 10 (2008), pp. 843–860.

[42] M. PATRIKSSON, *Robust bilevel optimization models in transportation science*, *Philosophical Transactions of the Royal Society, A: Mathematical, Physical & Engineering Sciences*, vol. 366, no. 1872 (2008), pp. 1989–2004.

[41] TORBJÖRN LARSSON, JOHAN MARKLUND, CAROLINE OLSSON, AND MICHAEL PATRIKSSON, *Convergent Lagrangian heuristics for nonlinear minimum cost network flows*, *European Journal of Operational Research*, vol. 189, no. 2 (2008), pp. 324–346.

[40] M. PATRIKSSON, *A survey on the continuous nonlinear resource allocation problem*, *European Journal of Operational Research*, vol. 185, no. 1 (2008), pp. 1–46.

[39] M. JOSEFSSON AND M. PATRIKSSON, *Sensitivity analysis of separable traffic equilibria, with application to bilevel optimization in network design*, *Transportation Research, Part B*, vol. 41, no. 1 (2007), pp. 4–31.

[38] T. LARSSON AND M. PATRIKSSON, *Global optimality conditions for discrete and nonconvex optimization—With applications to Lagrangian heuristics and column generation*, *Operations Research*, vol. 54, no. 3 (2006), pp. 436–453.

[37] A. EVGRAFOV AND M. PATRIKSSON, *On the convergence of stationary sequences in topology optimization*, *International Journal of Numerical Methods in Engineering*, vol. 64, no. 1 (2005), pp. 17–44.

[36] M. PATRIKSSON, *Sensitivity analysis of traffic equilibria*, *Transportation Science*, vol. 38, no. 3 (2004), pp. 258–281.

[35] M. PATRIKSSON, *Algorithms for computing traffic equilibria*, *Networks & Spatial Economics*, vol. 4, no. 1 (2004), pp. 23–38.

[34] A. EVGRAFOV AND M. PATRIKSSON, *On the existence of solutions to stochastic mathematical programs with equilibrium constraints*, *Journal of Optimization Theory and Applications*,

vol. 121, no. 1 (2004), pp. 65–76.

[33] T. LARSSON, M. PATRIKSSON, AND C. RYDERGREN, *A column generation procedure for the side constrained traffic equilibrium problem*, *Transportation Research, Part B*, vol. 38, no. 1 (2004), pp. 17–38.

[32] T. LARSSON, M. PATRIKSSON, AND C. RYDERGREN, *Inverse nonlinear multicommodity flow optimization by column generation*, *Optimization Methods and Software*, vol. 18, no. 5 (2003), pp. 601–613.

[31] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *On the convergence of conditional  $\varepsilon$ -subgradient methods for convex programs and convex-concave saddle-point problems*, *European Journal of Operational Research*, vol. 151, no. 3 (2003), pp. 461–473.

[30] A. EVGRAFOV AND M. PATRIKSSON, *Stable relaxations of stochastic stress constrained weight minimization problems*, *Structural and Multidisciplinary Optimization*, vol. 25, no. 3 (2003), pp. 189–198.

[29] A. EVGRAFOV AND M. PATRIKSSON, *Stochastic structural topology optimization: Discretization and penalty function approach*, *Structural and Multidisciplinary Optimization*, vol. 25, no. 3 (2003), pp. 174–188.

[28] A. EVGRAFOV, M. PATRIKSSON, AND J. PETERSSON, *Stochastic structural topology optimization: Existence of solutions and sensitivity analyses*, *ZAMM (Zeitschrift für Angewandte Mathematik und Mechanik)*, vol. 83, no. 7 (2003), pp. 479–492.

[27] R. GARCÍA, A. MARÍN, AND M. PATRIKSSON, *A class of column generation/simplicial decomposition methods in convex differentiable optimization, I: Convergence analysis*, *Optimization*, vol. 52, no. 2 (2003), pp. 171–200.

[26] M. PATRIKSSON AND R.T. ROCKAFELLAR, *Sensitivity analysis of variational inequalities over aggregated polyhedra, with application to traffic equilibria*, *Transportation Science*, vol. 37, no. 1 (2003), pp. 56–68.

[25] M. PATRIKSSON AND R.T. ROCKAFELLAR, *A bilevel optimization model and descent algorithm for traffic management*, *Transportation Science*, vol. 36, no. 3 (2002), pp. 271–291.

[24] M. PATRIKSSON AND J. PETERSSON, *Existence and continuity of optimal solutions to some structural topology optimization problems including unilateral constraints and stochastic loads*, *ZAMM (Zeitschrift für Angewandte Mathematik und Mechanik)*, vol. 82, no. 7 (2002), pp. 435–459.

[23] S. CHRISTIANSEN, M. PATRIKSSON, AND L. WYNTER, *Stochastic bilevel programming in structural optimization*, *Structural and Multidisciplinary Optimization*, vol. 21, no. 5 (2001), pp. 361–371.

[22] M. PATRIKSSON AND L. WYNTER, *Stochastic mathematical programs with equilibrium constraints*, *Operations Research Letters*, vol. 25, no. 4 (1999), pp. 159–167.

[21] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Ergodic, primal convergence in dual subgradient schemes for convex programming*, *Mathematical Programming*, vol. 86, no. 2 (1999), pp. 283–312.

[20] T. LARSSON AND M. PATRIKSSON, *Side constrained traffic equilibrium models: analysis, computation and applications*, *Transportation Research, Part B*, vol. 33, no. 4 (1999), pp. 233–264.

[19] M. PATRIKSSON, *Cost approximation algorithms with nonmonotone line searches for nonlinear programs*, *Optimization*, vol. 44, no. 3 (1998), pp. 199–217.

[18] J.T. LUNDGREN AND M. PATRIKSSON, *The combined distribution and stochastic assignment problem*. *Annals of Operations Research*, vol. 82 (1998), pp. 309–329.

[17] M. PATRIKSSON, *Cost approximation: A unified framework of descent algorithms for nonlinear programs*, *SIAM Journal on Optimization*, vol. 8, no. 2 (1998), pp. 561–582.

[16] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Ergodic convergence in subgradient optimization*. *Optimization Methods and Software*, vol. 9, nos. 1 & 3 (1998), pp. 93–120.

[15] M. PATRIKSSON, *Decomposition methods for differentiable optimization problems on Cartesian product sets*, *Computational Optimization and Applications*, vol. 9, no. 1 (1998), pp. 5–42.

[14] T. LARSSON, Z.-W. LIU, AND M. PATRIKSSON, *A dual scheme for traffic assignment problems*, *Optimization*, vol. 42, no. 4 (1997), pp. 323–358.

[13] T. LARSSON AND M. PATRIKSSON, *Traffic management through link tolls—An ap-*



*proach utilizing side constrained traffic equilibrium models*, Rendiconti del Circolo Matematico di Palermo, Serie II, vol. 48 (1997), pp. 147–170.

[12] M. PATRIKSSON, *Merit functions and descent algorithms for a class of variational inequality problems*, Optimization, vol. 41, no. 1 (1997), pp. 37–55.

[11] J. PETERSSON AND M. PATRIKSSON, *Topology optimization of sheets in contact by a subgradient method*, International Journal of Numerical Methods in Engineering, vol. 40, no. 7 (1997), pp. 1295–1321.

[10] O. DAMBERG, J.T. LUNDGREN, AND M. PATRIKSSON, *An algorithm for the stochastic user equilibrium problem*, Transportation Research, Part B, vol. 30, no. 2 (1996), pp. 115–131.

[9] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Conditional subgradient optimization—theory and applications*, European Journal of Operational Research, vol. 88, no. 2 (1996), pp. 382–403.

[8] T. LARSSON AND M. PATRIKSSON, *An augmented Lagrangean dual algorithm for link capacity side constrained traffic assignment problems*, Transportation Research, Part B, vol. 29, no. 6 (1995), pp. 433–455.

[7] T. LARSSON AND M. PATRIKSSON, *Equilibrium characterizations of solutions to side constrained asymmetric traffic assignment models*, Le Matematiche, vol. 49, no. 2 (1994), pp. 249–280.

[6] M. PATRIKSSON, *On the convergence of descent methods for monotone variational inequalities*, Operations Research Letters, vol. 16, no. 5 (1994), pp. 265–269.

[5] T. LARSSON AND M. PATRIKSSON, *A class of gap functions for variational inequalities*, Mathematical Programming, vol. 64, Series A, no. 1 (1994), pp. 53–79.

[4] T. LARSSON, A. MIGDALAS, AND M. PATRIKSSON, *A partial linearization algorithm for the traffic assignment problem*, Optimization, vol. 28, no. 1 (1993), pp. 47–61.

[3] M. PATRIKSSON, *A unified description of iterative algorithms for traffic equilibria*, European Journal of Operational Research, vol. 71, no. 2 (1993), pp. 154–176.

[2] M. PATRIKSSON, *Partial linearization methods in nonlinear programming*, Journal of Optimization Theory and Applications, vol. 78, no. 2 (1993), pp. 227–246.

[1] T. LARSSON AND M. PATRIKSSON, *Simplicial decomposition with disaggregated representation for the traffic assignment problem*, Transportation Science, vol. 26, no. 1 (1992), pp. 4–17.

### E. Articles in Refereed Conference Proceedings

[27] K. THÖRNBLAD, M. PATRIKSSON, A.-B. STRÖMBERG, AND T. ALMGREN, *Mathematical modelling of a real flexible job shop in aero engine component manufacturing*, In: *Proceedings of the 10th Workshop on Models and Algorithms for Planning and Scheduling Problems, June 2011, Nymburk, Czech Republic*.

[26] F. BESNARD, M. PATRIKSSON, A. STRÖMBERG, A. WOJCIECHOWSKI, K. FISCHER AND L. BERTLING, *A stochastic model for opportunistic maintenance planning of offshore wind farms*, In: *Proceedings of 2011 IEEE Trondheim PowerTech Conference, Trondheim, Norway, June 19–23, 2011*, pp. 1–8.

[25] J. NILSSON, A. WOJCIECHOWSKI, A.-B. STRÖMBERG, M. PATRIKSSON, AND L. BERTLING, *An evaluation approach for opportunistic maintenance optimization models for nuclear power plants*, In: *Proceedings of IEEE PES General Meeting, PES 2010, Minneapolis, MN, July 25–29, 2010*.

[24] J. NILSSON, M. PATRIKSSON, A.-B. STRÖMBERG, A. WOJCIECHOWSKI, AND L. BERTLING, *An opportunistic maintenance optimization model for shaft seals in feed-water pump systems in nuclear power plants*, In: *Proceedings of 2009 IEEE Bucharest PowerTech Conference, 2009*, pp. 2962–2969.

[23] F. BESNARD, M. PATRIKSSON, A.-B. STRÖMBERG, A. WOJCIECHOWSKI, AND L. BERTLING, *An optimization framework for opportunistic maintenance of offshore wind power systems*, In: *Proceedings of 2009 IEEE Bucharest PowerTech Conference, 2009*, pp. 2970–2976.

[22] T. LARSSON, J. LUNDGREN, M. PATRIKSSON, AND C. RYDERGREN, *Numerical experiments with a decision support system methodology for strategic traffic management*, In: *Urban and Regional Transportation Modeling: Essays in Honor of David Boyce, D.-H. Lee (ed.)*, Edward Elgar, Northampton, MA, 2004, pp. 337–364.

[21] M. PATRIKSSON AND R.T. ROCKAFELLAR, *Variational geometry and equilibrium*,

In: *Equilibrium Problems and Variational Models*, Proceedings of the International School of Mathematics “G. Stampacchia” 32th Workshop, held June 23–July 2, 2000, in Erice, Italy, P. Daniele, F. Giannessi, and A. Maugeri (eds.), Kluwer Academic Publishers, 2003, Dordrecht, The Netherlands, pp. 347–368.

[20] A. EVGRAFOV, M. PATRIKSSON, AND J. PETERSSON, *On stochastic structural topology optimization*, In: *Nonsmooth/Nonconvex Mechanics: With Applications in Engineering*, Proceedings of the International Conference in memory of Professor P. D. Panagiotopoulos, 5–6 July 2002, Thessaloniki, Greece, C. C. Baniotopoulos (ed.), Editions ZITI, Thessaloniki, Greece, pp. 97–104.

[19] T. LARSSON, J. LUNDGREN, M. PATRIKSSON, AND C. RYDERGREN, *A decision support methodology for strategic traffic management*, In: *Transportation and Network Analysis: Current Trends*, M. Gendreau and P. Marcotte (eds.), Kluwer Academic Publishers, 2002, Dordrecht, The Netherlands, pp. 147–164.

[18] M. PATRIKSSON AND R.T. ROCKAFELLAR, *Sensitivity analysis of traffic equilibria revisited*, In: *Preprints of TRISTAN IV*, São Miguel, The Azores, Portugal, June 13–19, 2001, vol. 1/3, pp. 189–194.

[17] R. GARCÍA, A. MARÍN, AND M. PATRIKSSON, *Network equilibrium models: A class of column generation/simplicial decomposition algorithms*, In: *Preprints of TRISTAN IV*, São Miguel, The Azores, Portugal, June 13–19, 2001, vol. 1/3, pp. 119–124.

[16] T. LARSSON, J. LUNDGREN, M. PATRIKSSON, AND C. RYDERGREN, *A decision support methodology for strategic traffic management*, In: *Preprints of TRISTAN IV*, São Miguel, The Azores, Portugal, June 13–19, 2001, vol. 1/3, pp. 75–79.

[15] T. LARSSON AND M. PATRIKSSON, *Modèles d’équilibre du trafic en présence de contraintes—gestion du trafic au maoyen des péages*, French translation of the article [2] below, made by M. J. Mingotaud, INRETS, in *Modélisation du Trafic*, Actes de groupe de travail 1997, Les Collections de l’INRETS, Actes 74, M. Aron, F. Boillot, and J.-P. Lebaque (eds.), Institut National de Recherche sur les transports et leur sécurité (INRETS), Arcueil, France, 2001, pp. 95–126.

[14] T. LARSSON, P.-O. LINDBERG, J. LUNDGREN, M. PATRIKSSON, AND C. RYDERGREN, *On traffic equilibrium models with a nonlinear time/money relation*, In: *Transportation Planning: State of the Art*, Proceedings of the 6th Meeting of the EURO Working Group on Transportation, 9–11 September 1998, Gothenburg, Sweden, M. Patriksson and M. Labbé (eds.), Kluwer Academic Publishers, 2002, pp. 19–31.

[13] T. LARSSON, J. LUNDGREN, M. PATRIKSSON, AND C. RYDERGREN, *Most likely traffic equilibrium route flows: Analysis and computation*, In: *Equilibrium Problems: Nonsmooth Optimization and Variational Inequality Models*, Proceedings of an international Workshop in Memory of Marino De Luca, Hotel Villa Diodoro, Taormina, Italy, December 3–5, 1998, F. Giannessi, A. Maugeri, and P. M. Pardalos (eds.), Kluwer Academic Publishers, 2001, pp. 129–159.

[12] T. LARSSON, J. LUNDGREN, M. PATRIKSSON, AND C. RYDERGREN, *Outline to a decision support tool for traffic management*, In: *Urban Transport Systems*, Proceedings of the 2nd KFB Research Conference, Lund Institute of Technology, June 7–8, 1999.

[11] M. PATRIKSSON, *A new merit function and an SQP method for non-strictly monotone variational inequalities*, In: *Nonlinear Optimization and Related Topics*, Proceedings of the International School of Mathematics “G. Stampacchia” 28th Course on Nonlinear Optimization and Applications, held June 23–July 2, 1998, in Erice, Italy, G. Di Pillo and F. Giannessi (eds.), Kluwer Academic Publishers, New York, NY, 2000, pp. 257–276.

[10] T. LARSSON AND M. PATRIKSSON, *Price-directive traffic management—Applications of side constrained traffic equilibrium models*, In: *Transportation Networks: Recent Methodological Advances*, Selected Proceedings of the 4th EURO Transportation Meeting, Newcastle University, Newcastle, UK, September 9–11, 1996, M. G. H. Bell (ed.), Pergamon Press, Amsterdam, 1998, pp. 83–97.

[9] J.T. LUNDGREN AND M. PATRIKSSON, *An algorithm for the combined distribution and assignment model*, In: *Transportation Networks: Recent Methodological Advances*, Selected Proceedings of the 4th EURO Transportation Meeting, Newcastle University, Newcastle, UK, September 9–11, 1996, M. G. H. Bell (ed.), Pergamon Press, Amsterdam, 1998, pp. 239–253.

[8] T. LARSSON, M. PATRIKSSON, AND C. RYDERGREN, *Applications of simplicial decom-*

*position with nonlinear column generation to nonlinear network flows*, In: *Network Optimization*, Proceedings of the Network Optimization Conference, University of Florida, Gainesville, FL, February 12–14, 1996, P. Pardalos, W.W. Hager, and D.W. Hearn (eds.), Lecture Notes in Economics and Mathematical Systems, vol. 450, Springer-Verlag, 1997, pp. 346–373.

[7] M. PATRIKSSON AND J. PETERSSON, *A subgradient method for contact structural optimization*, In: *Complementarity and Variational Problems—State of the Art*, Proceedings of the International Conference on Complementarity Problems (ICCP-95) held at The Johns Hopkins University, Baltimore, Maryland, November 1995, Proceedings in Applied Mathematics, vol. 92, M.C. Ferris and J.-S. Pang (eds.), SIAM, Philadelphia, PA, 1997, pp. 295–314.

[6] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Ergodic results in subgradient optimization*, In: *Nonlinear Optimization and Applications*, Proceedings of the International School of Mathematics “G. Stampacchia” 21st Workshop on Nonlinear Optimization and Applications, held June 13–21, 1995, in Erice, Italy, G. Di Pillo and F. Giannessi (eds.), Plenum Press, New York, NY, 1996, pp. 229–248.

[5] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Ergodic results and bounds on the optimal value in subgradient optimization*, In: *Operations Research Proceedings 1995*, Selected Papers of the Symposium on Operations Research (SOR ’95), Passau, September 13–15, 1995, P. Kleinschmidt, A. Bachem, U. Derigs, D. Fischer, U. Leopold-Wildburger, and R. Möhring (eds.), Springer-Verlag, Berlin, 1996, pp. 30–35.

[4] T. LARSSON AND M. PATRIKSSON, *Equilibrium characterizations of solutions to side constrained asymmetric traffic assignment models*, In: *Proceedings of the 3rd Meeting of the EURO Working Group on Transportation*, Universitat Politècnica de Catalunya, Barcelona, Spain, September 27–29, 1995, J. Barcelo (ed.), Institut Català d’Estudis del Transport, 1995, pp. 143–164.

[3] T. LARSSON AND M. PATRIKSSON, *On side constrained models of traffic equilibria*, In: *Variational Inequalities and Network Equilibrium Problems*, Proceedings of the International School of Mathematics “G. Stampacchia” 19th Course on Variational Inequalities and Network Equilibrium Problems, held June 19–25, 1994, in Erice, Italy, F. Giannessi and A. Maugeri (eds.), Plenum Press, New York, NY, 1995, pp. 169–178.

[2] T. LARSSON AND M. PATRIKSSON, *An augmented Lagrangean scheme for capacitated traffic assignment problems*, In: *Proceedings of the 2nd Meeting of the EURO Working Group on Urban Traffic and Transportation*, Paris, France, September 15–17, 1993, F. Boillot, N. Bhouiri and F. Leurent (eds.), Actes INRETS no. 38, INRETS, Arcueil, France, 1994, pp. 163–199.

[1] O. DAMBERG, J.T. LUNDGREN, AND M. PATRIKSSON, *An algorithm for the stochastic user equilibrium problem*, In: *Proceedings of the 1st Meeting of the EURO Working Group on Urban Traffic and Transportation*, Landshut, Germany, October 1–3, 1992, J. C. M. Baños, B. Friedrich, M. Papageorgiou and H. Keller (eds.), Technical University of Munich, Munich, Germany, 1993.

#### F. Articles in Nonrefereed Conference Proceedings

[2] M. PATRIKSSON, *A descent algorithm for a class of generalized variational inequalities*, In: *Proceedings of the 3rd Meeting of the Nordic Section of the Mathematical Programming Society*, Linköping, Sweden, February 12–13, 1994, K. Holmberg (ed.).

[1] M. PATRIKSSON, *Gap functions for variational inequalities*, In: *Mathematical Programming in Decision and Planning*, Nordisk Forskerkursus, Sandbjerg Slot, Sønderborg, Denmark, September 24–October 2, 1990, Publication No: 90/15, Afdelning for Operationsanalyse, Aarhus Universitet, Aarhus, Denmark, pp. 179–182.

#### G. Popular Articles and Journey Accounts

[2] A.-B. STRÖMBERG AND M. PATRIKSSON, *Discrete optimization at Mathematical Sciences, Chalmers and University of Gothenburg: Modeling and solving real-world problems*, ORbit medlemsblad for Dansk Selskab for Operationsanalyse og Svenska Operationsanalyföreningen, issue 18 (2011), pp. 12–18.

[1] M. PATRIKSSON, *Reseberättelse*, Svenska Operationsanalyföreningens Nyhetsmeddelande, no. 1–2 (1991), pp. 7–9 (in Swedish).

#### H. Book reviews

[1] M. PATRIKSSON, *Network Science, Nonlinear Science and Infrastructure Systems* by

T. L. Friesz (ed.), in *International Series in Operations Research and Management Science*, vol. 102, Springer-Verlag, 2007. Review published in *Journal of Regional Science*, vol. 49, no. 5, December 2009, pp. 1005–1008.

### I. Submitted Manuscripts

[3] T. ALMGREN, N. ANDRÉASSON, M. PATRIKSSON, A.-B. STRÖMBERG, AND A. WOJCIECHOWSKI: The opportunistic replacement problem: analysis and case studies, submitted to *Mathematical Methods of Operations Research* (2012).

[2] M. DANEVA, M. GÖTHE-LUNDGREN, T. LARSSON, M. PATRIKSSON, AND C. RYDERGREN, *A sequential linear programming algorithm with multi-dimensional search—Derivation and convergence*, Report, Department of Mathematics, Linköping University, Linköping, Sweden (2007), under revision for *Optimization Methods and Software*.

[1] T. LARSSON, A. MIGDALAS, AND M. PATRIKSSON, *A generic column generation scheme*, Report LiTH-MAT-R-94-18, Department of Mathematics, Linköping Institute of Technology, Linköping, Sweden (2005), under revision for *Optimization Methods and Software*.

### J. Unpublished Reports

[10] T. ALMGREN, N. ANDRÉASSON, M. PATRIKSSON, A.-B. STRÖMBERG, AND A. WOJCIECHOWSKI, *The replacement problem: A polyhedral and complexity analysis. The complete version*, Report, Mathematical Sciences, Chalmers University of Technology, and Mathematical Sciences, Göteborg University, SE-412 96 Gothenburg, Sweden (2009).

[9] T. ALMGREN, N. ANDRÉASSON, D. ANEVSKI, M. PATRIKSSON, A.-B. STRÖMBERG, AND J. SVENSSON, *Optimization of opportunistic replacement activities: A case study in the aircraft industry*, Report, Mathematical Sciences, Chalmers University of Technology, and Mathematical Sciences, Göteborg University, SE-412 96 Gothenburg, Sweden (2007).

[8] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Convergence properties of a divergent subgradient algorithm for inconsistent linear programs*, Report, Department of Mathematics, Chalmers University of Technology, Göteborg, Sweden (in preparation).

[7] F. ALTENSTEDT AND M. PATRIKSSON, *Policy optimization: Parameterized decision rules vs. stochastic programming for asset liability management*, Report, Department of Mathematics, Chalmers University of Technology, Göteborg, Sweden (2003).

[6] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Optimeringslära* (in Swedish).

[5] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Ergodic primal solutions from dual subgradient schemes in discrete optimization*, Report, Department of Mathematics, Chalmers University of Technology, Göteborg, Sweden (in preparation).

[4] T. LARSSON, M. PATRIKSSON, AND A.-B. STRÖMBERG, *Ergodic convergence in subgradient optimization*, Report, Department of Mathematics, Linköping Institute of Technology, Linköping, Sweden (1997).

[3] T. LARSSON, M. PATRIKSSON, AND C. RYDERGREN, *Simplicial decomposition algorithms with nonlinear column generation*, Report, Department of Mathematics, Linköping Institute of Technology, Linköping, Sweden (1996).

[2] M. PATRIKSSON, *A taxonomy of classes of descent algorithms for nonlinear programs and variational inequalities*, Report LiTH-MAT-R-94-07, Department of Mathematics, Linköping Institute of Technology, Linköping, Sweden (1994). Revised version, Department of Mathematics, Box 354350, University of Washington, Seattle, WA 98195-4350 (1994).

[1] M. PATRIKSSON, *On the properties of solution sets of monotone variational inequalities*, Report LiTH-MAT-R-93-21, Department of Mathematics, Linköping Institute of Technology, Linköping, Sweden (1993).

## ORAL PRESENTATIONS

### K. Invited Lectures

[21] *Discrete optimization at Mathematical Sciences, Chalmers: Modeling and solving real-world problems*, at the Annual Meeting of the Swedish Operational Research Society (SOAF), Göteborg, Sweden, March 15, 2011 (with Ann-Brith Strömberg).

[20] *Optimization models for maintenance planning*, at the Annual International Maintenance Excellence Conference (IMEC), Toronto, Canada, September 21–24, 2010.

[19] *Biologically based IMRT optimization including uncertainties of input parameters*, at

ESTRO 27, Gothenburg, Sweden, September 14–18, 2008.

[18] *Optimeringsmodeller i kvantitativ logistik: Omfattning och möjligheter*, at Eurolog / Logistics & Transport Conference 2008, Gothenburg, Sweden, May 20–22, 2008.

[17] *On the applicability of bilevel optimization models in transportation science - A study of the existence and robustness of solutions to SMPEC models*, at the symposium on Networks: Modelling and Control organised by the Royal Society, London, September 24–25, 2007.

[16] *Maintenance optimization*, at FCC (Fraunhofer–Chalmers Research Centre for Industrial Mathematics), Gothenburg, Sweden, May 14, 2007.

[15] *Optimization that utilizes simulation*, at the meeting arranged by STM (Stiftelsen tillämpad matematik) and FCC (Fraunhofer–Chalmers centrum för industrimatematik), Stenungsbaden, Stenungsund, Sweden, October 14, 2004.

[14] *Robust design*, at the meeting arranged by STM (Stiftelsen tillämpad matematik) and FCC (Fraunhofer–Chalmers centrum för industrimatematik), Stenungsbaden, Stenungsund, Sweden, October 13, 2004.

[13] Seminar series on sensitivity analysis of variational inequality problems, University of Modena, Modena, Italy, November, 2000.

[12] *Traffic equilibrium models and algorithms*, INRIA, Rocquencourt, France, October 25, 2000.

[11] *Ergodic primal convergence for mixed integer programming problems*, PRiSM, Université de Versailles, October 20, 1999.

[10] *Mathematical programs with equilibrium constraints*, PRiSM, Université de Versailles, October 13, 1999.

[9] *Column generation approaches*, PRiSM, Université de Versailles, October 6, 1999.

[8] Seminar series on convergence theory for convex programming and variational inequality problems, University of Modena, Modena, Italy, June 1999.

[7] *Primal and dual convergence in Lagrangean relaxation schemes for convex and combinatorial optimization*, PRiSM, Université de Versailles, June 10, 1997.

[6] *Traffic management through link tolls—New developments*, INRETS, Paris, June 3, 1997.

[5] *Equilibrium problems with side constraints*, at Equilibrium and Advanced Transportation Modelling Colloquium, organized on the occasion of the 25th Anniversary of Centre de recherche sur les transport (CRT), Université de Montréal, Montréal, Canada, October 10–11, 1996.

[4] *Side constraints in traffic assignment*, Centre de recherche sur les transport, Université de Montréal, Montréal, Canada, September 8, 1995.

[3] *Parallel cost approximation algorithms for differentiable optimization*, at the Nordic Summer Course on Mathematical Programming and Parallel Algorithms, Rimforsa, Sweden, August 7–16, 1995.

[2] Seminar Series on optimization methods with application to the field of transportation, University of York and University of Leeds, England, Autumn 1993 and Summer 1994.

[1] *Five years of research at the Division of Optimization in Linköping*, University of Oslo, Norway, October 14, 1993.

#### L. Conference Presentations ([I] Invited, [R] Refereed)

[36] M. PATRIKSSON, *On the solution of robust traffic network design and pricing problems*, at the TRISTAN VII, Tromsø, Norway, June 20–25, 2010.

[35] M. PATRIKSSON, *Robusta tullscheman i trafikplanering*, at the Transportforum, Linköping, Sweden, January 8–9, 2009.

[34] M. PATRIKSSON, *On the existence and computation of robust solutions in hierarchical optimization*, at the Workshop on Robust Multiobjective Design Optimization with Simulation, Fraunhofer-Chalmers Research Centre for Industrial Mathematics (FCC), Gothenburg, Sweden, December 3–4, 2007.

[33] [I] M. PATRIKSSON, *On the applicability and solution of bilevel optimization models in transportation science: A study on the existence, stability and computation of solutions to SMPEC models*, at the Discussion Meeting “Networks: modelling and control”, The Royal Society, London, September 24–25, 2007.

[32] *A survey on the continuous nonlinear resource allocation problem*, at the 21st EURO Conference, Reykjavik, Iceland, July 2–6, 2006.

- [31] *Global optimality conditions for discrete and nonconvex optimization, with applications to Lagrangian heuristics and column generation*, at the Nordic MPS '04, the Ninth Meeting of the Nordic Section of the Mathematical Programming Society, Norrköping, Sweden, October 22–23, 2004.
- [30] [R] *A precise sensitivity analysis of traffic equilibria, with applications*, at the TRISTAN V, Le Gosier, Guadeloupe, French West Indies, June 13–18, 2004.
- [29] *Global optimality conditions for discrete and nonconvex optimization, with applications to Lagrangian heuristics and column generation*, at the ISMP 2003, Technical University of Denmark, Copenhagen, Denmark, August 18–22, 2003.
- [28] [I] *Sensitivity analysis of traffic equilibria revisited*, at the ICCP 2002, University of Cambridge, Cambridge, England, July 29–August 2, 2002.
- [27] [R] *Sensitivity analysis of traffic equilibria revisited*, at the TRISTAN IV, São Miguel, The Azores, Portugal, June 13–19, 2001.
- [26] [I] *Sensitivity analysis of traffic equilibria revisited*, at the Transportforum i Linköping, Linköpings Konsert och Kongress, January 13–14, 2001.
- [25] [I] *A mathematical model and descent algorithm for bilevel traffic management*, at the 8th Meeting of the EURO Working Group on Transportation, Rome Jubilee 2000 Conference, Rome, September 11–14, 2000.
- [24] *Column generation/simplicial decomposition for smooth convex optimization and variational inequality problems*, at ISMP2000—16th International Symposium on Mathematical Programming, Atlanta, GA, August 7–11, 2000.
- [23] [I] *A mathematical model and descent algorithm for bilevel traffic management*, at the Equilibrium Problems and Variational Models workshop, Erice, June 23–July 2, 2000.
- [22] [I] *Structural topology optimization problems including unilateral constraints and stochastic loads*, at the ICM Workshop on Optimization in Solid and Fluid Mechanics, Linköping university, Division of Mechanics, February 9–10, 2000.
- [21] [R] *A class of column generation/simplicial decomposition algorithms in convex differentiable optimization*, at the Sixth SIAM Conference on Optimization, Atlanta, May 10–13, 1999.
- [20] [I] *Mathematical models for optimal traffic management*, at Transportforum i Linköping, Linköpings Konsert och Kongress, January 13–14, 1999.
- [19] [I] *A decision tool for traffic management*, at Equilibrium Problems and Variational Problems: International Workshop in Memory of Marino De Luca, Hotel Villa Diodoro, Taormina, Italy, December 3–6, 1998.
- [18] [R] *Adaptive SQP methods for non-strictly monotone variational inequality problems*, at the 28th Course, Nonlinear Optimization and Applications, of the International School of Mathematics “G. Stampacchia,” Erice, Italy, June 23–July 2, 1998.
- [17] [I] *Opportunities for optimisation techniques in transport*, at the workshop MUSIC + INCOME: Managing Transport Using Traffic Control, Zürich, Switzerland, March 19, 1998.
- [16] [I] *Traffic management through link tolls—New developments*, at the 16th International Symposium on Mathematical Programming, Lausanne, August 24–29, 1997.
- [15] [I] *Traffic management through link tolls—New developments*, at the EURO XV–INFORMS XXXIV Joint International Meeting, Universitat Politècnica de Catalunya, Barcelona, Spain, July 14–17, 1997.
- [14] [R] *An algorithm for the combined distribution and assignment model*, at the 4th Meeting of the EURO Working Group on Transportation, University of Newcastle upon Tyne, Newcastle upon Tyne, England, September 9–11, 1996.
- [13] [R] *Price-directive traffic management—Applications of side constrained traffic equilibrium models*, at the 4th Meeting of the EURO Working Group on Transportation, University of Newcastle upon Tyne, Newcastle upon Tyne, England, September 9–11, 1996.
- [12] [I] *Traffic management through link tolls—An application of side constrained traffic equilibrium models*, at the 2nd Workshop on Equilibrium Problems with Side Constraints, Lagrangean Theory and Duality, Scilla, Reggio Calabria, Italy, May 17–18, 1996.
- [11] [I] *Applications of nonlinear column generation in simplicial decomposition to nonlinear network flows*, at the Network Optimization Conference, University of Florida, Gainesville, FL, February 12–14, 1996.
- [10] [R] *Equilibrium characterizations of solutions to side constrained asymmetric traffic*

*assignment models*, at the 3rd Meeting of the EURO Working Group on Urban Traffic and Transportation, Universitat Politecnica de Catalunya, Barcelona, Spain, September 27–29, 1995.

[9] [I] *Queue equilibrium characterizations of solutions to side constrained traffic assignment models*, at the Workshop on Equilibrium Problems with Side Constraints, Lagrangean Theory and Duality, Catania, Italy, December 9–10, 1994.

[8] [I] *On the linear convergence of cost approximation algorithms*, at the West Coast Optimization Meeting, Simon Fraser University, Vancouver, Canada, October 28–29, 1994.

[7] [R] *On the relationship between side constrained and asymmetric models of traffic equilibria*, at the 19th Course, Variational Inequalities and Network Equilibrium Problems, of the International School of Mathematics “G. Stampacchia,” Erice, Italy, June 19–25, 1994.

[6] *A descent algorithm for a class of generalized variational inequalities*, at the 3rd Meeting of the Nordic Section of the Mathematical Programming Society, Linköping, Sweden, February 12–13, 1994.

[5] [R] *An augmented Lagrangean scheme for capacitated traffic assignment problems*, at the 2nd Meeting of the EURO Working Group on Urban Traffic and Transportation, Paris, France, September 15–17, 1993.

[4] [R] *An algorithm for the stochastic user equilibrium problem*, at the 1st Meeting of the EURO Working Group on Urban Traffic and Transportation, Landshut, Germany, October 1–3, 1992.

[3] *Simplicial decomposition with disaggregated representation for the traffic assignment problem*, at the 11th EURO Conference, Aachen, Germany, July 16–19, 1991.

[2] [R] *A unified description of some iterative algorithms for traffic equilibria*, at the 7th EURO Summer Institute on Urban Traffic Management, Cetraro, Italy, June 21–July 7, 1991.

[1] *Partial linearization techniques for the traffic assignment problem*, at the Forskerkursus in Discrete Optimization, Afdelning for Operationsanalyse, Aarhus Universitet, Aarhus, Denmark, November 21–23, 1988.

### M. Popular Presentations

[10] *Livet på Chalmers*, at the Alumniträffen, Linköping University, September 9, 2011 (in Swedish).

[9] *Om styrkeområdena Transport och Energi*, at the Institutionsrådet, Chalmers, May 18, 2010 (in Swedish).

[8] (with Ann-Brith Strömberg) *Vacker matematik för hållbar utveckling*, at the Vetenskapsfestivalen, Chalmers, April 21, 2010 (in Swedish).

[7] *Optimering*, guest lecture given in the undergraduate course Matematisk orientering, Chalmers and Göteborg University, November 27, 2009 (in Swedish).

[6] *Optimering*, guest lecture given in the course Naturvetenskap i vardagen, Chalmers and Göteborg University, November 27, 2008 (in Swedish).

[5] *Optimering*, guest lecture given in the undergraduate course Matematisk orientering, Chalmers and Göteborg University, November 24, 2008 (in Swedish).

[4] *Från LEGO till möbler—Att bygga optimalt med råvaror*, at the Sonja Kovalevskydagarna, Chalmers and Göteborg University, November 16–17, 2007 (in Swedish).

[3] *Från LEGO till möbler—Att bygga optimalt med råvaror*, at the Sonja Kovalevskydagarna, Chalmers and Göteborg University, November 17–18, 2006 (in Swedish).

[2] *Optimerings innersta kärna*, at the Informationsdag för nya doktorander, Chalmers, August 29, 2003 (in Swedish).

[1] (with Ann-Brith Strömberg) *Att finna den kortaste vägen—Snören, algoritmer och varför det är trångt i Tingstadstunneln*, at the Vetenskapsfestivalen, Chalmers, April 22, 2002 (in Swedish).

### RESEARCH VISITS

INRIA, Rocquencourt, France, October, 2000

Princeton University (Princeton, NJ, USA), June, 1999

University of Modena, Modena, Italy, June, 1999; November, 2000

PRiSM, Université de Versailles (Versailles, France), June, 1997; October, 1999

University of Washington (Seattle, WA, USA) September, 1994–September, 1995

University of York (Heslington, York, England) September–December, 1993; August–Sep-

tember, 1994

Polytechnic University of Catalunya (Barcelona, Spain) July, 1991

### RESEARCH VISITORS

Myrna Palmgren, The University Hospital in Linköping, December 2006, February, April, and November 2007, January 2008

Lina Bertling, Royal Institute of Technology (Stockholm), December 2006, April 2007

R. Tyrrell Rockafellar, University of Washington (Seattle, WA, USA), May, 1999; November, 1999; May, 2002

Patrice Marcotte, Centre de recherche sur les transports, Université de Montréal (Montréal, Canada), March, 1999

Ricardo García, E. U. Politécnica de Almadén, Universidad de Castilla-La Mancha (La Mancha, Spain), 1998

Xiaojun Chen, University of New South Wales (Sydney, Australia), September, 1997

Panos Pardalos, University of Florida (Gainesville, FL, USA), August, 1997

Laura Wynter, University of Versailles (Versailles, France), December, 1996; March, 1997; February, 1998

David Boyce, University of Chicago (Chicago, IL, USA), November–December, 1996

### POSTDOCS AND RESEARCH ASSOCIATES

Mahmood Shafiee, postdoc, 2012–

Torgny Almgren, adjunct professor, 2010–

Mehdi Sharif Yazdi, postdoc, 2010–

Larisa Beilina, research associate, 2009–

Ann-Brith Strömberg, research associate, 1998–2002

### ACADEMIC CONTACTS

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Martin Bendsoe, Department of mathematics, Technical University of Denmark, Lyngby, Denmark ([M.P.Bendsoe@mat.dtu.dk](mailto:M.P.Bendsoe@mat.dtu.dk))

David Boyce, emeritus, Department of civil and materials engineering, University of Illinois at Chicago, Chicago, IL, USA ([dboyce@uic.edu](mailto:dboyce@uic.edu))

Torbjörn Larsson, Department of mathematics, Linköping University, Linköping, Sweden ([tolar@mai.liu.se](mailto:tolar@mai.liu.se))

Patrice Marcotte, DIRO and CRT, University of Montreal, Montreal, Canada ([marcotte@iro.umontreal.ca](mailto:marcotte@iro.umontreal.ca))

Ángel Marín, Departamento Matemática Aplicada, E.T.S. Ingenieros Aeronáuticos, Madrid, Spain ([amarin@dmae.upm.es](mailto:amarin@dmae.upm.es))

R. Tyrrell Rockafellar, Department of mathematics, University of Washington, Seattle, WA, USA ([rtr@math.washington.edu](mailto:rtr@math.washington.edu))

Clas Rydergren, ITN, Linköping University, Norrköping, Sweden ([clryd@itn.liu.se](mailto:clryd@itn.liu.se))

Michael J. Smith, Department of mathematics, University of York, Heslington, York, United Kingdom ([mjs7@york.ac.uk](mailto:mjs7@york.ac.uk))

David Watling, Institute for Transport Studies (ITS), University of Leeds, Leeds, United Kingdom ([D.P.Watling@its.leeds.ac.uk](mailto:D.P.Watling@its.leeds.ac.uk))

### INDUSTRIAL CONTACTS

**CD-Adapco**, Bellevue, WA, USA:

M.Sc. Olof Dahlberg, Supervisor CFD Engineering Services

([olof.dahlberg@us.cd-adapco.com](mailto:olof.dahlberg@us.cd-adapco.com))

**Fraunhofer–Chalmers Research Centre for Industrial Mathematics (FCC)**, Gothenburg:

Dr. Uno Nävert, director ([Uno.Navert@fcc.chalmers.se](mailto:Uno.Navert@fcc.chalmers.se)),

Dr. Stefan Jakobsson, applied researcher ([stefan.jakobsson@fcc.chalmers.se](mailto:stefan.jakobsson@fcc.chalmers.se))

**IBM Watson Research Center**, Yorktown Heights, NY, USA:

Dr. Laura Wynter ([lwynter@us.ibm.com](mailto:lwynter@us.ibm.com))



**Innovativ Vision (IV)**, Linköping:

Dr. Björn Lindskog, technical director (bjorn.lindskog@ivab.se)

**ITWM**, Kaiserslautern, Germany:

Dr. Karl-Heinz Küfer (Karl-Heinz.Kuefer@itwm.fraunhofer.de)

**Jeppesen Systems AB**, Gothenburg:

Dr. Curt Hjorring, optimization specialist (curt@carmen.se)

**Micropos Medical AB**, Gothenburg:

Dr. Tomas Gustafsson, CEO (tomas.gustafsson@micropos.se)

MSc. Roman Iustin (roman.iustin@micropos.se)

**Sahlgrenska Universitetssjukhuset (SU)**, Gothenburg:

Prof. Karl-Axel Johansson, terapeutisk radiofysik (karl-axel.johansson@vgregion.se),

Dr. Anna Bäck, terapeutisk radiofysik (anna.back@radfys.gu.se)

MSc. Caroline Olsson, terapeutisk radiofysik (caroline.olsson@vgregion.se),

Dr. Thomas Björk-Eriksson, onkologi (thomas.bjork-eriksson@oncology.gu.se)

**Statens Institut för Kommunikationsanalys (SIKA)**, Stockholm:

Docent Henrik Edwards (henrik.edwards@sika-institute.se)

**Sydkraft AB**, Malmö:

Joakim Holfeldt (Joakim.Holfeldt@sydkraft.se)

**United Computer Systems AB (UCS)**, Linköping:

Dr. Saied Ghannadan, managing director (saied@ucs.se)

**Volvo Cars (VCC)**, Gothenburg:

Dr. Johan Lennblad (jlennbla@volvocars.com),

Dr. Sören Eriksson (serikss5@volvocars.com)

Dr. Mathias Ljungqvist (mljungqv@volvocars.com)

Dr. Mårten Levenstam (mlevenst@volvocars.com)

**Volvo PowerTrain**, Gothenburg:

Dr. Johan Wallesten (johan.wallesten@volvo.com)

Dr. Dimitri Lortet (dimitri.lortet@volvo.com)

**Volvo Teknisk Utveckling (VTD)**, Gothenburg:

Dr. Gunnar Björkman (Gunnar.Bjorkman@volvo.com)

**Volvo 3P**, Gothenburg:

Dr. Stefan Edlund (stefan.h.edlund@volvo.com)

**Volvo Aero (VAC)**, Trollhättan:

Dr. Torgny Almgren (Torgny.Almgren@volvo.com),

Fredrik Plyhm (Fredrik.Plyhm@volvo.com),

Torbjörn Hillerström (Torbjorn.Hillerstrom@volvo.com)

## SOFTWARE DEVELOPED

*DSD*: A disaggregate simplicial decomposition algorithm for the solution of the traffic equilibrium problem (1989–1990 and 1998–1999). The Fortran software has been distributed to and used by the Swedish Road and Traffic Research Institute (VTI) and several transportation research groups in Europe and North America, and was also included in the commercial transportation planning software VIPS, before it was bought by the German company PTV.

## RESEARCH PROJECTS ([A] Grant applicant, [C] Grant co-applicant), [Amount granted]

2011–2014

[A] *Development of mathematical models and methods for optimal condition based maintenance, especially within energy production and energy-intensive industry*, supported by Energimyndigheten (Swedish Energy Agency) [4.02M SEK]

- 2010–2014** [C] *Chalmers Sustainable Transport Initiative* supported by VINNOVA [46M SEK]
- 2010–2014** [C] *Chalmers Energy Initiative* supported by Energimyndigheten (Swedish Energy Agency) [58M SEK]
- 2009–2012** [C] *Decision support for optimum scheduling of production of aircraft engine components*, supported by VINNOVA (The Swedish Research Council) [1.75M SEK]
- 2008–2012** [C] *Optimum scheduling of a multi-task cell*, supported by Vetenskapsrådet (VR) (The Swedish Research Council) [1.724M SEK]
- 2008–2010** [A] *Development of generic mathematical optimization models and algorithms for the solution of opportunistic and preventive maintenance planning problems in industry*, supported by Energimyndigheten (Swedish Energy Agency) [1.95M SEK]
- 2007–2009** [C] *Process integration—multiparameter optimization*, supported by Energimyndigheten (Swedish Energy Agency) [0.3M SEK]
- 2006–2008** [C] *Aircraft engine maintenance*, supported by Volvo Aero and NFFP (grant NFFP515) [1.2M SEK]
- 2006–2011** [C] *GMMC—Gothenburg Mathematical Modelling Center*, supported by SSF [22M SEK]
- 2005** [C] *GMMC—Gothenburg Mathematical Modelling Center*, application update grant supported by SSF [0.1M SEK]
- 2005** [C] *Toward the development of techniques for designing equitable, efficient & acceptable urban transport systems*, continuation grant supported by Volvo Research Foundation, Volvo Educational Foundation, and Dr. Pehr G. Gyllenhammar Research Foundation (grant SP-U03/24) [0.8M SEK]
- 2004–2005** [C] *Mathematical simulation of reactors*, supported by Akzo Nobel Surface Chemistry [0.3M SEK]
- 2004–2005** [C] *Aircraft engine maintenance*, supported by Volvo Aero and NFFP (grant NFFP515) [0.8M SEK]
- 2004** [C] *Toward the development of techniques or designing equitable, efficient & acceptable urban transport systems*, supported by Volvo Research Foundation, Volvo Educational Foundation, and Dr. Pehr G. Gyllenhammar Research Foundation [0.8M SEK]
- 2003–2004** [A] *Mathematical models and optimization methods for robust optimal design*, supported by VR (The Swedish Research Council) (grant 2002-5780), [0.974M SEK]
- 2001–2004** [C] *Aircraft engine maintenance*, supported by Volvo Aero and NFFP (grant NFFP485) [2.8M SEK]
- 2001–2003** [A] *Optimization under uncertainty for Livia*, supported by Nordea Liv [1.5M SEK]
- 1999–2000** [A] *Guest researchers at Chalmers 1999 and 2000*, supported by KFB (the Swedish Transport and Communications Research Board) (grant KFB 1999-0045), [0.06M SEK]
- 1998–2000** [A] *Mathematical models and optimization methods for robust optimal design*, supported by TFR (the Swedish Research Council for Engineering Sciences) (grant TFR 98-125), [0.99M SEK]

- 1998–1999** [C] *Planning, analysis and management of flows in traffic networks—Optimization models and methods*, supported by KBF (the Swedish Transport and Communications Research Board) (grant KFB 1998-0185), [1.26M SEK]
- 1998** [A] *Conference support, 6th Meeting of the EURO Working Group on Transportation*, supported by KFB (the Swedish Transport and Communications Research Board), [0.075M SEK]
- 1998–2000** [A] *New natural and technical sciences projects*, supported by Chalmers Stiftelse (Chalmers Foundation) (grant C 43-97) [0.45M SEK]
- 1996–1998** [C] *Planning, analysis and management of flows in traffic networks—Optimization models and methods*, supported by KFB (the Swedish Transport and Communications Research Board) (grant KFB 96-206-33)
- 1995–1996** [C] *Development of a program package for traffic assignment*, supported by KFB (the Swedish Transport and Communications Research Board) (grant KFB 95-122-33), [0.415M SEK]
- 1994–1995** [A] *Variational inequalities and saddle point problems—An algorithmic analysis*, supported by TFR (the Swedish Research Council for Engineering Sciences) (grant 282-93-1195) [postdoctoral scholarship]
- 1993–1994** [A] *Research stay at the University of York*, supported by TFB (the Swedish Transport and Communications Research Board) (grant TFB 93-131-63) [25K SEK], the Swedish Institute (grant 303 GH/MLH) [2K SEK], and the Royal Swedish Academy of Sciences, [0.237M SEK]
- 1992–1996** [C] *Equilibria in transportation networks—development of mathematical models and methods*, supported by TFB (the Swedish Transport and Communications Research Board) (grants TFB 92-128-63 and KFB 95-118-63)
- 1989–1992** *System and Scenario Simulation for Testing RTI Systems (ASTERIX)*, EEC DRIVE program, Project V1054
- 1988–1992** *Methods for planning and control of person traffic in urban areas*, supported by TFB (the Swedish Transport and Communications Research Board) (grant TFB 16/88-62)

## RESEARCH ADVISEMENT

### Ph.D. Students

- Magnus Önnheim Advisor, 2011–  
Subject: Optimal scheduling of maintenance operations, especially in power production  
Affiliation: Department of mathematical sciences, Chalmers University of Technology
- Kalle Karttunen Assistant advisor, 2010– (main advisor Elena Kabo)  
Subject: Progressive degradation of rails and wheels  
Affiliation: Department of CHARMEC (Chalmers Railway Mechanics), Department of Applied Mechanics, Chalmers University of Technology
- Emil Gustavsson Assistant advisor and examiner, 2010– (main advisor: Ann-Brith Strömberg)  
Subject: Maintenance planning for rails and wheels  
Affiliation: Department of mathematical sciences, University of Gothenburg
- Åsa Holm Assistant advisor, 2010–11 (main advisor: Torbjörn Larsson)  
Subject: Optimization of brachy therapy  
Affiliation: Department of mathematics, Linköping University

- Karin Thörnblad      Advisor, 2008–  
 Subject: Optimal scheduling of a production cell with multiple resources  
 Licentiate thesis: *On the optimization of schedules of a multitask production cell* (2011)  
 Affiliation: Volvo Aero, Trollhättan, and Department of mathematical sciences, Chalmers University of Technology
- Adam Wojciechowski      Advisor, 2007–  
 Subject: Combinatorial optimization for optimal maintenance operations  
 Licentiate thesis: *On the optimization of opportunistic maintenance activities* (2010)  
 Affiliation: Department of mathematical sciences, Chalmers University of Technology
- Elina Rönnerberg      Assistant advisor, 2006–08; 2009–11 (main advisor: Torbjörn Larsson)  
 Subject: Integer programming  
 Affiliation: Department of mathematics, Linköping University
- Peter Lindroth      Advisor, 2005–11  
 Subject: Truck configuration optimization  
 Ph.D. thesis: *Truck Configuration from a Mathematical Optimization Perspective* (2011)  
 Licentiate thesis: *Product configuration with respect to multiple criteria: A mathematical programming approach* (2008)  
 Affiliations: Volvo 3P, Gothenburg, and Department of mathematical sciences, Chalmers University of Technology
- Anna Nyström      Advisor, 2004–10  
 Subject: Optimal batch processes  
 Licentiate thesis: *Modeling and Simulation of a Multi Phase Semi-batch Reactor* (2007)  
 Affiliation: Department of mathematical sciences, Chalmers University of Technology
- Julia Nilsson      Assistant advisor, 2007–09 (main advisor: Lina Bertling)  
 Subject: Maintenance optimization  
 Licentiate thesis: *On maintenance management of wind and nuclear power plants* (2009)  
 Affiliation: Department of electrical engineering, Royal Institute of Technology, Stockholm
- Francois Besnard      Assistant advisor, 2007– (main advisor: Lina Bertling)  
 Subject: Maintenance optimization  
 Licentiate thesis: *On optimal maintenance management for wind power systems* (2009)  
 Affiliation: Department of electrical engineering, Royal Institute of Technology, Stockholm
- Christoffer Cromvik      Advisor, 2007–09  
 Subject: Robust multiobjective optimization with equilibrium constraints  
 Ph.D. thesis: *Nonlinear Programming—Robust Models and Applications* (2009)  
 Affiliation: Department of mathematical sciences, Chalmers University of Technology
- Michael Nganda      Assistant advisor, 2003–2007 (main advisor: Jöran Bergh)  
 Subject: Waste management in Uganda  
 Licentiate thesis: *Mathematical models in municipal solid waste management* (2007)

- Affiliation: Department of mathematics, Chalmers University of Technology
- Niclas Andreasson    Advisor, 2001–06  
 Subject: The maintenance of aircraft engines under uncertainty  
 Licentiate thesis: *Optimization of opportunistic replacement activities in deterministic and stochastic multi-component systems* (2004)  
 Affiliation: Department of mathematics, Chalmers University of Technology; Volvo Aero, Trollhättan
- Mattias Grönkvist    Assistant advisor, 2001–05 (main advisor: Dag Wedelin)  
 Subject: Fleet scheduling  
 Ph.D. thesis: *The tail assignment problem* (2005)  
 Licentiate thesis: *Tail assignment—A combined column generation and constraint programming approach* (2003)  
 Affiliation: Computer science, Chalmers University of Technology; Carmen Systems, Gothenburg
- Anton Evgrafov        Advisor, 2000–04  
 Subject: Topology optimization of mechanical structures under uncertainty  
 Ph.D. thesis: *Approximation of topology optimization problems using sizing optimization problems* (2004)  
 Licentiate thesis: *Stochastic Optimization of Structural Topology* (2002)  
 Affiliation: Department of mathematics, Chalmers University of Technology
- Jacob Hultén          Advisor, 1999–2001  
 Subject: Optimization of jet engines  
 Licentiate thesis: *Waterjet inlet design optimization using CFD and direct search* (2001)  
 Affiliation: Kamewa/Rolls-Royce, Gothenburg; Department of mathematics, Chalmers University of Technology
- Emad Nassar          Advisor, 1999–2001  
 Subject: Traffic planning and management, bilevel optimization  
 Affiliation: Department of mathematics, Chalmers University of Technology
- Fredrik Altenstedt    Advisor, 1998–2003  
 Subject: Stochastic programming approaches for insurance companies  
 Ph.D. thesis: *Aspects on asset liability management via stochastic programming* (2003)  
 Licentiate thesis: *Asset-liability management via stochastic programming for a Swedish life insurance company* (2001)  
 Affiliation: Department of mathematics, Chalmers University of Technology
- Tuomo Takkula        Assistant advisor, 1998–2003 (main advisor: Dag Wedelin)  
 Subject: Integer optimization for airline scheduling  
 Ph.D. thesis: *Aspects of duality in integer programming* (2003)  
 Licentiate thesis: *The dual of integer linear programs* (2001)  
 Affiliation: Department of computer science, Chalmers University of Technology
- Clas Rydergren        Assistant advisor, 1996–2001 (main advisor: Torbjörn Larsson)  
 Subject: Operations research for transportation planning and control  
 Ph.D. thesis: *Decision Support for Strategic Traffic Management: An Optimization-Based Methodology* (2001)  
 Affiliation: Department of mathematics, Linköping University

Ann-Brith Strömberg Assistant advisor, 1996–1997  
Subject: Nonsmooth optimization  
Ph.D. thesis: *Conditional Subgradient Methods and Ergodic Convergence in Nonsmooth Optimization* (1997)  
Affiliation: Department of mathematics, Linköping University

Zuangwei Liu Assistant advisor, 1991–1992  
Subject: Nonsmooth optimization, Lagrangian relaxation  
Ph.D. thesis: *A Lagrangean Dual Scheme for Structured Linear Programs with Applications and Extensions* (1992)  
Affiliation: Department of mathematics, Linköping University

#### M.Sc. Theses

- Torbjörn Wasterlid (2011–12) (joint with Anders Sjögren, Admeta)
- Christoffer Strömberg *Resource allocation: A numerical study* (2011)
- Staffan Häglund *A surrogate-based parameter tuning heuristic for Carmen crew optimizers* (2010) (joint with Andreas Westerlund, Jeppesen Systems AB) (winner of the 2011 Masters thesis award, presented March 15, 2011, by the Swedish Operational Research Society, SOAF)
- Emil Gustavsson *Maintenance optimization in stochastic multicomponent systems: A dynamic programming approach* (2010) (joint with A.-B. Strömberg and A. Wojciechowski)
- Fredrik Hellman *Towards the solution of large-scale and stochastic traffic network design problems* (2009–10) (joint with C. Cromvik)
- Patrik Fagerfjäll *Optimizing wind farm layout — more bang for the buck using mixed integer linear programming* (2009–10) (joint with A.-B. Strömberg)
- Karin Kwickström *Modelling, testing and analysis of maintenance problems in nuclear power plants* (2009–10) (joint with A.-B. Strömberg and A. Wojciechowski)
- Magnus Önnheim *The facial structure of and efficient solution methods for the opportunistic replacement problem* (2009–10) (joint with A.-B. Strömberg and A. Wojciechowski)
- Barbara Wilhelm *Application of the neighbourhood approximation algorithm to selected benchmark functions* (2007) (examiner)
- Johan Rudholm *An algorithm for the global optimization of expensive and noisy black box functions*, Fraunhofer–Chalmers Research Centre for Industrial Mathematics (FCC) (2007) (joint with S. Jakobsson, FCC)
- Adam Wojciechowski *An algorithm for the global optimization of expensive and noisy black box functions*, Fraunhofer–Chalmers Research Centre for Industrial Mathematics (FCC) (2007) (joint with S. Jakobsson, FCC)
- Einar Gudfinnsson *Minimax stress structural optimization for a linkage arm*, Fraunhofer–Chalmers Research Centre for Industrial Mathematics (FCC) (2005–06) (joint with A.-B. Strömberg)
- Nikulás Árni Sigfússon *Minimax stress structural optimization for a linkage arm*, Fraunhofer–Chalmers Research Centre for Industrial Mathematics (FCC) (2005–06) (joint with A.-B. Strömberg)
- Tomas Jansson *Optimization of resource allocation in multi-task machines*, Volvo Aero Corporation (2005–06)

- Maja Olsson Uppenberg *Optimisation of fresh water consumption for Doggy AB using simulation*, Doggy AB, Vårgårda (2005)
- Moa Ryberg *Optimisation of fresh water consumption for Doggy AB using simulation*, Doggy AB, Vårgårda (2005)
- Caroline Olsson *Lagrangian heuristics for strictly convex quadratic minimum cost network flow problems* (2004–05)
- Hicham Rifai *Turbojet engine performance modelling using multi-objective optimization algorithms* (2004–05)
- Lova Carlsson *Optimization of beam orientation in intensity modulated radiation therapy using a genetic algorithm*, Sahlgrenska University Hospital (2004–05)
- Lena Krantz *Optimization of beam orientation in intensity modulated radiation therapy using a genetic algorithm*, Sahlgrenska University Hospital (2004–05)
- Carl-Peter Sellman *Ruttplanering för hemtjänsten i Torslanda*, Torslanda hemtjänst (2004–05)
- Mikael Andersson *Route optimization applied to school transports—A method combining column generation with greedy heuristics*, Tekis & Kartena (2004–05)
- Peter Lindroth *Route optimization applied to school transports—A method combining column generation with greedy heuristics*, Tekis & Kartena (2004–05)
- Johan Lööf *Allokering av symmetriska toleranser i komplexa sammansättningar*, Wingqvistlaboratoriet, Chalmers (2004)
- Tomas Hermansson *Allokering av symmetriska toleranser i komplexa sammansättningar*, Wingqvistlaboratoriet, Chalmers (2004)
- Martin Önneflod *Advantages of utilizing new global optimality conditions when constructing column generation algorithms for integer programming problems*, Carmen Systems AB (2003–04)
- Carl Bohman *Black box optimization in engine development*, Volvo Car Corporation (2003–04) (joint with A.-B. Strömberg)
- Jorild Engkvist *Black box optimization in engine development*, Volvo Car Corporation (2003–04) (joint with A.-B. Strömberg)
- Petra Hugosson *Driftoptimering av vattenkraftverken i Helgeå*, Sydkraft Vattenkraft AB, Malmö (2003–04) (joint with A.-B. Strömberg)
- Reine Säljö *Bundle methods for Lagrangian dual optimization problems* (2003–04)
- Magnus Josefsson *Sensitivity analysis of separable traffic equilibria* (2002–03)
- Fredrik Hedenus *Stochastic modelling of bioenergy vs. carbon sinks at the global scale*, Fysikalisk resursteori, Chalmers (2002) (joint with F. Altenstedt)
- Andreas Tapani *Policy optimization in financial planning*, (2001–2002) (joint with F. Altenstedt)
- Mikael Fredriksson *Rule sensitivity analysis for staff planning problems*, Carmen Systems AB (2000–)

Mats Werme	<i>Newton methods for nonmonotone variational inequalities</i> , KTH (2000–2001) (joint with L. Wynter)
Anders Holmström	<i>Model-based optimization techniques in engineering design</i> , Volvo Car Corporation (1999–2000)
Jonas Forsberg	<i>Optimering med NMSQP</i> (1999–2000)
Niklas Eliasson	<i>Nonlinear pricing and surrogate column generation in linear programming</i> (1999) (joint with T. Larsson)
Snorre Christiansen	<i>Structural optimization with subgradient optimization</i> , Université de Versailles (1997) (joint with L. Wynter)
Kinga Ulman	<i>A toll scheme for traffic management</i> (1997)
Clas Rydergren	<i>Regularized simplicial decomposition with application to network flow problems</i> (1995) (joint with T. Larsson)
Patrik Ingström	<i>Simplicial decomposition with quadratic subproblems for the traffic assignment problem</i> (1994) (joint with T. Larsson)
Louise Lychou	<i>Studies of flows on overlapping routes in a stochastic user equilibrium model</i> (1994) (joint with J.T. Lundgren)
Johan Marklund	<i>A study of Lagrangian heuristics for convex network flow problems</i> (1993) (joint with T. Larsson)
Mari Skröder	<i>An experimental comparison between user and system optimum principles</i> , Swedish Road and Traffic Research Institute (VTI), Linköping (1991) (joint with J.T. Lundgren)
Håkan Fortell	<i>Capacitated traffic assignment by an augmented Lagrangean and disaggregate simplicial decomposition</i> (1991) (joint with T. Larsson)

### B.Sc. Theses

J. Lind and P. Mattsson	<i>Metaheuristik för bemanningsplanering av detaljhandelsbutiker</i> (2011) (joint with Elina Rönnberg, Department of Mathematics, Linköping University)
Rasmus Einarsson et al.	<i>Modellering och optimering av schemaläggning vid en ridskola — En fallstudie i heltalsprogrammering</i> (2010) (joint with A.-B. Strömberg)

### RESEARCH ACTIVITIES ([R] Currently resting, [P] Planned)

*Scheduling optimization* (joint with Ann-Brith Strömberg and Karin Thörnblad, Mathematical Sciences at Chalmers)

*Dynamic scheduling of a multi-task machine* (joint with Torgny Almgren, Volvo Aero, Trollhättan, and Ann-Brith Strömberg and Karin Thörnblad, Mathematical Sciences at Chalmers)

*Truck configuration optimization* (joint with Peter Lindroth, Volvo PPP and Ann-Brith Strömberg, Mathematical Sciences at Chalmers)

*Maintenance optimization theory and applications* (joint with Emil Gustavsson, Ann-Brith Strömberg, Adam Wojciechowski, Magnus Önnheim, Mathematical Sciences, and staff at CHARMEC, at Chalmers)

*Robust process integration investments under uncertainty* (joint with Elin Svensson and Thore Berntsson, Heat and Power Technology at Chalmers, and Ann-Brith Strömberg, Mathematical Sciences at Chalmers)

### PUBLISHED PEDAGOGICAL MATERIAL

[2] N. ANDRÉASSON, A. EVGRAFOV, AND M. PATRIKSSON, *Introduction to Continuous Optimization*, Studentlitteratur, Lund, Sweden, 2005.



[1] *Optimization*, Sections 15.2–15.4 in *BETA—Mathematics Handbook for Science and Engineering*, Fifth edition, by L. Råde and B. Westergren, Springer-Verlag, Berlin; Studentlitteratur, Lund, Sweden, 2003.