



PETRI MYLLYMÄKI
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COMPLEX SYSTEMS COMPUTATION GROUP (CoSCo)
HELSINKI INSTITUTE FOR INFORMATION TECHNOLOGY
UNIVERSITY OF HELSINKI & HELSINKI UNIVERSITY OF
TECHNOLOGY, FINLAND

ACADEMIC PORTFOLIO

Basic information

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|--------------------------------|---|
| Full name | Petri Jukka Myllymäki |
| Date and place of birth | 7 February 1962, Mikkeli, Finland |
| Current employer | University of Helsinki, Finland |
| Current position | <i>Professor</i> , Head of Intelligent Systems at the Department of Computer Science (August 2003-July 2010). <i>Programme Director</i> , Helsinki Institute for Information Technology (HIIT) |

Previous professional appointments

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|-----------------|---|
| 08/1999→07/2003 | Academy Research Fellow, Academy of Finland |
| 08/1998→07/1999 | Research Scientist, Academy of Finland |
| 08/1997→12/1997 | Research Scientist, University of Helsinki |
| 01/1997→12/2001 | Assistant Professor, University of Helsinki |
| 08/1996→07/1997 | Research Scientist, Academy of Finland |
| 08/1995→07/1996 | Research Scientist, University of Helsinki |
| 03/1995→08/1995 | Academic Visitor, University of London |
| 08/1992→02/1995 | Research Scientist, University of Helsinki |
| 01/1992→07/1992 | Assistant, University of Helsinki |
| 03/1991→12/1991 | Research Assistant, University of Helsinki |
| 09/1988→02/1991 | Research Scientist, University of Helsinki |
| 10/1987→08/1988 | Research Assistant, University of Helsinki |

Education and training

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|------|---|
| 1999 | Docent of Computer Science (University of Helsinki, Finland) |
| 1995 | Doctor of Philosophy (Dept. of Computer Science, Univ. of Helsinki). Title of the Ph.D. thesis: <i>Mapping Bayesian Networks to Stochastic Neural Networks: A Foundation for Hybrid Bayesian-Neural Systems</i> . |
| 1994 | Licentiate in Philosophy (Dept. of Computer Science, Univ. of Helsinki). Title of the Ph.Lic. thesis: <i>Bayesian Reasoning by Stochastic Neural Networks</i> . |
| 1991 | Master of Science (Dept. of Computer Science, Univ. of Helsinki). Title of the M.Sc. thesis: <i>Teaching Multilayer Neural Networks with Optimized Backpropagation of Errors</i> (in Finnish). |
| 1981 | Matriculation examination (Mukkulan lukio, Lahti) |

Professional activities

Publication activities

Petri Myllymäki has published over 100 scientific articles in books, journals and conferences (see the publication list at <http://www.cs.helsinki.fi/petri.myllymaki/>) related to intelligent systems, especially in areas such as machine learning, data analysis and data visualization, probabilistic and information-theoretic modeling, neural networks, case-based reasoning, and stochastic optimization. His work is both theoretical and applied in nature, and the applied work has a strong multidisciplinary flavor. The conference papers have typically been published in high-quality conferences with a highly selective acceptance ratio (often less than 25%), so that the accepted full-length conference papers have passed a rigorous review process done by several expert reviewers, and are in many cases quite comparable to journal publications in this respect. The extensive 110-page tutorial *Prospects of Bayesian Networks* (in Finnish), written together with Henry Tirri for the National Technology Agency Tekes in 1998, has been a seminal reference for the Finnish industry for the theory and applications of Bayesian networks, and the tutorial has also been used as teaching material in several universities. Recently, Myllymäki was a co-editor of the Festschrift book published to honor the 75th birthday of Jorma Rissanen, the celebrated inventor of the MDL principle (and the recipient of the Shannon Award 2009), and co-editor of the Proceedings of The 24th Conference on Uncertainty in Artificial Intelligence, which is the main international annual conference in this area.

Board memberships

- Statistics and Computing, an international journal
 - Associate editor, 2010-→
- The EURASIP Journal on Bioinformatics and Systems Biology
 - guest editor for a special issue on Information-Theoretic Methods for Bioinformatics, 2006-2007
- ENTROPY, An International Journal of Entropy and Information Studies
 - member of the editorial board, 1998-2006
- Pascal EU Network of Excellence
 - member of the Pascal steering committee, 2003- 2011
 - manager of the special interest group on Information-Theoretic Modelling, 2005-2008
- Helsinki Institute for Information Technology
 - member of the board of directors, 2002-2006
 - programme director, member of the steering group, 2006→
- Helsinki Graduate School in Computer Science and Engineering
 - member of the board of directors, 2004→
 - member of the management group, co-head of the Pattern Analysis and Intelligent Systems thematic area, 2006→
- Department of Computer Science, University of Helsinki
 - member of the steering committee, 2007→
- Kumpula science library
 - member of the steering committee, 2007-2010
- Ekahau Inc.
 - chairman of the board of directors, 2000-2004
- Bayes Information Technology Inc.

- member of the board of directors, 2000-2003

Conference organization activities

- Programme and Conference Chair, Probabilistic Graphical Models (PGM'2010).
- Programme Chair, Uncertainty in Artificial Intelligence (UAI'2008).
- Technical Co-Chair, Workshop on Information Theoretic Methods in Science and Engineering (WITMSE'2008, WITMSE'2009, WITMSE'2010)
- Programme Co-Chair, 2008 Workshop on Recent Breakthroughs in MDL Learning.
- Area Chair, European Conference on Artificial Intelligence (ECAI'08)
- Organizing Chair, International Workshop on Intelligent Information Access (IIIA-2006)

Conference program committee memberships

- International Joint Conference on Artificial Intelligence (IJCAI-2009)
- Workshop on Mobile User Improved Interaction (MUI²-2007)
- IJCAI Workshop on Cross-Lingual Information Access (CLIA-2007, CLIA-2008)
- International Workshop on Intelligent Information Access (IIIA-2006)
- Uncertainty in Artificial Intelligence (UAI'03, UAI'04, UAI'06, UAI'07)
- Artificial Intelligence and Statistics (AISTATS'05, AISTATS'07)
- International and Interdisciplinary Conference on Adaptive Knowledge Representation and Reasoning (AKRR'05)
- NIPS 2005 Workshop on Machine Learning for Implicit Feedback and User Modeling
- International Conference on Applied Artificial Intelligence (ICAAI'03)
- International Conference on Machine Learning (ICML'01)
- International Conference on Case-Based Reasoning (ICCBR'01)
- The International FLAIRS Conference, special track on uncertain reasoning (FLAIRS'98, FLAIRS'99, FLAIRS'00).
- Second Nordic Workshop on Genetic Algorithms and Their Applications (2NWGA)

Referee for professional journals

- IEEE Transactions on Information Theory
- IEEE Transactions on Knowledge and Data Engineering
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Wireless Communications
- IEEE Transactions on Vehicular Technology
- Statistics and Computing
- Journal of the Royal Statistical Society
- Journal of Machine Learning Research
- Wireless Communications and Mobile Computing
- Data Mining and Knowledge Discovery
- Machine Learning
- International Statistical Review
- Applied Artificial Intelligence
- Knowledge Engineering Review
- International Journal on Very Large Data Bases
- Canadian Journal of Fisheries and Aquatic Sciences

- Acta Informatica
- International Journal of Neural Systems
- Nordic Journal of Computing

Referee for professional conferences

- IEEE International Symposium on Information Theory (ISIT)
- IEEE Information Theory Workshop (ITW)
- International Conference on Case-Based Reasoning (ICCBR)
- European Conference on Computational Learning Theory (EuroCOLT)
- European Conference on Artificial Intelligence (ECAI)
- European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD)
- European Conference on Case-Based Reasoning (ECCBR)
- European Workshop on Case-Based Reasoning (EWCBR)
- Scandinavian Conference on Artificial Intelligence (SCAI)
- International Conference on Applications and Theory of Petri Nets

Research awards and major stipendiary support for research

- The IADIS International Conference on Intelligent Systems and Agents, 2007: Outstanding paper award
- The 17th Belgian-Dutch Conference on Artificial Intelligence, 2005: Best paper award
- Jenny and Antti Wihuri foundation, 1993: Grant of 5 000 EUR for Ph.D. work and an academic visit abroad
- Leo and Regina Wainstein foundation, 1993: Grant of 5 000 EUR for Ph.D. work and an academic visit abroad
- Heikki and Hilma Honkanen foundation, 1992: Grant of 10 000 EUR for Ph.Lic. work.

The **Ekahau Positioning Engine**, a commercial software package based on Dr. Myllymäki's and his group's innovations, has won the following awards:

- European Union: The European Information Society Technology Prize 2002.
- Technology Marketing Corporation (TMC): Best product of the year 2002.
- Planet PDA, the Global Summit on Enterprise & Custom Volume Handheld Computing: Best of show.
- Software Industry Summit: Best commercialized innovation in Finland in 2002.
- SearchNetworking.com: Bronze medal, best product of the year 2003 (enterprise wireless applications and systems).
- Frost & Sullivan: Technology Leadership Award for Ekahau's Wi-Fi-based Positioning Technology Solutions, 2005
- The Wall Street Journal: Technology Innovation Award 2006, runner up in the wireless category.
- Emerging Technology Awards Competition: Finalist in the supply chain management category
- IT Week: Five Stars, Editor's Choice Award
- Security Week: Editor's Choice Award

- IP World: Editor's Choice Award
- Red Herring (May 2008): one of the top 100 tech start-ups in North America

The CoSCo group members, under supervision of Dr. Myllymäki, have won the following awards:

- The Finnish Association for Mathematicians, Physicists and Computer Scientists, best M.Sc. thesis of the year 2008 (Ville Tuulos)
 - The thesis, titled "Design and Implementation of a Content-Based Search Engine", describes the details of the Aino search engine (see below)
- Pascal Challenge on Inferring Relevance From Eye Movements, 1st prize (Tuomas Lepola)
 - The objective of the Challenge was to predict from eye movement data whether a reader finds a text relevant.
- CoIL Challenge 2000, 2nd prize (Petri Kontkanen)
 - The goal of the CoIL Challenge is to promote the application of computational intelligence and learning technology to real world problems, to clarify the relations between different approaches and to stimulate the search for solutions that combine different methods. The challenge is organized by the Computational Intelligence and Learning (CoIL) cluster. The second edition of the CoIL Challenge was held from March 17 until May 8, 2000. There were 147 participants registered.
- KDD Cup 2001, honorable mention, 2nd prize (Tomi Silander)
 - Knowledge Discovery and Databases prediction competition was participated by 114 participating international research groups in the Pharmaceutical prediction task concerning molecular bioactivity.

Patents

- Location estimation in wireless telecommunication networks (US2004072577 - 2004-04-15)
- Visualization method and visualization system (US6873325 - 2005-03-29)
- Error estimate concerning a target device's location operable to move in a wireless environment (US2005131635 - 2005-06-16)
- Sequence-based positioning technique (US2005136944 - 2005-06-23)
- Probabilistic model for a positioning technique (US2007117568 - 2007-05-24)

Periods of research abroad

Five months as an academic visitor at the Royal Holloway and Bedford New College, University of London, in 1995.

Consultancies

Petri Myllymäki has extensive experience of cooperation with international industry. The companies involved in his consulting activities include M-Brain (analysis of news streams), Kibron (applied intelligent methods in bioinformatics), Almamedia (analysis of web log data), ABB (hybrid probabilistic models in configuration of synchronous machines), Kone Corporation (Bayesian modeling in elevator technology), Nokia (stochastic optimization in telecommunication applications), StoraENSO (optimization in logistics problems), Space Systems Finland/European Space Agency (intelligent fault diagnosis systems for autonomous

space satellites), BayesIT (visualization of multidimensional data) and Ekahau (machine learning techniques for analysis of wireless data).

In the public sector Dr. Myllymäki has worked as a consultant for Helsinki University Central Hospital (analysis of cardiological data), VTT Biotechnology (analysis of bakery process data), Department of Health Policy and Management of University of Kuopio (analysis of medical treatment effectiveness data), the Finnish Police Department (analysis of crime data) and the Finnish Association on Intellectual and Developmental Disabilities (search engines for people with linguistic disabilities). He has also worked as a scientific reviewer and expert evaluator for the following organizations:

- The Hong Kong University of Science and Technology
- European Commission (in the Sixth Framework Research Programme)
- The Netherlands Organization for Scientific Research (NWO)
- Austrian Science Fund (FWF)
- National ICT Australia (NICTA)
- University of Waikato, New Zealand
- University of Southampton, UK
- Helsinki Graduate School in Computer Science and Engineering
- Academy of Finland
- The Finnish Work Environment Fund

Software developed for scientific use

B-Course. B-Course (<http://b-course.hiit.fi>) is a web-based interactive tutorial on Bayesian dependence modeling. Although originally designed primarily for educational purposes, B-Course can also be used as a sophisticated on-line data analysis tool for any research where dependence modeling is of interest. First version was released in November 2000 and a new version in November 2002. More than 15 000 users world-wide.

Aino. Aino Search Engine (<http://aino.hiit.fi>) is a prototype of a full-fledged Internet search engine for the whole .FI domain, consisting of about 15 million documents. Aino exploits novel statistical modeling techniques enabling content-based information retrieval.

P-Course. Software for probabilistic medical diagnosis. In test use at University of Kuopio.

Bayda. Software for Bayesian discriminant analysis (i.e., classification). Available at the CoSCo WWW site and freely downloadable for research and teaching purposes. More than 2000 users world-wide. Not maintained any more.

Software developed for commercial use

Ekahau Positioning Engine & Ekahau Site Survey. Software for positioning of mobile users in WLAN networks, and a tool for designing WLAN networks. Dr. Myllymäki is co-founder of the company and involved in four related patents.

BayMiner Commercial ASP service for intelligent data visualization, maintained by Bayes Information Technology Inc. In fielded use since 1999. Dr. Myllymäki is involved in one related patent.

Vaalikone/“Election machine” by Helsingin Sanomat. An ASP service for choosing a candidate in political elections. In public use at the Finnish Parliament elections in 2003 and 2007, in the European Parliament election in 2004, and in the communal election in 2008. Implemented together with Helsingin Sanomat, the largest newspaper in Finland.

Coptimi. Software for intelligent container packing. Cost-function based optimization for 3D-packing of ship containers aimed at paper industry. Successfully in fielded use at the world second largest company in paper industry, StoraEnso, since January 1999.

Externally funded research projects

Petri Myllymäki has been the responsible leader of the following research projects (with a total funding of over 5 million euros):

- *Tools for Virtual Collaborative Innovation (VISCI TOOLS)* (together with Dr. Patrik Floréen)
 - Duration: 2010-2011, Funding: Tekes
- *Adaptive Interfaces for Consumer Applications (AICA)* (together with Dr. Patrik Floréen)
 - Duration: 2009-2011, Funding: Tekes
- *Science Workshop Series on Stemmatology* (together with Prof. Tuomas Heikkilä and Dr. Teemu Roos)
 - Duration: 2009-2010, Funding: The Finnish Cultural Foundation
- *Virtual Intelligent Space for Collaborative Innovation (VISCI)* (together with Dr. Patrik Floréen)
 - Duration: 2009-2012, Funding: Academy of Finland
- *Applications of the MDL Principle to Prediction and Model Selection and Testing (ModeST)*
 - Duration: 2009-2012, Funding: Academy of Finland
- *Erityisryhmille soveltuva suomenkielinen hakukone (SelkoHaku)*
 - Duration: 2008-2009, Funding: The Finnish Association on Intellectual and Developmental Disabilities
- *Personalised Ubiservices in Public Spaces (PUPS)* (together with Dr. Patrik Floréen)
 - Duration: 2007-2009, Funding: Tekes
- *Cognitive-Level Annotation using Latent Statistical Structures (CLASS)*
 - Duration: 2006-2008, Funding: EU
- *Cognitively Inspired Visual Interfaces for Representing Multidimensional Information (CIVI)*
 - Duration: 2005-2008, Funding: Academy of Finland
- *MDL-Based Methods for Denoising Image Signals (KUKOT)*
 - Duration: 2006-2007, Funding: Tekes
- *Probabilistic Methods for Microarray Data (PMMA)*
 - Duration: 2004-2007, Funding: Tekes.
- Scalable Probabilistic Methods for the Next Generation Search Engine (Prose)
 - Duration: 2003-2006, Funding: Academy of Finland.
- *Superpeer Semantic Search Engine (Alvis)*

- Duration: 2004-2006, Funding: EU
- An EU STREP with 11 partners, Dr. Myllymäki being the coordinator
- *Search-in-a-box (SIB)*
 - Duration: 2004-2006, Funding: Tekes, Almamedia, Nokia, M-Brain, Finnish Patent Office
 - A national consortium with 3 academic partners, Dr. Myllymäki being the coordinator
- *Normalized Compression Distance Measures and Their Applications in Unsupervised and Supervised Analysis of Polymorphic Data*
 - Duration: 2004-2005, Funding: EU/Pascal NoE
- *Proactive Information Retrieval by Adaptive Models of Users' Attention and Interests (Prima)*
 - Duration: 2003-2005, Funding: Academy of Finland
- *Computationally Efficient Probabilistic Learning and Reasoning (Cepler)*
 - Duration: 2002-2004, Funding: Academy of Finland.
- *Personalized Location-Dependent Services in Wireless Networks (Wirne).*
 - Duration: 2003-2004, Funding: Ekahau Inc.

The total budget of these projects is over 5 million euros.

Dr. Myllymäki has also worked in the past as the project manager and the principle scientist in several basic research and applied research projects. The application areas addressed by the applied research projects include bio-informatics (drug design), ecology (modeling of Baltic salmon stocks), medicine (cardiological analysis, health care policy and management), criminology (crime linking and criminal profiling), hardware design (fault diagnosis in space satellites, elevator configuration), telecommunications (frequency allocation, network topology optimization), adaptive interfaces and web site design (adaptive models of WWW usage data).

The individual projects managed by Petri Myllymäki include the following 8 with a total funding of over 3 million euros):

- *Analysis of Multivariate Biological Data (Bidma)*
 - Duration: 2002-2004, Funding: Kibron Inc.
- *Minimum description length modeling in computer science and statistics (MINOS)*
 - Duration: 2002-2005, Funding: Academy of Finland
- *Computationally Efficient Methods for Deep Computing (DeepC)*
 - Duration: 2000-200, Funding: Academy of Finland
- *Personalized Adaptive Interfaces (PAI)*
 - Duration: 2000-2002, Funding: TEKES, AlmaMedia, Ekahau, BayesIT
- *Probabilistic Modeling of Baltic Salmon Stocks (Promos)*
 - Duration: 2000-200, Funding: European Commission
- *Software for Autonomous Spacecraft (SFAS)*
 - Duration: 2000-2001, Funding: Space Systems Finland, European Space Agency (ESA)
- *Applications of Probabilistic Modeling and Search Methods (PROMISE)*
 - Duration: 1998-2000, Funding: TEKES, Nokia, Kone, TietoEnator, BayesIT
- *Computationally Intelligent Hybrid-Paradigm Environments (HYPE)*

- Duration: 1994-1998, Funding: TEKES, ABB, Kone, Nokia Research Center, Nokia Telecommunications
- *Software tools for Case-Based Reasoning (CABINET)*
 - Duration: 1994-1995, Funding: TEKES, Kone
- *Reasoning by Examples (REX)*
 - Duration: 1992-1994, Funding: TEKES, Kone

Teaching and researcher training activities

Dr. Myllymäki is an original member and a co-founder of the Complex Systems Computation Research Group (CoSCo) started at the University of Helsinki in 1994, and he has been leading the group since August 2003. The CoSCo group consists currently of 2 post-doctoral researchers, 5 PhD students and several M.Sc. students working in the area of probabilistic and information-theoretic modelling and data analysis in computer science and statistics. In spring 2001 the group was joined by Dr. Jorma Rissanen, recipient of the Shannon Award 2009, who is best known by his seminal work on arithmetic coding and MDL principle, and in spring 2002 by Dr. Wray Buntine from US, who is one of the most highly appreciated scientists in the field of probabilistic modelling (Buntine returned to his home country Australia in 2007, but collaborates still actively with the CoSCo group in several projects). In two (1997,1999) evaluations of the Research programmes of the Finnish Funding Agency for Technology and Innovation (Tekes) and in an evaluation by Academy of Finland (Madame Programme), the group has received excellent remarks for both the theoretical and more applied work. In the November 2004 evaluation of the HIIT institute, the scientific advisory board stated: *“This is an internationally recognised, world-class group with a high impact working in crosscutting areas. It performs impressive end-to-end research from abstract theory through to practical applications leaning towards the practical end. ... The team is excellent in both theoretical and practical engineering terms.”*

As can be seen from above, in the past Dr. Myllymäki has been working frequently as a project leader or manager in externally funded projects funded by Academy of Finland, Finnish Funding Agency for Technology and Innovation (Tekes), European Union, industrial companies and public foundations. Consequently, he is highly experienced in training and managing different size research groups.

Since August 2003 Dr. Myllymäki has worked as a professor of the Department of Computer Science of University of Helsinki leading the Intelligent Systems specialization area. He is responsible for the supervision of all M.Sc. and Ph.D. students in this area, and for planning and organizing the curriculum for Intelligent Systems. He has supervised over 40 M.Sc. students and has personally given (several times) the courses “Graphical Models” (with Wray Buntine), “Three concepts: Information”, “Three Concepts: Probability”, “Probabilistic Models” and “Project in Probabilistic Models” and several seminars on topics related to Intelligent Systems, Intelligent Information Retrieval and Causal Models. Recently he was in charge of organizing the popular “Tietotekniikka Nyt!” guest lecture series. In addition, Dr. Myllymäki has taught scientific writing, and has participated in teaching by working as a manager and/or client in several software development exercise projects (1989, 1990, 1992, 1994, 1996 and 1998). He has also given guidance for the use of computing facilities of the university in 1986, 1987 and 1992, and worked as a teaching assistant for the course Neural Networks in 1993. His teaching skills

have also been formally evaluated several times through public “test lectures”, most recently in December 2008, when he was considered highly qualified as a teacher.

The post-docs of Prof. Myllymäki are Teemu Roos (2007), Tomi Silander (2009), Tommi Mononen (2009) and Petri Kontkanen (2009). Two other students (Jukka Perkiö and Hannes Wettig) are expected to finish their dissertations soon. Teemu Roos received the best young research award of Department of Computer Science in 2007, was selected in 2008 on the Classification Society Distinguished Dissertation Award Shortlist, and was received in 2009 the Cor Baayen Award given by the European Research Consortium for Informatics and Mathematics for the most promising young researcher in Europe. Ville Tuulos, who finished his M.Sc. degree under supervision of Dr. Myllymäki in 2007, was in 2008 granted the best M.Sc. thesis of the year award by the Finnish Association for Mathematicians, Physicists and Computer Scientists.

The extensive 110-page tutorial *Prospects of Bayesian Networks* (in Finnish), written together with Henry Tirri for the National Technology Agency Tekes in 1998, has been used as teaching material in several universities. Dr. Myllymäki has also been involved in projects developing new technologies for e-learning environments, and some of the results have been used in several universities in Finland. In international scientific events he has given 2 tutorials and dozens of invited or refereed oral talks or posters.

Tutorials and invited talks

- MDL Interval Estimation
 - Invited talk at the 2010 Information Theory and Applications Workshop, San Diego, February 2010 (together with Jorma Rissanen)
- Experiences on Innovation Trails (Kokemuksia innovaatiopoluista)
 - Invited talk at a Brainstorming Seminar on Innovations, Paris, France, 21.-24.1.2009
- Personalized Ubiservices in Public Spaces
 - Invited talk at Tronshow 2009, Tokio, Japan, 11.12.2008
- Scientific research as incubator for software innovations (Tieteellinen huippututkimus ohjelmistoalan innovaatioiden synnyttäjänä)
 - Invited talk at the annual boat seminar of Sytyke ry (Finnish association for people working in system design), Helsinki/Stocholm, 10.-12.09.2008.
- Recent advances in computing the NML for discrete Bayesian networks.
 - Invited talk at the 2008 Workshop on Information Theoretic Methods in Science and Engineering, Tampere, Finland. August 18-20, 2008.
- Fast computation of NML for Bayesian networks.
 - Invited talk at the ICML/UAI/COLT workshop on Recent Breakthroughs in Minimum Description Length Learning. Helsinki, Finland, July 9, 2008.
- Towards Intelligent Information Access
 - Invited talk at the seminar “Viisautta tiedosta”, organized by M-brain Inc. on May 15, 2008
- Prospects of Information Retrieval in the Future (Tulevaisuuden tiedonhaun mahdollisuudet)
 - Invited talk at the Finnish Association on Intellectual and Developmental Disabilities, Helsinki 22.01.2008

- The Future of Search
 - Invited talk at the Information Days 2007 Congress and Exhibition (Helsinki, October 18, 2007)
- Intelligent Information Access
 - Invited talk at the seminar on technologies of the future, organized by the Finnish Defence Forces (Helsinki, May 2006)
- B-course: a web-based tool for Bayesian and causal data analysis
 - Invited talk at the Finnish Mathematical Days 2006 (Tampere, January 2006)
- Probabilistic Modeling with Bayesian Networks (1996,1997)
 - Half day tutorial at the HECSE Winter School 1997 (Helsinki, January 1997)
 - Two day tutorial at the CIDEC Winter School “Trends in Computer Science and Information Technology”, Palmse, Estonia 1997.
 - One-day tutorial 7th Finnish Artificial Intelligence Conference, Vaasa 1996.
- On Probabilistic Modeling and Bayesian Networks (2002, 2003).
 - Invited talks at the BayMiner™ user seminars 05.09.02, 16.01.03, 30.10.03, 13.11.03, 11.03.04, 17.02.05, 19.05.05.

Opponent or external referee for academic dissertations

- Simo Ali-Löytty: Gaussian Mixture Filters in Hybrid Positioning". Ph.D. thesis, Tampere University of Technology, 2009.
- Seow Chee Kiat: Localization in multipath environments. Ph.D. thesis, Nanyang Technological University, Singapore, 2008.
- Jarkko Salojärvi: Inferring Relevance from Eye Movements with Wrong Models. Ph.D. thesis, Helsinki University of Technology, 2008.
- Tapani Raiko, Bayesian Inference in Nonlinear and Relational Latent Variable Models. Ph.D. thesis, Helsinki University of Technology, 2006.
- Jarmo Kukkonen: An Evaluation of Effectiveness of Public Health Services on the Basis of Routinely Collected Data. Ph.D. thesis, Kuopio University. Kuopio University Publications D. Medical Sciences 355, 2005.
- Juha-Pekka Koskinen: Estimation of Paper Machine Spare Part Maintenance Life Cycles from Customer Orders. Licentiate thesis, Tampere University of Technology, 2004.
- Mikko Koivisto: Sum-Product Algorithms for Analysis of Genetic Risks. Ph.D. thesis, University of Helsinki, 2003.
- Janne Sinkkonen: Learning Metrics and Discriminative Clustering. Ph.D. thesis, Helsinki University of Technology, 2003.
- Jesus Cerquides: Improving Bayesian Classifiers. Ph.D. thesis, Technical University of Catalonia, Spain, 2003.
- Anssi Lensu: Computationally Intelligent Methods for Qualitative Data Analysis. Ph.D. thesis, University of Jyväskylä, 2002.
- Harri Valpola: Bayesian Ensemble Learning for Nonlinear Factor Analysis. Ph.D. thesis, Helsinki University of Technology, 2001.
- Sami Saalasti: Time Series Prediction and Analysis with Neural Networks. Licentiate thesis, University of Jyväskylä, 2001.