Curriculum Vitae

September 12, 2017

Name:	Kaj Evert Ragnar Holmberg.
Nationality:	Swedish.
Date of birth:	550623-1934, in Linköping, Sweden.
Family:	Married, three children.
Present Employment:	Professor, Division of Optimization, Department of Mathematics, Linköping Institute of Technology, Sweden.
University Address:	Department of Mathematics Linköping Institute of Technology S-581 83 Linköping, Sweden Telephone: Int.prefix-13-282867, Secretary 281405
Home Address:	Kvinnebyvägen 246 SE-589 33 Linköping, Sweden Telephone: Int.prefix-13-295058

Education:
"Docent" (Swedish postdoctoral exam, habilitation) in Optimization 1992,
Department of Mathematics, Linköping Institute of Technology, Sweden.

Doctor of Philosophy in Optimization 1985, Department of Mathematics,
Linköping Institute of Technology, Sweden.
Dissertation: *Decomposition in Large Scale Mathematical Programming.*

Licenciate of Technology in Optimization 1984, Department of Mathematics,
Linköping Institute of Technology, Sweden.
Dissertation: *Some Models for Goods Transportation and their Solution Methods.*

Master of Science in Technical Physics and Electrotechnics, 1980,
Specialization: Applied Mathematics, Linköping Institute of Technology, Sweden.
Master Thesis: *Solution Methods for the Stochastic Transportation Problem: A Comparison.*

9 years compulsory school, Skänninge.
4 years upper secondary school,
Kungshögaskolan, Mjölby (year 1-2), Berzeliusskolan, Linköping (year 3-4).
Senior high school diploma 1975, Telecommunications and electrical engineer.

Languages:
English (fluently). German (able to read and understand).

Employment:

2009-2011: Deputy Head of Department, Department of Mathematics,
            Linköping Institute of Technology, Sweden.

2005-   : Head of the Division of Optimization, Department of Mathematics,
            Linköping Institute of Technology, Sweden.

1999-   : Professor, Division of Optimization, Department of Mathematics,
            Linköping Institute of Technology, Sweden.

2001:   Acting head of Department, Department of Mathematics,
            Linköping Institute of Technology, Sweden.

2000-2001: Deputy Head of Department, Department of Mathematics,
            Linköping Institute of Technology, Sweden.

1995-2002: Director of Graduate Studies, Department of Mathematics,
            Linköping Institute of Technology, Sweden.

1992-1999: Associate Professor, Division of Optimization, Department of Mathematics,
            Linköping Institute of Technology, Sweden.

1989-1990: University Lecturer and Researcher (Assistant Professor), Operations Research,
            Department of Mathematics, Aarhus University, Denmark.

1986-1987: Professor (part time), Division of Optimization, Department of Mathematics,
            Linköping Institute of Technology, Sweden.

1985-1992: University Lecturer and Researcher (Assistant Professor), Division of Optimization,
            Department of Mathematics, Linköping Institute of Technology, Sweden.
            (Leave of absence 1989-1990.)

1985-1991: Head of the Transportation Optimization Sector (part time),
            Center of Technology Transfer, Linköping Institute of Technology, Sweden.
            (Leave of absence 1989-1990.)

1982-1985: Researcher (part time), The Transportation and Logistics Sector,
            Center of Technology Transfer, Linköping Institute of Technology, Sweden.

1982-1985: University Lecturer (part time), Division of Optimization
            Department of Mathematics, Linköping Institute of Technology, Sweden.

1980-1985: Research Assistant/PhD-student, Division of Optimization,
            Department of Mathematics, Linköping Institute of Technology, Sweden.

1979-1980: Teaching Assistant (part time), Division of Optimization
            Department of Mathematics, Linköping Institute of Technology, Sweden.

Publications in International Journals: (43 items)

Military Aircraft Mission Planning. (Co-Authors N-H. Quttineh, T. Larsson, K. Lundberg). *EURO Journal on Transportation and Logistics* 31 (2013) pp 49-70.

Optimal Placement of UV-based Communications Relay Nodes. (Co-Authors O. Burdakov, P. Doherty and P-M. Olsson). *Journal of Global Optimization* 48 (2010) pp 511-531.

Relay Positioning for Unmanned Aerial Vehicle Surveillance. (Co-Authors O. Burdakov, P. Doherty, J. Kvarnström and P-M. Olsson). *The International Journal of Robotics Research* 29, (2010) pp 1069-1087.

Heuristics for the Rural Postman Problem. *Computers & Operations Research* 37, (2010) pp 981-990.

Design of OSPF Networks using Subpath Consistent Routing Patterns. (Co-Author P. Broström.) *Telecommunication Systems* 41 (2009) pp 293-309.

Graph Optimization Approaches for Minimal Rerouting in Symmetric Three Stage Clos Networks. *Journal of Mathematical Modelling and Algorithms* 8, (2009) pp 81-100.

Compatible Weights and Valid Cycles in Non-spanning OSPF Routing Patterns. (Co-Author P. Broström.) *Algorithmic Operations Research* 4, (2009) pp 19-35.

Valid Cycles: A Source of Infeasibility in OSPF Routing. (Co-Author P. Broström.) *Networks* 52, (2008) pp 206-215.

Lagrangian Based Heuristics for the Multicommodity Network Flow Problem with Fixed Costs on Paths. (Co-Authors M. Joborn and K. Melin.) *European Journal of Operational Research* 188, (2008) pp 101-108.

Optimization Models for Routing in Switching Networks of Clos Type with Many Stages. *AMO - Advanced Modeling and Optimization* 10:1 (2008).

On the Extremal Structure of an OSPF Related Cone. (Co-Author P. Broström.) *Vietnam Journal of Mathematics* 35, (2007) pp 507-522.

Multiobjective Design of Survivable IP Networks. (Co-Author P. Broström.) *Annals of Operations Research* 147, (2006) pp 235-253.

Mean Value Cross Decomposition for Nonlinear Convex Problems. (Co-Author K. Kiwiel.) *Optimization Methods and Software* 21, (2006) pp 401-417.

Economies of Scale in Empty Freight Car Distribution in Scheduled Railways. (Co-Authors M. Joborn, T.G. Crainic, M. Gendreau and J.T. Lundgren.) *Transportation Science* 38, (2004) pp 121-134.

Bicriteria Network Location (BNL) Problems with Criteria Dependent Lengths and Minisum Objectives. (Co-Authors K.A. Andersen and A.J.V. Skriver.) *European Journal of Operational Research* 156, (2004) pp 541-549.

Optimization of Internet Protocol Network Design and Routing. (Co-Author D. Yuan.) *Networks* 43, (2004) pp 39-53.

A Multicommodity Network-Flow Problem with Side Constraints on Paths Solved by Column Generation. (Co-Author D. Yuan.) *INFORMS Journal on Computing* 15, (2003) pp 42-57.

Ring Network Design by Lagrangean Based Column Generation. (Co-Authors M. Henningsson, M. Rönnqvist and P. Värbrand.) *Telecommunication Systems* 21:2-4, (2002) pp 301-318.

Experiments with Primal-Dual Decomposition and Subgradient Methods for the Uncapacitated Facility Location Problem. *Optimization* 49, (2001) pp 495-516.

A Lagrangean Heuristic Based Branch-and-Bound Approach for the Capacitated Network Design Problem. (Co-Author D. Yuan.) *Operations Research* 48, (2000) pp 461-481.

A Production-Transportation Problem with Stochastic Demand and Concave Production Costs. (Co-Author Hoang Tuy.) *Mathematical Programming* 85, (1999) pp 157-179.

Exact Solution Methods for Uncapacitated Location Problems with Convex Transportation Costs. *European Journal of Operational Research* 114, (1999) pp 127-140.

An Exact Algorithm for the Capacitated Facility Location Problems with Single Sourcing. (Co-Authors M. Rönnqvist and D. Yuan.) *European Journal of Operational Research* 113, (1999) pp 544-559.

A Lagrangean Approach to Network Design Problems. (Co-Author D. Yuan.) *International Transactions in Operational Research* 5, (1998) pp 529-539.

Creative Modeling: Variable and Constraint Duplication in Primal-Dual Decomposition Methods. *Annals of Operations Research* 82, (1998) pp 355-390.

Improved Empty Freight Car Distribution. (Co-Authors M. Joborn and J.T. Lundgren.) *Transportation Science* 32, (1998) pp 163-173.

Solving the Uncapacitated Network Design Problem by a Lagrangean Heuristic and Branch-and-Bound. (Co-Author J. Hellstrand.) *Operations Research* 46, (1998) pp 247-259.

A Lagrangean Heuristic for the Facility Location Problem with Staircase Costs. (Co-Author J. Ling.) *European Journal of Operational Research* 97, (1997) pp 63-74.

Mean Value Cross Decomposition Applied to Integer Programming Problems. *European Journal of Operational Research* 97, (1997) pp 124-138.

Dual Search Procedures for the Exact Formulation of the Simple Plant Location Problem with Spatial Interaction. (Co-Author K. Jörnsten.) *Location Science* 4, (1996) pp 83-100.

Solving the Generalized Knapsack Problem with Variable Coefficients. (Co-Author K. Jörnsten.) *Naval Research Logistics* 43, (1996) pp 673-689.

A Dual Ascent Procedure for the Exact Formulation of the Simple Plant Location Problem with Spatial Interaction. (Co-Author K. Jörnsten.) *Optimization* 36, (1996) pp 139-152.

Efficient Decomposition and Linearization Methods for the Stochastic Transportation Prob-

lem. *Computational Optimization and Applications* 4, (1995) pp 293-316.

A Simple Modification of Dantzig-Wolfe Decomposition. (Co-Author K. Jörnsten.) *Optimization* 34, (1995) pp 129-145.

Cross Decomposition Applied to Integer Programming Problems: Duality Gaps and Convexification in Parts. *Operations Research* 42, (1994) pp 657-668.

On Using Approximations of the Benders Master Problem. *European Journal of Operational Research* 77, (1994) pp 111-125.

Solving the Staircase Cost Facility Location Problem with Decomposition and Piecewise Linearization. *European Journal of Operational Research* 75, (1994) pp 41-61.

A Convergence Proof for Linear Mean Value Cross Decomposition. *Zeitschrift für Operations Research* 39, (1994) pp 157-186.

Linear Mean Value Cross Decomposition: A Generalization of the Kornai-Liptak Method. *European Journal of Operational Research* 62, (1992) pp 55-73.

Generalized Cross Decomposition Applied to Nonlinear Integer Programming Problems: Duality Gaps and Convexification in Parts. *Optimization* 23, (1992) pp 341-356.

On the Convergence of Cross Decomposition. *Mathematical Programming* 47, (1990) pp 269-296.

Exact Methods for Gravity Trip Distribution Models. (Co-Author K. Jörnsten.) *Environment and Planning* A 21, (1989) pp 81-97.

Cross Decomposition Applied to the Stochastic Transportation Problem. (Co-Author K. Jörnsten.) *European Journal of Operations Research* 17, (1984) pp 361-368.

Papers in Conference Proceedings: (29 items)

Inverse Shortest Path Models Based on Fundamental Cycle Bases. (Co-Author M. Call.) Operations Research Proceedings 2011, eds: Diethard Klatte, Hans-Jakob Lüthi, Karl Schmedders.

Generating UAV communication networks for monitoring and surveillance. (Co-Authors O. Burdakov, P. Doherty, J. Kvarnström, P-M. Olsson.) 11th International Conference on Control, Automation, Robotics and Vision, ICARCV 2010.

Optimal Scheduling and QoS Power Control for Cognitive Underlay Networks. (Co-Authors E. Karipidis, E.G. Larsson.) Proceedings of the 3rd IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP'09), 2009.

Positioning Unmanned Aerial Vehicles as Communication Relays for Surveillance Tasks. (Co-Authors O. Burdakov, P. Doherty, J. Kvarnström, P-M. Olsson.) Proceedings of the 5th Robotics, Science and Systems Conference (RSS), Seattle, Washington, June 2009.

Determining the Non-Existence of a Compatible OSPF Metric. (Co-Author P. Broström.) Proceedings of the International Network Optimization Conference, INOC 2005. Eds. L. Gouveia and C. Mourão, University of Lisbon, Portugal.

Design of IP/OSPF Networks Using a Lagrangean Heuristic on an In-graph Based Model. (Co-Author P. Broström.) Proceedings of the International Network Optimization Conference, INOC 2005. Eds. L. Gouveia and C. Mourão, University of Lisbon, Portugal.

Determining the Non-Existence of Compatible OSPF Weights. (Co-Author P. Broström.) Proceedings of the Ninth Meeting of the Nordic Section of the Mathematical Programming Society, (2004). Ed. Di Yuan, Linköping University, Norrköping, Sweden.

Parallel Mean Value Cross Decomposition for Nonlinear Convex Problems. (Co-Author K. Kiwiel.) Proceedings of the Eighth Meeting of the Nordic Section of the Mathematical Programming Society, (2002). Eds. D. Haugland and S.C. Ho, Bergen University, Norway.

Optimal Network Design and Routing for IP Traffic. (Co-Author D. Yuan.) Proceedings of the Third International Workshop on Design of Reliable Communication Networks. Ed. T. Cinkler. Budapest, Hungary, (2001).

A Capacitated Bus Grid Network Design Problem. (Co-Authors M. Henningsson and M. Näsberg.) Proceedings of 8th International Conference on Telecommunication Systems. Ed. B. Gavish. Vanderbilt University, USA, (2000).

A Lagrangean Heuristic for the Multicommodity Network Flow Problem with Fixed Path Costs. (Co-Authors K. Melin and M. Joborn.) Proceedings of the Sixth Meeting of the Nordic Section of the Mathematical Programming Society, (1999). Eds. E. Dotzauser, M. Björkman and K. Holmström, Mälardalen University, Västerås, Sweden.

Mean Value Cross Decomposition Based Branch-and-Bound for Mixed Integer Programming Problems. Operations Research Proceedings 1998, Selected Papers of the International Conference on Operations Research (OR 98). Eds. P. Kall and H.-J. Lüthi. Springer, (1999).

On Extended Models of Multicommodity Routing with Side Constraints on Paths. (Co-Author D. Yuan.) Operations Research Proceedings 1998, Selected Papers of the International Conference on Operations Research (OR 98). Eds. P. Kall and H.-J. Lüthi. Springer, (1999).

A Ring Network Design Problem. (Co-Authors M. Henningsson, M. Rönnqvist and P. Värbrand.) Operations Research Proceedings 1998, Selected Papers of the International Conference on Operations Research (OR 98). Eds. P. Kall and H.-J. Lüthi. Springer, (1999).

A Multicommodity Network Flow Problem with Side Constraints on Paths Solved by Column Generation. (Co-Author D. Yuan.) Proceedings of the Fifth Meeting of the Nordic Section of the Mathematical Programming Society, (1998). Ed. A. Løkketangen, Molde College, Norway.

Mean Value Cross Decomposition Based Branch-and-Bound for Mixed Integer Programming Problems. Proceedings of the Fifth Meeting of the Nordic Section of the Mathematical Programming Society, (1998). Ed. A. Løkketangen, Molde College, Norway.

A Lagrangean Heuristic Based Branch-and-Bound Approach for the Capacitated Network Design Problem. (Co-Author D. Yuan.) Operations Research Proceedings 1996, Selected Papers of the Symposium on Operations Research (SOR 96). Eds. U. Zimmermann, U. Derigs, W. Gaul, R.H. Möhring and K.-P. Schuster. Springer, (1997).

A Lagrangean Heuristic Based Branch-and-Bound Approach for the Capacitated Network Design Problem. (Co-Author D. Yuan.) Proceedings of the Fourth Meeting of the Nordic Section of the Mathematical Programming Society, (1996). Ed. K.A. Andersen, University of Aarhus, Denmark.

A Capacitated Bus Grid Network Design Problem. (Co-Authors M. Henningsson and M. Näsberg.) Proceedings of the Fourth Meeting of the Nordic Section of the Mathematical Programming Society, (1996). Ed. K.A. Andersen, University of Aarhus, Denmark.

Solving Capacitated Facility Location Problems with Single Sourcing Using Lagrangean Heuristics, Repeated Matching and Branch-and-Bound. (Co-Authors M. Rönnqvist and D. Yuan.) Proceedings of the Fourth Meeting of the Nordic Section of the Mathematical Programming Society, (1996). Ed. K.A. Andersen, University of Aarhus, Denmark.

Computational Experiments with an Empty Freight Car Distribution Model. (Co-Authors Martin Joborn and Jan Lundgren.) In: Computers in Railways V - Volume 1: Railway Systems and Management, (1996). Eds. J. Allan, C.A. Brebbia, R.J. Hill, G. Sciutto and S. Sone. Computational Mechanics Publications, Southampton, UK.

The Simple Plant Location Problem with Spatial Interaction: Formulation and Solution Methods. (Co-Author K. Jörnsten.) Operations Research Proceedings 1995, Selected Papers of the Symposium on Operations Research (SOR'95). Eds. P. Kleinschmidt, A. Bachem, U. Derigs, D.Fischer, U. Leopold-Wildburger and R. Möhring. Springer, (1995).

A Lagrangean Heuristic for the Facility Location Problem with Staircase Costs. (Co-Author Jonas Ling.) Operations Research Proceedings 1995, Selected Papers of the Symposium on Operations Research (SOR'95). Eds. P. Kleinschmidt, A. Bachem, U. Derigs, D. Fischer, U. Leopold-Wildburger and R. Möhring. Springer, (1995).

A Model for Allocation of Empty Freight Cars with Capacity Restrictions and Fixed Costs. (Co-Authors Martin Joborn and Jan Lundgren.) In: Computers in Railways IV - Vol 1: Railway Design and Management, (1994). Eds. T.K.S. Murthy, B. Mellitt, C.A. Brebbia, G. Sciutto, S. Sone. Computational Mechanics Publications, Southampton, UK.

A Production-Transportation Problem with Stochastic Demand and Concave Production Costs. (Co-Author Hoang Tuy.) Operations Research '93, GMÖOR (1994). Eds. A. Bachem, U. Derigs, M. Jünger and R. Schrader.

Models for Allocation of Empty Freight Cars. (Co-Authors Martin Joborn and Jan Lundgren.) Proceedings of the Third Meeting of the Nordic Section of the Mathematical Programming Society, (1994). Ed. K. Holmberg, Linköping Institute of Technology, Sweden.

Efficient Decomposition and Linearization Methods for the Stochastic Transportation Problem. Proceedings of the Third Meeting of the Nordic Section of the Mathematical Programming Society, (1994). Ed. K. Holmberg, Linköping Institute of Technology, Sweden.

An Exact Formulation of the Simple Plant Location Problem with Spatial Interaction. (Co-Author K. Jörnsten.) Proceedings of meeting V of the EURO Working Group on Locational Analysis, (1990). Ed. Fr. Orban-Ferauge and J.P. Rasson, Namur, Faculte Universitaires Notre-Dame de-la-Paix, Belgium.

Mean Value Cross Decomposition I: A Convergence Proof. Proceedings of the First Meeting of the Nordic Section of the Mathematical Programming Society (1990), Copenhagen,

Denmark.

Papers in Books: (10 items)

Effect Oriented Planning of Joint Attacks. (Co-Authors N-H. Quttineh, T. Larsson, K. Lundberg.) In: Optimization Theory, Decision Making, and Operations Research Applications, Springer Proceedings in Mathematics & Statistics, 31:49-70, 2013. Eds: Athanasios Migdalas, Angelo Sifaleras, Christos K. Georgiadis, Jason Papathanasiou, Emmanuil Stiakakis.

Complexity of Inverse Shortest Path Routing. (Co-Author M. Call.) In: J. Pahl, T. Reiners, and S. Voß (Eds.): Network Optimization, INOC 2011, Computer Communication Networks and Telecommunications, Lecture Notes in Computer Science, vol 6701, pp 339-353. Springer, Heidelberg (2011).

Optimization of OSPF Routing in IP Networks. (Co-Authors A. Bley, B. Fortz, E. Gourdin, O. Klopfenstein, M. Pioro, A. Tomaszewski and H. Ümit). In: *Graphs and Algorithms in Communication Networks - Studies in Broadband, Optical, Wireless and Ad Hoc Networks*, eds. A. Koster and X. Munoz, Springer, Heidelberg (2010).

Ring Network Design. (Co-Authors M. Henningsson and D. Yuan). In: *Handbook of Optimization in Telecommunications*, eds. M.G.C. Resende and P.M. Pardalos, pp 291-312, Springer Science + Business Media, New York (2005).

Facility Location with Staircase Costs. In: *Encyclopedia of Optimization*, eds. C.A. Floudas and P.M. Pardalos, Kluwer Academic Publishers, Dordrecht (2001).

Stochastic Transportation and Location Problems. In: *Encyclopedia of Optimization*, eds. C.A. Floudas and P.M. Pardalos, Kluwer Academic Publishers, Dordrecht (2001).

Facility Location Problems with Spatial Interaction. In: *Encyclopedia of Optimization*, eds. C.A. Floudas and P.M. Pardalos, Kluwer Academic Publishers, Dordrecht (2001).

Generalized Cross Decomposition. In: *Encyclopedia of Optimization*, eds. C.A. Floudas and P.M. Pardalos, Kluwer Academic Publishers, Dordrecht (2001).

Dantzig-Wolfe Decomposition. In: *Encyclopaedia of Mathematics: Supplement II*, ed. M. Hazewinkel, Kluwer Academic Publishers, Dordrecht (2000).

Primal and Dual Decomposition as Organizational Design: Price and/or Resource Directive Decomposition. In: *Design Models for Hierarchical Organizations: Computation, Information, and Decentralization*, eds. R.M. Burton and B. Obel, pp 61-92, Kluwer Academic Publishers, Boston, USA (1995).

Research Reports: (101 items)

(◇: Department of Mathematics, Linköping Institute of Technology, Sweden.)

2016 Projecting Points on the Convex Hull. Research Report LiTH-MAT-R-2016/06-SE. ◇

2016 The (Over) Zealous Snow Remover Problem. Research Report LiTH-MAT-R-2016/04-SE. ◇

2015 On Using OpenStreetMap and GPS for Optimization. Research Report LiTH-MAT-

R-2015/15-SE. ◇

2015 Heuristics for the weighted k-Chinese/rural postman problem with a hint of fixed costs with applications to urban snow removal. Research Report LiTH-MAT-R-2015/13-SE. ◇

2015 Computational Results for Map Matching by Optimization. Research Report LiTH-MAT-R-2015/02-SE. ◇

2015 Map Matching by Optimization. Research Report LiTH-MAT-R-2015/01-SE. ◇

2014 Formation of Student Groups with the Help of Optimization. Research Report LiTH-MAT-R-2014/14-SE. ◇

2014 Urban Snow Removal: Modeling and Relaxations. Research Report LiTH-MAT-R-2014/08-SE. ◇

2012 Aircraft Mission Planning. (Co-Authors N-H. Quttineh, K. Lundberg and T. Larsson.) Research Report LiTH-MAT-R-2012/07-SE. ◇

2012 Effect Oriented Planning. (Co-Authors N-H. Quttineh, K. Lundberg and T. Larsson.) Research Report LiTH-MAT-R-2012/06-SE. ◇

2009 Optimal Placement of Communications Relay Nodes. (Co-Authors O. Burdakov, P. Doherty and P-M. Olsson.) Research Report LiTH-MAT-R-2009-03. ◇

2008 A Dual Ascent Method for the Hop-Constrained Shortest Path Problem with Application to Positioning of Unmanned Aerial Vehicles. (Co-Authors O. Burdakov and P-M. Olsson.) Research Report LiTH-MAT-R-2008-07. ◇

2008 Heuristics for the Rural Postman Problem with Application to Snow Removal for Secondary Roads. Research Report LiTH-MAT-R-2008-14. ◇

2007 Graph Optimization Approaches for Minimal Rerouting in Symmetric Three Stage Clos Network. Research Report LiTH-MAT-R-2007-12. ◇

2007 Optimization Models for Routing in Switching Networks of Clos Type with Many Stages. Research Report LiTH-MAT-R-2007-11. ◇

2007 Design of OSPF Networks using Subpath Consistent Routing Patterns. (Co-Author P. Broström.) Research Report LiTH-MAT-R-2007-05. ◇

2007 Compatible Weights and Valid Cycles in Non-spanning OSPF Routing Patterns. (Co-Author P. Broström.) Research Report LiTH-MAT-R-2007-04. ◇

2006 On the Extremal Structure of an OSPF Related Cone. (Co-Author P. Broström.) Research Report LiTH-MAT-R-2006-02. ◇

2005 A New Derivation of Valid Cycles. (Co-Author P. Broström.) Research Report LiTH-MAT-R-2005-03. ◇

2004 Lagrangian Based Heuristics for the Multicommodity Network Flow Problem with Fixed Costs on Paths. (Co-Authors M. Joborn and K. Melin.) Research Report LiTH-MAT-R-2004-15. ◇

2004 Mean Value Cross Decomposition Based Branch-and-Bound for Mixed Integer Programming Problems. Research Report LiTH-MAT-R-2004-13. ◇

2004 Stronger Necessary Conditions for the Existence of a Compatible OSPF Metric. (Co-Author P. Broström.) Research Report LiTH-MAT-R-2004-08. ◇

2004 Determining the Non-Existence of a Compatible OSPF Metric. (Co-Author P. Broström.) Research Report LiTH-MAT-R-2004-06. ◇

2004 Multiobjective Design of Survivable IP Networks. (Co-Author P. Broström.) Research Report LiTH-MAT-R-2004-03. ◇

2003 A Column Generation Approach for a Ring Network Design Problem. (Co-Authors M. Henningsson, M. Rönnqvist and P. Värbrand.) Research Report LiTH-MAT-R-2003-21. ◇

2003 A Ring Network Design Problem Solved by a Ring Generation and Allocation Approach. (Co-Authors M. Henningsson, M. Rönnqvist and P. Värbrand.) Research Report LiTH-MAT-R-2003-20. ◇

2003 A Ring Generation Problem Based on the Traveling Salesman Subtour Problem. (Co-Author M. Henningsson.) Research Report LiTH-MAT-R-2003-19. ◇

2003 Calculating Cost Coefficients for Generation of Rings in Network Design. (Co-Author M. Henningsson.) Research Report LiTH-MAT-R-2003-18. ◇

2003 Lagrangean Price Directive Ring Generation for Network Design. (Co-Author M. Henningsson.) Research Report LiTH-MAT-R-2003-17. ◇

2003 A Ring Network Design Problem and Heuristics for Generating a Set of Feasible Rings. (Co-Authors M. Henningsson, M. Rönnqvist and P. Värbrand.) Research Report LiTH-MAT-R-2003-16. ◇

2003 Mean Value Cross Decomposition for Nonlinear Convex Problems. (Co-Author K. Kiwiel.) Research Report LiTH-MAT-R-2003-10. ◇

2002 Economies of Scale in Empty Freight Car Distribution in Scheduled Railways. (Co-Authors M. Joborn, T.G. Crainic, M. Gendreau and J.T. Lundgren.) CRT-2002-48. Centre for Research on Transportation, Université de Montréal, Canada.

2001 Economies of Scale in Empty Freight Car Distribution in Scheduled Railways. (Co-Authors T.G. Crainic, M. Gendreau, M. Joborn and J.T. Lundgren.) CRT-2001-12. Centre for Research on Transportation, Université de Montréal, Canada.

2001 Bicriteria Network Location (BNL) Problems with Criteria Dependent Lengths and Minisum Objectives (Co-Authors K.A. Andersen and A.J.V. Skriver.) Research Report LiTH-MAT-R-2001-10. ◇

2001 Optimization of Internet Protocol Network Design and Routing. (Co-Author D. Yuan.) Research Report LiTH-MAT-R-2001-07. ◇

2000 Economies of Scale in Empty Freight Car Distribution in Scheduled Railways. (Co-Authors T.G. Crainic, M. Gendreau, M. Joborn and J.T. Lundgren.) Research Report LiTH-MAT-R-00-23. ◇

1998 Network Optimization within the Telecommunication Area: A Literature Survey. (Co-Author D. Yuan.) Working Paper LiTH-MAT/OPT-WP-98-01. ◇

1998 A Capacitated Bus Grid Network Design Problem. (Co-Authors M. Henningsson and M. Domander (previously Näsberg).) Research Report LiTH-MAT-R-98-10. ◇

1998 Cost-Efficient Bandwidth Expansion of a Cable TV Network for Interactive Broadband Services. (Co-Authors M. Henningsson, M. Näsberg and D. Yuan.) Working Paper LiTH-MAT/OPT-WP-98-02. ◇

1998 A Ring Network Design Problem. (Co-Authors M. Henningsson, M. Rönnqvist and P. Värbrand.) Working Paper LiTH-MAT/OPT-WP-98-03. ◇

1998 A Multicommodity Network Flow Problem with Side Constraints on Paths Solved by Column Generation. (Co-Author D. Yuan.) Research Report LiTH-MAT-R-98-05. ◇

1997 A Lagrangean Approach to Network Design Problems. (Co-Author D. Yuan.) Research Report LiTH-MAT-R-98-01. ◇

1997 Solving Capacitated Facility Location Problems with Single Sourcing Using Lagrangean Heuristics, Repeated Matching and Branch-and-Bound. (Co-Authors M. Rönnqvist and D. Yuan.) Research Report LiTH-MAT-R-97-05. ◇

1996 Creative Modeling: Variable and Constraint Duplication in Primal-Dual Decomposition Methods. Research Report LiTH-MAT-R-97-08. ◇

1996 A Model for Dimensioning of Transportation Capacities in a Railway Network. (Co-Authors P. Flisberg, M. Joborn and J.T. Lundgren.) Research Report LiTH-MAT-R-96-27. ◇

1996 A Lagrangean Heuristic Based Branch-and-Bound Approach for the Capacitated Network Design Problem. (Co-Author D. Yuan.) Research Report LiTH-MAT-R-96-23. ◇

1996 A Model for Distribution of Empty Freight Cars. (Co-Authors M. Joborn and J.T. Lundgren.) Research Report LiTH-MAT-R-96-11. ◇

1996 Exact Solution Methods for Uncapacitated Location Problems with Convex Transportation Costs. Research Report LiTH-MAT-R-96-10. ◇

1995 A Lagrangean Heuristic for the Facility Location Problem with Staircase Costs. (Co-Author J. Ling.) Research Report LiTH-MAT-R-95-24. ◇

1995 Lagrangean Heuristics for Linear Cost Multicommodity Network Flow Problems. Working Paper LiTH-MAT/OPT-WP-95-01. ◇

1995 Decomposition Methods for the Exact Formulation of the Simple Plant Location Problem with Spatial Interaction. (Co-Author K. Jörnsten.) Research Report LiTH-MAT-R-95-13. ◇

1995 Experiments with Primal-Dual Decomposition and Subgradient Methods for the Uncapacitated Facility Location Problem. Research Report LiTH-MAT-R-95-08. ◇

1994 Dual Search Procedures for the Exact Formulation of the Simple Plant Location Problem with Spatial Interaction. (Co-Author K. Jörnsten.) Research Report LiTH-MAT-R-94-38. ◇

1994 A Dual Ascent Procedure for the Exact Formulation of the Simple Plant Location Problem with Spatial Interaction. (Co-Author K. Jörnsten.) Research Report LiTH-MAT-R-94-31. ◇

1994 Solving the Uncapacitated Network Design Problem by a Lagrangean Heuristic and Branch-and-Bound. (Co-Author J. Hellstrand.) Research Report LiTH-MAT-R-94-11. ◇

1994 A Lagrangean Heuristic Applied to the Uncapacitated Network Design Problem. (Co-Author J. Hellstrand.) Working Paper LiTH-MAT/OPT-WP-94-01. ◇

1994 A Simple Modification of Dantzig-Wolfe Decomposition. (Co-Author K. Jörnsten.) Research Report LiTH-MAT-R-94-04. ◇

1994 Primal and Dual Decomposition as Organizational Design: Price and/or Resource Directive Decomposition. Research Report LiTH-MAT-R-94-03. ◇

1993 A Production-Transportation Problem with Stochastic Demand and Concave Production Costs. (Co-Author Hoang Tuy.) Research Report LiTH-MAT-R-93-30. ◇

1993 Computational Tests of Decomposition and Linearization Methods for the Stochastic Transportation Problem. Working Paper LiTH-MAT/OPT-WP-93-01. ◇

1993 Solving the Generalized Knapsack Problem with Variable Coefficients. (Co-Author K. Jörnsten.) Research Report LiTH-MAT-R-1993-19. ◇

1993 Efficient Decomposition and Linearization Methods for the Stochastic Transportation Problem. Research Report LiTH-MAT-R-1993-10. ◇

1991 Nonlinear Mean Value Cross Decomposition: The Strictly Convex Case. Working Paper LiTH-MAT/OPT-WP-91-15. ◇

1991 On Using Approximations of the Benders Master Problem. Working Paper LiTH-MAT/OPT-WP-91-12. ◇

1991 Applying Mean Value Cross Decomposition and Other Primal-Dual Solution Methods to the Uncapacitated Facility Location Problem. Working Paper LiTH-MAT/OPT-WP-91-11. ◇

1991 Decomposition Methods for the Exact Formulation of the Simple Plant Location Problem with Spatial Interaction. (Co-Author K. Jörnsten.) Working Paper LiTH-MAT/OPT-WP-91-10. ◇

1991 The Exact Formulation of the Simple Plant Location Problem with Spatial Interaction and its Solution. (Co-Author K. Jörnsten.) Working Paper LiTH-MAT/OPT-WP-91-09. ◇

1991 Solution Methods for the Discrete Choice Network Design Problem Combining Lagrangean Relaxation and Decomposition with Generation of Valid Inequalitites. (Co-Author A. Migdalas.) Working Paper LiTH-MAT/OPT-WP-91-07. ◇

1991 Variable and Constraint Duplication Techniques in Primal-Dual Decomposition Methods. Research Report LiTH-MAT-R-1991-23. ◇

1991 Solving the Staircase Cost Facility Location Problem with Decomposition and Piecewise Linearization. Research Report LiTH-MAT-R-1991-20. ◇

1991 Linearizations of the Staircase Cost Facility Location Problem. Research Report LiTH-MAT-R-1991-19. ◇

1991 Mean Value Cross Decomposition Applied to Integer Programming Problems. Research Report LiTH-MAT-R-1991-18. ◇

1991 Generalized Cross Decomposition Applied to Nonlinear Integer Programming Problems: Duality Gaps and Convexification in Parts. Research Report LiTH-MAT-R-1991-13. ◇

1990 Cross Decomposition Applied to Integer Programming Problems: Duality Gaps and Convexification in Parts. Research Report LiTH-MAT-R-90-34. ◇

1990 Benders Decomposition Using Approximations of the Master Problem Compared to Cross Decomposition. Research Report no: 90/14, Operations Research, Department of Mathematics, Aarhus University, Denmark.

1990 A Convergence Proof for Linear Mean Value Cross Decomposition. Research Report no: 90/12, Operations Research, Department of Mathematics, Aarhus University, Denmark. Revised version: Research Report LiTH-MAT-R-91-09. ◇

1990 Linear Mean Value Cross Decomposition: A Generalization of the Kornai-Liptak Method. Research report no: 90/1, Operations Research, Department of Mathematics, Aarhus University, Denmark. Revised version: Research Report LiTH-MAT-R-90-39. ◇

1989 On the Use of Valid Inequalities in Benders and Cross Decomposition. Research Report LiTH-MAT-R-89-21. (Revised jan. -95.) ◇

1989 Computational Experiments with Primal-Dual Solution Methods for the Produce-or-Purchase Problem. Research Report LiTH-MAT-R-89-20. ◇

1989 Solution Methods for Staircase Cost Problems Based on Convex Piecewise Linearization, Benders Decomposition, Lagrangean Relaxation and Cross Decomposition. Research Report LiTH-MAT-R-89-15. ◇

1989 Combining Cross Decomposition with the Approach of Kornai and Liptak. Working Paper LiTH-MAT/OPT-WP-89-06. ◇

1989 Cross Decomposition and Lagrangean Relaxation of the Benders Master Problem. Research Report LiTH-MAT-R-89-14. ◇

1989 Transportation and Location Problems with Staircase Costs. Research Report LiTH-MAT-R-89-12. ◇

1989 A Note on Lagrangean Relaxation of the Benders Master Problem. Research Report LiTH-MAT-R-89-04. ◇

1988 Generalized Cross Decomposition with Variable and Constraint Duplication Techniques. Research Report LiTH-MAT-R-88-17. ◇

1988 Primal-Dual Subgradient Optimization and Cross Decomposition with Applications to the Produce-or-Purchase Problem. Research Report LiTH-MAT-R-88-16. ◇

1988 Generalized Cross Decomposition Applied to the Stochastic Transportation-Location Problem. Research Report LiTH-MAT-R-88-15. ◇

1987 On the Solving of Large Transportation Problems. Working Paper LiTH-MAT/OPT-WP-87-07. ◇

1986 On the Convergence of Cross Decomposition. Research Report LiTH-MAT-R-86-17, revised 1988. ◇

1986 Decomposition Methods Applied to Discrete Network Design. (Co-Authors K. Jörnsten and A. Migdalas). Working Paper LiTH-MAT/OPT-WP-86-07. ◇

1984 Dual Search Procedures for Trip Distribution Estimation. (Co-Author K. Jörnsten.) Research Report LiTH-MAT-R-84-27. ◇

1984 Capacitated Facility Location with Staircase Costs. Research Report LiTH-MAT-R-84-26. ◇

1984 Decomposition Methods for Relaxed Gravity Models. (Co-Author K. Jörnsten.) Research Report LiTH-MAT-R-84-23. ◇

1984 Exact Methods for Gravity Trip Distribution Models. (Co-Author K. Jörnsten.) Research Report LiTH-MAT-R-84-19. ◇

1984 Basic Decomposition Principles. Research Report LiTH-MAT-R-84-17. ◇

1984 Separable Programming Applied to the Stochastic Transportation Problem. Research Report LiTH-MAT-R-84-15. ◇

1984 A Useful Tool for Analysing and Planning Goods Transportation. Research Report LiTH-MAT-R-84-09. ◇

1984 Facility Location with Staircase Costs. Research Report LiTH-MAT-R-84-05. ◇

1984 Cross Decomposition Applied to a Mathematical Programming Model for Distribution Planning of Crude Oil and Petroleum Products in China. (Co-Authors X.Gui and K. Jörnsten.) Research Report LiTH-MAT-R-84-01. ◇

1983 A Mathematical Programming Model for Furniture Transportation Planning. (Co-Author K. Jörnsten.) Working Paper (in Swedish). ◇

1982 Cross Decomposition Applied to the Stochastic Transportation Problem. (Co-Author K. Jörnsten.) Research Report LiTH-MAT-R-82-22. ◇

Teaching Experience:
At least three courses each year since 1980, ranging from lectures for 180 students to small advanced groups:
Linear Programming, Nonlinear Programming, Integer Programming, Combinatorial optimization, graph theory, network optimization, mathematical models, decomposition methods, Lagrangean methods, etc.

Nominated to "Gyllene Moroten", a price for excellence in teaching, spring 2005, for the course Combinatorial Optimization.
Recent top scores in student evalations (in a 5 grade scale):
TAOP86 2014 grade 4.62, 38% answering.
TAOP86 2016 grade 4.8, 35% answering.
TAOP88 autumn 2014 grade 4.43, 44% answering.
TAOP88 autumn 2015 grade 4.32, 31% answering.
TAOP61 2015 grade 4.5, 37% answering.

Courses:
Algorithms and Optimization, D2.
Algorithms and Optimization, IT2.
Combinatorial Optimization, Introductory Course, D2, C3.
Combinatorial Optimization with Environmental Applications, IT3.
Decomposition and Search Methods for Large Scale Optimization, Denmark.
Discrete Optimization, Y4.
Engineering Optimization, EMM2, M3, TB3, KB3.
Introduction to Operations Research, I2.
Introduction to Operations Research, TB2.
Introduction to Optimization, Y2.
Linear and Nonlinear Optimization, Mat.
Linear and Nonlinear Optimization, Y3.
Mathematical Programming, Y4, I4.
Mathematical Programming, Denmark.

Mathematics 22, Denmark.
Optimization 1, Mat.
Optimization 2, Mat.
Optimization in Communication Networks, Y4.
Optimization of Realistic Complex Systems, EMM4.
Optimization of Technical Systems, Y4, Mat. Operations Research, M3.
Operations Research, Extended Course, I3.
Primal and Dual Decomposition Methods, PhD course.
Project - Applied Mathematics, Y4.
Supply Chain Optimization, I4, master.

(I have developed six of these courses from scratch, including literature, and significantly improved several of the others.)

Text Books and Other Material:

Introduction to Mathematical Decomposition Methods for Structured Optimization Models. (In Swedish.) LiU, 2015.
Optimization. (In Swedish.) Liber, 2010.
Combinatorial Optimization with Linear Programming. (In Swedish.) LiU, 2002-09.
Primal and Dual Decomposition Methods and Search Methods. LiU, 1990-95, 2001-02.
Combinatorial Optimization II. (In Swedish.) LiU, 1988-89.
Integer Programming and Dynamic Programming. (In Swedish.) LiU, 1988-90.
Network Flows and Combinatorial Optimization. (In Swedish.) LiU, 1987-90.
Newsletter of the Nordic Section of the Mathematical Programming Society, no. 1, 2, 3, 4. (Editor.) 1994, 1995, 1996, 1997.

Software:

Sole developer of the following codes, used for research and teaching:
VINEOPT: Graphical code for network flow problems, shortest path problems, spanning tree problems, traveling salesman problems, postman problems.
VILEOPT: Interactive code for solving linear optimization problems.
NILEOPT: Interactive, graphical code for solving nonlinear optimization problems, including steepest decsent, conjugate gradient and quasi-Newton methods.
VIKEOPT: Interactive code for solving of the k-chinese postman problem.
VIGROPT: Interactive code for formation of student groups (used for Problem Based Learning).

Presentations: (63 items)

2017 Another look at snow removal. VeRoLog 2017, Amsterdamn, The Netherlands.

2016 The (Over) Zealous Snow Remover Problem. EURO 2016, Poznan, Poland.

2015 Optimization of urban snow removal with the help of a weighted k-Chinese/rural postman problem. SOAK 2015, Västerås, Sweden.

2015 Heuristics for the weighted k-Chinese/rural postman problem (with a hint of fixed costs) with applications to urban snow removal. EURO 2015, Glasgow, UK.

2014 Map matching and route optimization. IFORS 2014, Barcelona, Spain.

2013 Planning and routing in urban networks. EURO/INFORMS MMXIII (2013), Rome, Italy.

2012 Planning and routing in networks: Urban snow removal. 21st International Symposium on Mathematical Programming (ISMP 2012), Berlin, Germany.

2012 Optimization, an introduction, Tutorial, MODPROB 2012, Linköping, Sweden.

2011 What is optimal? (In swedish.) Popular science at Linköping University. Filmed by UR, SVT, broadcasted at Kunskapskanalen (Swedish television) 111124 and 120103.

2010 Urban Snow Removal. 4th Nordic Optimization Symposium, Aarhus, Denmark.

2009 Valid Inequalities from Valid Cycles: Designing SP-Graphs for OSPF Routing. Third Nordic Optimization Symposium, Stockholm, Sweden.

2007 Optimization Approaches for Routing in Switching Networks of Clos Type. Second Nordic Optimization Symposium, Oslo, Norway.

2007 Infeasible inverse shortest path problems à la OSPF. Mathematical Programming and Economics Workshop on the occasion of the retirement of Professor Jørgen Tind, Copenhagen, Denmark.

2005 Determining the Non-Existence of a Compatible OSPF Metric. INOC 2005, International Network Optimization Conference, Lisbon, Portugal.

2005 Why can certain routing patterns not be obtained by OSPF? Department of Communication Systems, Lund University, Sweden.

2004 Stronger Necessary Conditions for the Existence of a Compatible OSPF Metric. Nordic MPS'04, Norrköping, Sweden.

2003 Mean Value Cross Decomposition for Nonlinear Convex Problems. 18th International Symposium on Mathematical Programming, Copenhagen, Denmark.

2002 Parallel Mean Value Cross Decomposition for Nonlinear Convex Problems. Nordic MPS'02, Bergen, Norway.

2001 Optimization of Internet Protocol Network Design and Routing. Nordic MPS'01, Copenhagen, Denmark.

2001 Optimization of Internet Protocol Network Design and Routing. EURO 2001, Rotterdam, The Netherlands.

2000 Exact Solution of the Uncapacitated Facility Location Problem with Convex Transportation Costs. 17th International Symposium on Mathematical Programming, Atlanta, USA.

2000 Ring Generation by Lagrangean Based Column Generation. Fifth INFORMS Telecommunications Conference, Boca Raton, USA.

2000 A Capacitated Bus Grid Network Design Problem. 8th International Conference on Telecommunications Systems, Nashville, USA.

1999 On Proving Convergence of the Mean Mean Value Cross Decomposition Method. Nordic MPS'99, 6th Meeting of the Nordic Section of the MPS, Västerås, Sweden.

1998 A Ring Network Design Problem. OR98, International Conference on Operations Research, Zürich, Switzerland.

1998 Mean Value Cross Decomposition Based Branch-and-Bound for Mixed Integer Programming Problems. OR98, International Conference on Operations Research, Zürich, Switzerland.

1998 A Ring Network Design Problem. ECCO-XI, European Chapter on Combinatorial Optimization, Copenhagen, Denmark.

1998 Mean Value Cross Decomposition Based Branch-and-Bound for Mixed Integer Programming Problems. Nordic MPS'98, 5th Meeting of the Nordic Section of the MPS, Molde, Norway.

1998 A Ring Network Design Problem. CO98, International Symposium on Combinatorial Optimization, Brussels, Belgium.

1998 A Ring Network Design Problem. Workshop on Combinatorial Optimization, Copenhagen, Denmark.

1997 Mean Value Cross Decomposition Based Branch-and-Bound for Mixed Integer Programming Problems. 16th International Symposium on Mathematical Programming, Lausanne, Switzerland.

1997 Lagrangean Heuristic Based Solution Methods for Capacitated Network Design Problems with Different Characteristics. 16th International Symposium on Mathematical Programming, Lausanne, Switzerland.

1997 Mean Value Cross Decomposition Based Branch-and-Bound for Mixed Integer Programming Problems. From Local to Global Optimization, A Workshop on the Occasion of the 70th Birthday of Professor Hoang Tuy, Linköping, Sweden.

1997 A Lagrangean Heuristic Based Solution Method for the Survivable Capacitated Network Design Problem with Staircase Costs. IFORS SPC-7: Information Systems in Logistics and Transportation, Gothenburg, Sweden.

1996 Lagrangean Based Solution Methods for the Capacitated Network Design Problem. Symposium über Operations Research (SOR'96), Braunschweig, Germany.

1996 Solving the Capacitated Facility Location Problem with Single Sourcing. Fourth Nordic MPS meeting, Århus, Denmark.

1995 Solution Methods for the Simple Plant Location Problem with Spatial Interaction Formulated as a Linear Integer Programming Problem. Symposium über Operations Research (SOR'95), Passau, Germany.

1995 A Heuristic Approach for Facility Location with Staircase Costs. Symposium über Operations Research (SOR'95), Passau, Germany.

1995 Solution Methods for the Exact Formulation of the Simple Plant Location Problem with Spatial Interaction. Optimization '95, Braga, Portugal.

1994 Solving the Discrete Network Design Problem to Optimality. 15th Int. Symposium on Mathematical Programming, Ann Arbor, Mich., USA.

1994 Solving the Uncapacitated Network Design Problem by a Lagrangean Heuristic and Branch-and-Bound. CO94, Amsterdam, the Netherlands.

1994 Primal and Dual Decomposition as Organizational Design: Price and/or Resource Directive Decomposition. (Invited.) Workshop on Mathematical Models of Organizational Design, Brussels, Belgium.

1994 Efficient Decomposition and Linearization Methods for the Stochastic Transportation Problem. Third Nordic MPS meeting, Linköping, Sweden.

1993 A Production-Transportation Problem with Stochastic Demand and Concave Production Costs. 18. Symposium über Operations Research, Cologne, Germany.

1993 Efficient Decomposition and Linearization Methods for the Stochastic Transportation Problem. 4th Stockholm Optimization Days, Stockholm, Sweden.

1992 Solving the Uncapacitated Network Design Problem with Lagrangean Relaxation, Subgradient Optimization and Branch-and-bound. Second Nordic MPS meeting, Trondheim, Norway.

1992 A Dual Ascent Procedure for Simple Plant Location with Spatial Interaction. (Invited.) EURO XII / TIMS XXXI, Helsinki, Finland.

1991 Bounds for pure integer programming problems obtainable by primal-dual decomposition methods. (Invited.) 14th Int. Symposium on Mathematical Programming, Amsterdam, Holland.

1991 (Invited to arrange a session.) Session: Decomposition Methods in Mathematical Programming. Presentation: Mean Value Cross Decomposition. EURO XI, Aachen, Germany.

1990 Mean Value Cross Decomposition. First Nordic MPS Meeting, Copenhagen, Denmark.

1989 Approximate Ways of Solving the Benders Master Problem in Benders and Cross Decomposition. CO89, Leeds, England.

1989 Transportation and Location Problem with Staircase costs: Models and Solution Methods. EURO Working Group on Locational Analysis, Chios, Greece.

1989 Modifications of Cross Decomposition. EURO X, Belgrade, Jugoslavia.

1989 A Swedish System for Interactive Network Optimization. NOAS'89: Decision Support Systems, Linköping, Sweden.

1989 Approximate Ways of Solving the Benders Master Problem in Benders and Cross Decomposition. NOAS'89: Decision Support Systems, Linköping, Sweden.

1988 Generalized Cross Decomposition and Variations. 13th Int. Symposium on Mathematical Programming, Tokyo, Japan.

1987 Transportation and Location Problems with Staircase Costs. NOAS'87: OR in Transportation, Copenhagen, Denmark.

1986 Solving the Discrete Network Design Problem by Combining Lagrangean Relaxation, Decomposition and Constraint Generation. EURO VIII, Lissabon, Portugal.

1985 Decomposition Methods Applied to Discrete Network Design. 12th Int. Symposium on Mathematical Programming, Cambridge, Mass., USA.

1984 Exact Methods for Gravity Trip Distribution Models. 9. Symposium über Operations Research, Osnabrück, West Germany.

1984 Capacitated Facility Location with Staircase Costs. First EURO Summer Institute, Brussels, Belgium.

1984 Some Applications of Decomposition Techniques to Gravity Models. TIMS XXVI International Congress, Copenhagen, Denmark.

1982 A Cross Decomposition Method for the Stochastic Transportation Problem. XI Int. Symposium on Mathematical Programming, Bonn, West Germany.

Organization of International Conferences:

2003 Member of the Program Committee for INOC2003 - International Network Optimization Conference, 2003 Evry/Paris, France.

2003 Member of the Nordic Committee of ISMP 2003, the 18th International Symposium on Mathematical Programming, Copenhagen, Denmark.

1994 Main organizer of the Third Meeting of the Nordic Section of the Mathematical Programming Society, Linköping, Sweden.

Administrative Activities:

2013- Coordinator of Studies in the 5th Semester, Information Technology Programme, Department of Mathematics, Linköping Institute of Technology, Sweden.

2010-2011 Head of IT at the Department of Mathematics, Linköping Institute of Technology, Sweden.

2009-2011 Deputy Head of Department, Department of Mathematics, Linköping Institute of Technology, Sweden.

2009-2012 Coordinator of Studies in the 6th Semester, Information Technology Programme, Department of Mathematics, Linköping Institute of Technology, Sweden.

2009-2011 Deputy Member of the Board of Undergraduate Studies for Mechanics and Design, Linköping Institute of Technology, Sweden.

2005- Head of the Division of Optimization, Department of Mathematics, Linköping Institute of Technology, Sweden.

2001-2006 Member of the Board of Undergraduate Studies for Mathematics and Natural Science, Linköping Institute of Technology, Sweden.

2001 (Mar-Jun) Head of Department, Department of Mathematics, Linköping Institute of Technology, Sweden.

2000-2001 Deputy Head of Department, Department of Mathematics, Linköping Institute of Technology, Sweden.

1995-2002 Director of Graduate Studies, Department of Mathematics, Linköping Institute of Technology, Sweden.

1994-2002 Chairman of the Nordic Section of the Mathematical Programming Society.

1993-1999 Deputy member of "Forsknings- och forskarutbildningsnämnden" (Research and Graduate Education Board), Linköping Institute of Technology, Sweden.

1993-2000 Member of "Forskarutbildningskommittén" (Graduate Education Committee), Linköping Institute of Technology, Sweden.

1990-92,1993-2002 Member of the Board of the Nordic Section of the MPS (Mathematical Programming Society).

1982-84,1993-96 Member of the Board of the Department of Mathematics, Linköping Institute of Technology, Sweden.

Research Grants: (16 items)

2016-2019 Route Optimization using digital map data and GPS data. The Swedish Research Council (VR).

2010-2013 Efficient Traceable Model-Based Dynamic Optimization (Co-applicant.) ProViking.

2010-2011 Effect Oriented Planning of Dynamic Scenarios. Vinnova.

2007-2009 Directing, Controlling and Modeling IP Network Traffic. The Swedish Research Council (VR).

2004-2006 Design of survivable communication networks with distributed routing. The Swedish Research Council (VR).

2003 Optimal Design of Communication Networks Using Internet Protocol. Linköping Institute of Technology.

1999-2001 Development of Infrastructure in Telecommunications. Swedish Communication Research Board (KFB), The National Board for Industrial and Technical Development (NUTEK) and Telia AB.

1994-98 Optimization Models and Methods within the Area of Telecommunications. Swedish Communication Research Board (KFB), The National Board for Industrial and Technical Development (NUTEK), Telia AB and Ericsson Telecom AB.

1994-96 Mathematical decomposition methods for structured optimization problems. Linköping Institute of Technology.

1994-96 Solution Methods for Structured Large Scale Optimization Models. Swedish Research Council for Engineering Sciences (TFR).

1993-94 Quasi- and pseudo-convexity in mathematical programming. Linköping Institute of Technology.

1992 Solution Methods for Structured Large Scale Optimization Models. (Co-applicant.) TFR (Swedish Technical Science Research Council).

1988-90 Improved Decomposition Methods for Structured Optimization Problems. NFR (Swedish Natural Science Research Council).

1986-87 Location and Transportation Planning and Cost Structures in Transportation Networks. TFB (Swedish Transport Research Board).

1985-86 Optimization of Transportation Planning on Personal Computer. TFB (Swedish Transport Research Board).

1985-88 Mathematical Programming as an instrument for modeling. Models and methods based on the principles optimality, stability and efficiency. (Co-applicant.) STU (Swedish Board for Technical Development).

Supervisor for PhD-students:

Roghayeh Hajizadeh: Arc routing and snow removal with digital maps and GPS. Ongoing.

William Lövfors: System Biology. Co-supervisor. Ongoing.

Emil Karlsson: Scheduling of Avionic Systems. Ongoing.

Per-Magnus Olsson: Methods for Network Optimization and Parallel Derivative-free Optimization. Linköping Studies in Science and Technology. Dissertation no. 1580 (2014).

Kristian Lundberg: Licenciate Thesis: Effect Oriented Planning in Military Mission Support Systems. Thesis no. 1544 (2013).

Nils-Hassan Quttineh: Models and Methods for Costly Global Optimization and Military Decision Support Systems. Linköping Studies in Science and Technology. Dissertation no. 1450 (2012).

Mikael Call: Shortest Path Routing Modelling, Infeasibility and Polyhedra. Linköping Studies in Science and Technology. Dissertation no. 1486 (2012).
Licenciate Thesis: Inverse Shortest Path Routing Problems in the Design of IP Networks. Linköping Studies in Science and Technology. Thesis no. 1448 (2010).

Peter Broström: Optimization Models and methods for Telecommunication Networks using OSPF. Linköping Studies in Science and Technology. Dissertation no. 1032 (2006).
Licenciate Thesis: Optimization in the Design of OSPF Telecommunication Networks. Linköping Studies in Science and Technology. Thesis no. 1102 (2004).

Mathias Henningsson: Ring Network Design in Telecommunications: Optimization Based Solution Approaches. Linköping Studies in Science and Technology. Dissertation no. 829 (2003).
Licenciate Thesis: Some Optimization Models in the Area of Telecommunications, LiU-TEK-LIC-1998:43.

Kennet Melin: Licenciate Thesis: Optimization Modelling and Methods for Freight Transportation in Scheduled Railways, LiU-TEK-LIC-2002:22.

Di Yuan: Optimization Models and Methods for Communication Network Design and Routing. Linköping Studies in Science and Technology. Dissertation no. 682 (2001).
Licenciate Thesis: Optimal Synthesis and Multicommodity Routing in Telecommunication Networks, LiU-TEK-LIC-1997:65.

Martin Joborn: Optimization of Empty Freight Car Distribution in Scheduled Railways. Linköping Studies in Science and Technology. Dissertation no. 671 (2001).
Licenciate Thesis: Empty Freight Car Distribution at Swedish Railways - Analysis and Optimization Modeling, LiU-TEK-LIC-1995:31.

Candidate Thesis Supervision: (2 items)

2011 Anna Borggren: Heuristic search methods for the optimal ingraph. LiTH-MAT-EX–2011/20–SE.

2010 Björn Morén: Non-trivial shortest path routing conflicts - Classification and search methods. LiTH-MAT-EX–2010/19–SE.

Master Thesis Supervision: (12 items)

2015 Andreas Lindblad: Routing of traffic in an IP-network using combined routing patterns. LiTH-MAT-EX-2015/06-SE.

2010 Richard Sandberg: A survey of optimization methods for solving the inverse shortest path routing problem, LiTH-MAT-EX–2010/26–SE.

2008 Johan Torstensson: Computation of Mileage Limits for Traveling Salesmen by Means of Optimization Techniques. LiTH-MAT-EX–2008/08–SE.

2008 Erik Haraldsson: Combining Unobtainable Shortest Path Graphs for OSPF. LiTH-MAT-EX–2008/07–SE.

2005 Roeya Elyasi Pour and Hooshang Farhadi: The Rural Postman Problem. LiTH-MAT-EX–05/17–SE.

1997 Anders Lindqvist: Association of Image Data During Reconstruction of Multiple Targets in Three Dimensions. LiTH-MAI-EX-1997-06.

1996 Lena Wedemalm: An Optimization Model for Minimization of the Costs in "Sjöfartsverkets" DGPS. LiTH-MAT-EX-96-06.

1996 Di Yuan: An Application of Lagrangean Heuristics and Branch-and-Bound on the Capacitated Network Design Problem. LiTH-MAT-Ex-96-05.

1994 Fredrik Åhlander: Relaxation Methods for the Capacitated Location Problem with Single Sourcing. LiU-MAT-EX-94-07.

1994 Anders Nilson: The Capacitated Facility Location Problem with Single Sourcing. A Comparison of Branch-and-bound and Benders decomposition. LiU-MAT-C–94/04–SE.

1993 Patrik Hägglund and Magnus Edengren: Implementation of two Optimization Algorithms for FANGA Analysis: A Method for Improvement of CAD Surfaces. LiU-MAT-EX-93-11.

1992 Anders Uppman: An Efficient Dual Method for the Facility Location Problem with Spatial Interaction. LiU-MAT-EX-92-03.

1987 Elisabeth Andersson: Investment in Road Capacity Between a Suburb and City. LiU-MAT-EX-87-65.

1987 George Bastay, Johan Hellstrand and Bengt-Ove Turesson: A Comparison Between Decomposition Methods for the Discrete Network Design Problem. LiU-MAT-EX-87-62.

PhD and Licenciate Committees: (20 items) (All PhD, except one.)

2013 Mengjie Han: Heuristic Optimization of the p-median Problem and Population Redistribution. School of Technology and Business Studies, Dalarna University, Sweden.

2013 Tue R.L. Christensen: Network Design Problems with Piecewise Linear Cost Functions. School of Business and Social Sciences, Aarhus Univeristy, Denmark.

2011 Mikael Fallgren: Optimization of Joint Cell, Channel and Power Allocation in Wireless Communication Networks. Department of Mathematics, Royal Institute of Technology, Sweden.

2011 Peter Lindroth: Product Configuration from a Mathematical Optimization Perspective. Department of Mathematical Sciences, Chalmers University of Technology, Sweden. Opponent.

2009 Fredrik Kuivinen: Algorithms and Hardness Results for Some Valued CSPs. Department of Computer and Information Science, Linköping Institute of Technology, Sweden.

2008 Mats Werme: On Methods for Discrete Topology Optimization of Continuum Structures. Department of Mathematics, Royal Institute of Technology, Sweden.

2008 Anders Eriksson: Optimization Methods for Large Scale Combinatorial Problems and Bijectivity Constrained Image Deformations. Centre for Mathematical Sciences, Lund University, Sweden.

2006 Christina Grönwall: Ground Object Recognition using Laser Radar Data - Geometric Fitting, Performance Analysis, and Applications. Department of Electrical Engineering, Linköping Institute of Technology, Sweden.

2006 Jon Edvardsson: Techniques for Automatic Generation of Tests from Programs and Specifications. Department of Computer and Information Science, Linköping Institute of Technology, Sweden.

2006 Pål Nilsson: Fairness in Communication and Computer Network Design. Department of Communication Systems, Lund University, Sweden.

2006 Wilhelm Cronholm: Decomposition Methods for Multicast Network Design. University of London, Imperial College, London, UK. Examiner.

2005 Eligijus Kubilinskas: Designing Resilient and Fair Multi-layer Telecommunication Networks. (Licenciate.) Department of Communication Systems, Lund University, Sweden.

2005 Ragnar Wallin: Optimization Algorithms for System Analysis and Identification. Department of Electrical Engineering, Linköping Institute of Technology, Sweden.

2004 Truls Flatberg: Majorization and optimization related to graphs and (0,1)-matrices. Faculty of Mathematics and Natural Sciences, Oslo University, Norway. First Opponent.

2004 Njål Foldnes: Polyhedra and Algorithms for some Knapsack Problems and Hop-constrained Paths. Faculty of Mathematics and Natural Sciences, Oslo University, Norway. Second Opponent.

2002 Thomas Stidsen: Optimization Problems in Optical Network Design. Institute of Mathematical Modelling, Technical University of Denmark, Denmark.

2002 Mikael Prytz: On Optimization in Design of Telecommunications Networks with Multicast and Unicast Traffic. Department of Mathematics, Royal Institute of Technology, Sweden.

1998 Anne De Jongh: Uncapacitated Network Design and Bifurcated Routing. Institut de Statistiques et de Recherche Opérationnelle, Service de Mathématiques de la Gestion, Université Libre Bruxelles, Belgium.

1993 Ulf Brännlund: On Relaxation Methods for Non-smooth Convex Optimization. Department of Mathematics, Royal Institute of Technology, Sweden.

1992 Huiping Ding: Theory of Initial Order Quantities - A Dynamic Sequence of Economic Order Quantities. Department of Production Economics, Linköping Institute of Technology, Sweden.

Docent Committees ("Docenturnämnd"):

2015 Clas Rydergren, ITN, Linköping University.
2015 Emil Björnsson, ISY, Linköping University.
2014 Daniel Nordigården, IEI, Linköping University.
2013 Helene Lidestam, IEI, Linköping University.
2013 Patrik Thollander, IEI, Linköping University.
2012 Maria Björklund, IEI, Linköping University.
2011 Christian Kowalkowski, IEI, Linköping University.
2011 Johan Löfberg, ISY, Linköping University.
2010 Fredrik Persson, IEI, Linköping University.

2009 Fredrik Nilsson, IEI, Linköping University.
2003 Nancy Reed, IDA, Linköping University.
2000 Lars-Göran Lindberg, IMT, Linköping University.
2000 Mats Fahlman, IFM, Linköping University.
1999 Göran Bergqvist, MAI, Linköping University.

Other Committees ("Anställningsnämnder"):

2011 Senior Lecturer in Mathematics with Specialization in Optmization and Logistics, Department of Mathematics and Mathematical Statistics, Umeå University, Sweden.

2005 Lecturer in Operations Research, Department of Mathematics, Copenhagen University, Denmark.

2000 Associate/Assistant Professor in Operational Research, Department of Mathematical Modelling, Denmark's Technical University (DTU).

2000 Professor in Quantitative Logistics ("Kvantitativ logistik"), Høgskolen i Molde, Norway.

2000 Professor in Informatics ("Informatik"), Høgskolen i Molde, Norway.

Paper Refereeing:

BIT.
Computational Optimization and Applications.
Computers & Operations Research.
Discrete Applied Mathematics.
European Journal of Operational Research.
EURO Journal on Computational Optimization.
Engineering Costs and Production Economics.
IEEE Transactions on Robotics and Automation.
Information Processing Letters.
INFORMS Journal on Computing.
International Journal of Production Economics.
International Transactions in Operational Research.
Journal of Global Optimization.
Management Science.
Mathematical and Computer Modelling of Dynamical Systems.
Mathematical Programming.
Mathematical Programming Study.
Naval Research Logistics.
Operations Research.
Operations Research Letters.
Optimization Methods and Software.
Proceedings of the International Working Seminars on Production Economics.
SIAM Journal of Control and Optimization.
Telecommunication Systems.
Transportation Research.
Transportation Science.

Book Reviewing:

European Journal of Operational Research.
Optima.

Consultant for Business and Industrial Firms:

FFV (Förenade FabriksVerken), Arboga, Sweden.
Goman, KF, Stockholm, Sweden.
IKEA, Werne an der Lippe, Germany.
Linköpings kommun, Sweden.
SJ (Statens Järnvägar), Stockholm, Sweden.
Skogshögskolan, Garpenberg, Sweden.
Stora, Borlänge, Sweden.

Summary 2017-09-01:

43 publications in international journals
29 publications in conference proceedings
10 papers/chapters in books
101 research reports
63 conference presentations