

CURRICULUM VITAE



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PERSONAL DATA

- Date and place of birth: June 4th, 1971, Liperi, Finland.
- Place of residence: Turku, Finland.
- Nationality: Finnish.
- Gender: Female.
- Marital status: Married (maiden name Haarala).

EDUCATION

- Adjunct Professor in Applied Mathematics, 2011. University of Turku, Finland.
- Doctor of Philosophy (Scientific Computing), 2004. Department of Mathematical Information Technology, University of Jyväskylä, Finland. My PhD Thesis “*Large-Scale Nonsmooth Optimization: Variable Metric Bundle Method with Limited Memory*” was *Approved with honours* (this grade is granted to top 5–10 percent of theses.)
- Licentiate of Philosophy (Scientific Computing), 2003. Department of Mathematical Information Technology, University of Jyväskylä, Finland.
- Master of Science (Organic Chemistry), 1998 Department of Chemistry, University of Jyväskylä, Finland.
- Student Matriculation, 1991. Liperi’s senior high school, Liperi, Finland.

OTHER NOTABLE STUDIES

- Mathematics and physics (included in my graduate studies)
- Teaching Role Workshop (2006) at the University of the Witwatersrand, Johannesburg, South Africa
- Several courses on high performance computing at CSC — IT Center for Science.

KNOWLEDGE OF LANGUAGES

- Finnish: native speaker.
- English: fluently.
- Swedish: satisfactorily.

WORK EXPERIENCE

- 1.9.2015 – 31.08.2020, Academy Research Fellow; Department of Mathematics and Statistics, University of Turku, Finland. Research project: Complex nonsmooth optimization.

- 1.8.2007 – 31.08.2015, Postdoctoral researcher / University teacher / Assistant (1.8.2014 – 31.8.2015, part time: 20% at unpaid maternity leave, 23.11.2012 – 31.7.2014, part time: 40% unpaid maternity leave); 14.1. – 22.11.2012, Maternity leave; 1.9. – 18.10.2013, 15.8. – 19.8.2011, 7.9. – 21.10.2010, Lecturer; Department of Mathematics and Statistics, University of Turku, Finland. Research area: Large-scale nonsmooth optimization and molecular modeling.
- 1.1.2007 – 31.7.2007, Assistant Professor / Senior Researcher in SCOMA project; Department of Mathematical Information Technology, University of Jyväskylä, Finland. Research area: Large-scale nonsmooth optimization and MLPs.
- 4.11.2005 – 3.11.2006, Postdoctoral fellow (grant); School of Computational and Applied Mathematics, University of the Witwatersrand, Johannesburg, South Africa. Research area: Large-scale nonsmooth optimization with various constraints.
- 1.6.2001 – 31.10.2005, Researcher / Research trainee; Department of Mathematical Information Technology, University of Jyväskylä, Finland. Research area: Large-scale nonsmooth optimization.
- 5.7.1999 – 31.5.2001, Part-time programmer / Research assistant; Department of Mathematical Information Technology, University of Jyväskylä, Finland. Different projects.
- 1.9.1998 – 30.4.1999, Researcher / Substitute research assistant; Department of Chemistry, Laboratory of Organic Chemistry, University of Jyväskylä, Finland. Research area: Synthesis of resorcinarenes.
- 25. – 28.9.1992, 29. – 30.10.1992, and 23.11. – 4.12.1992, Substitute Senior teacher; Liperi's senior high school, Liperi, Finland.

RESEARCH GRANTS

- Academy of Finland (2015): 434 485 euro for five years research post as Academy Research Fellow (Decision No. 289500).
- Academy of Finland (2015): 209 574 euro as initial funding for research costs (first three years) of Academy Research Fellow (Decision No. 294002).
- Turku University Foundation (2015): 500 euro for inviting a visiting researcher.
- Magnus Ehrnrooth Foundation (2014): 1 500 euro travel grant.
- Magnus Ehrnrooth Foundation (2010): 4 000 euro for the book project.
- Turku University Foundation (2010): 1 200 euro travel grant.
- Turku University Foundation (2010): 800 euro travel grant.
- Turku University Foundation (2010): 1 000 euro for inviting a visiting researcher.
- Magnus Ehrnrooth Foundation (2008): 2 500 euro travel grant.
- University of the Witwatersrand (2005): R101 000 for 12 month postdoctoral fellowship in the School of Computational and Applied Mathematics.
- Emil Aaltonen Foundation (2004): 7 000 euro for finishing the Doctoral Thesis.

PHD AND MSc STUDENT SUPERVISORS

- Kaisa Joki, PhD-student: “*Hybrid Methods in Nonsmooth Optimization*”, estimated time of graduation 2017. The other supervisors are Prof. Marko Mäkelä (University of Turku, Finland) and Prof. Adil Bagirov (University of Ballarat, Australia).
- Outi Wilppu, PhD-student: “*Multiobjective Nonsmooth Optimization*”, estimated time of graduation 2016. The other supervisors are Prof. Marko Mäkelä and Doc. Yury Nikulin (University of Turku, Finland).
- Seppo Pulkkinen, PhD-student: “*Efficient Optimization Algorithms for Nonlinear Data Analysis*”, in 2014. The other supervisor was Prof. Marko Mäkelä.

- Katariina Vaviolahti, MSc-student (first supervisor): “*Optimization problems in molecular modeling*”, in 2010.
- The second supervisor for six MSc-students. The first supervisor in these cases was Prof. Marko Mäkelä.

TEACHING

- Lecture course: *Todennäköisyyslaskentaa sivuaineopiskelijoille* (Probability Theory for Minor Students), University of Turku, in the falls 2010 and 2013.
- Intensive course: *Large-Scale and Supercomputing*, University of Turku, August 15 – 19, 2011 and June 1 – 5, 2015.
- I have been organizing the *Applied Mathematics Seminar* and *Applied Mathematics Seminar for Major Students*, 2010 – 2015.

INVITED LECTURES, TALKS AND ORGANIZED MINISYMPOSIUMS

- The South Pacific Continuous Optimization Meeting (SPCOM) 2015, Adelaide, Australia, February 8 – 12, 2015. Presentation (invited by organizers of SPCOM 2015): “Diagonal Bundle Method for Sparse Nonconvex Nonsmooth Problems”.
- The 20th Conference of the International Federation of Operational Research Societies (IFORS 2014) Barcelona, Spain, July 13–18, 2014. Organizing a session: “Nonconvex nonsmooth optimization methods”; presentation: “Diagonal Bundle Method for Sparse Nonconvex Nonsmooth Problems”.
- The 21st International Conference on Multiple Criteria Decision Making (MCDM), Jyväskylä, Finland, June 13 – 17, 2011. Presentation (in invited session organized by Prof. Marko Mäkelä): “Necessary and Sufficient Optimality Conditions for Generalized Convex Nonsmooth Multiobjective Optimization”.
- SIAM conference on optimization, Darmstadt, Germany, May 15 – 19, 2011. Presentation (in invited session organized by Prof. Antonio Frangioni): “Limited Memory Discrete Gradient Bundle Method for Derivative Free Nonsmooth Optimization”.
- The 24th European Conference on Operational Research (EURO XXIV), Lisbon, Portugal, July 11 – 14, 2010. Organizing a session: “Nonsmooth and Nonconvex Optimization Methods”; presentation: “Comparing Nonsmooth Optimization Methods and Software”.
- Federal University of Rio de Janeiro (UFRJ), Brazil, August 7, 2009. Lecture: “Introduction to Nonsmooth Optimization”.
- University of Kuopio, Department of Physics, Finland, April 16, 2008. Lecture: “Suurten optimointitehtävien numeerinen ratkaiseminen ja epäsiileä optimointi” (Numerical methods for Large-Scale and Nonsmooth Optimization).
- The 22nd European Conference on Operational Research (EURO XXII), Prague, The Czech Republic, July 8 – 11, 2007. Presentation (in invited session organized by Prof. Claudia Sagastizábal): “Limited Memory Interior Point Bundle Method”.

TEACHING DEMONSTRATION AND EVALUATIONS

- I was among the four best candidates (out of 40) for the Professorship in Operations Research (tenure track) at the Aalto University, 2013.
- My teaching demonstration for the position of an assistant professor in applied mathematics, University of Turku (April 14, 2008), was rated as *excellent*.

SCIENTIFIC TASKS AS AN EXPERT AND POSITIONS OF TRUST

- Outside Member of the Doctoral Committee of Jeffrey L. Steward, Dept of Scientific Computing at Florida State University, Tallahassee, Florida 32306-4120. PhD. Thesis: “*Practical Optimization Algorithms in the Data Assimilation of Large-Scale Systems with Non-linear and Non-smooth Observation Operators*“, 2011.
- Member of the International Scientific Committee in 2nd and 3rd International Conference on Engineering Optimization (EngOpt 2010: Lisbon, Portugal, September 6 – 9, 2010; EngOpt 2012: Rio de Janeiro, Brazil, July 2 – 6, 2012).
- Member of the Finnish Graduate School in Computational Sciences (fics-2009) programme committee, 2009.
- Member of the board of the Finnish Society of Computational Sciences from April 16, 2008 to February 10, 2010.
- A founder member and a deputy member of the board of the Finnish Society of Computational Sciences from June 13, 2007 to April 16, 2008.
- Member of the Computer Science Joint Entrance Examination workgroup at the University of Jyväskylä in spring 2007.
- Referee for Mathematical Programming (Math. Prog.), SIAM Journal on Optimization (SIOPT), European Journal of Operational Research (EJOR), Journal of Optimization Theory and Applications (JOTA), Journal of Computational and Applied Mathematics (COAP), Optimization Methods and Software (OMS), Journal of Mathematical Analysis and Applications (JMAA), and Numerical Algorithms (NUMA), Computational and Applied Mathematics (COAM), EURO Journal on Computational Optimization (EJCO), Journal of Computational and Applied Mathematics (CAM), Mathematical Programming Computation (MPC), Applied Mathematics and Computation (AMC).

RESEARCH VISITS

- Federal University of Australia, Faculty of Science and Technology with Prof. Adil Bagirov as a host. Ballarat, Australia, February 13 – 27, 2015.
- University of Ballarat, Centre for Informatics and Applied Optimization, School of Information Technology and Mathematical Sciences, with Prof. Adil Bagirov as a host. Ballarat, Australia, February 8 – 20, 2011.
- Federal University of Rio de Janeiro (UFRJ) in the Mechanical Engineering Program — COPPE with Prof. José Herskovits as a host. Rio de Janeiro, Brazil, June 1 – 18, 2008 and August 1 – 15, 2009.
- University of the Witwatersrand, School of Computational and Applied Mathematics with Prof. Montaz M. Ali as a host. Johannesburg, South Africa, November 4, 2005 – November 3, 2006.

PUBLICATIONS AND SOFTWARE DEVELOPMENT

- My book “*Introduction to Nonsmooth Optimization: Theory, Practice and Software*” (Springer) co-authored with Prof. A. Bagirov and Prof. M. M. Mäkelä was published 2014.
- I have published 17 papers in referred professional journals or conference proceedings (7 in last two years). One of my works “Globally Convergent Limited Memory Bundle Method for Large-Scale Nonsmooth Optimization” has been published in *Mathematical Programming A*, the leading journal in the research area. I have also written several research reports, one chapter for a book “*Big data and Optimization*” (Springer) and one unreferred conference proceedings.

- In addition to these conventional forms of publications, I have shared my work on my webpage <http://napsu.karmitsa.fi/>. There you can find, for instance, a short introduction to nonsmooth optimization, source codes for nonsmooth optimization solvers LMBM, LBB, D-Bundle, and LDGB that I have developed, and *Solver-o-matic* — an online decision tree for choosing a nonsmooth optimization solver.

OTHER MERITS

- Member of the board of residents' association *Torniopo* 2012 – 2015.

RESEARCH INTERESTS

- Nonsmooth (not necessarily differentiable), large-scale, and nonconvex optimization.
- Optimization problems in molecular modeling.
- Algorithm design.
- High performance computing.

REFERENCES

Additional information about me and my career can be acquired from

- *Prof. Marko M. Mäkelä*,
Department of Mathematics and Statistics, University of Turku,
FI-20014 Turku, Finland,
E-mail: makela@utu.fi, phone: +358 (0)2 333 5620.

Prof. Mäkelä was the supervisor of my doctoral thesis and has been my direct superior for over 10 years.

- *Prof. Adil Bagirov*,
Faculty of Science and Technology,
Federation University Australia,
Ballarat, Mount Helen, 3353, Victoria, Australia.
E-mail: a.bagirov@federation.edu.au.

Prof. Bagirov is a long-standing collaborator, with whom I work on several on-going projects.

Turku, Finland 20.08.2015

Napsu Karmitsa