

Curriculum Vitae for Karl Åström

Married since 1994 with Lena Åström, three children: Oskar born 16 May 1998, Sofia born 24 May 2000 and Love born 25 May 2004.

Home address

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Work Address

Centre for Mathematical Sciences, Lund University,
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Education

PhD Dept of mathematics, Engineering faculty, Lund University, May 30 1996, 'Invariancy Methods for Points, Curves and Surfaces in Computational Vision'. Supervisor Gunnar Sparr.

Licentiate in Engineering Dept of mathematics, Engineering faculty, Lund University, January 15 1994, 'Object Recognition using Affine and Projective Invariants of Planar Sets'. Supervisor Gunnar Sparr.

Master of Science Engineering Physics, August 31 1991, grade point average 5.0 (maximum is 5.0). Masters thesis: 'Where am I and what am I seeing? Algorithms for a Laser Guided Vehicle'.)

Bachelor of Science in mathematics, January 31 1990.

Work Experience

Lund University Professor at the department of mathematics Lund University, 020101 to present.

Decuma Research and development, Decuma AB, 000401 to 011231. 20% research and development.

Lund University Associate professor at the department of mathematics Lund University, 991001 to 011231. 80% research and teaching.

Lund University Lecturer at the department of mathematics Lund University, 990501 to 990930.

Lund University Post doctoral fellow at the department of mathematics Lund University, 961001 to 990430. The position includes 75% research and 25% teaching.

Lund University PhD student position 920101-960930. The position includes 67% research studies and 33% teaching.

NDC Laser AB, Luleå. Development and testing of a laser positioning system for a self guided vehicle during 16 weeks in the summer 1990 and 1991. Consulting during fall 1990, spring 1991 and spring 1994.

Satt Control, Malmö. Circuit board manufacturing for five weeks in the summer of 1989.

Military Service. 1987-88. Mathematical Crypto Analysis. This included 1185 hours applied training on mathematical problem solving and FORTRAN programming. 9706??-9808??.

NAF Controls, Lund. Consulting and real time programming during 1986.

Teaching Experience

LTH. Course in **Image analysis**, autumn 2000, 2001, 2002, 2003, 2006. Lectures, construction of exams, development of new laboratory sessions, supervision of projects. (Ref: Gunnar Sparr)

LTH. Development and execution of a undergraduate course in Computer Vision. 14 Lectures, 4 laboratory sessions, 5 home exercises, exercises, and exam.

LTH. Developed a new course in **Linear and Combinatorial Optimization**, spring 1997. 14 Lectures, 2 laboratory sessions, home exercises and exam. (Ref: Gunnar Sparr, Lars-Christer Böiers). I have now given this course 3 times.

LTH. Basic course in **Linear algebra** for first year engineering students, autumn 1997. Lectures with 150 students, small group exercises, marking of exams etc. (Ref: Lars-Christer Böiers)

PhD course in Computer vision. A computer vision course sponsored by the VISIT project. 25 students from all over Sweden and Denmark. May and August 1999. (Ref: Lennart Thurfjell)

Summer school - VISIT. One day course in computer vision. (Ref: Lennart Thurfjell)

Kaiserslautern. Invited one week course in computer vision at Technomathematics programme at the University of Kaiserslautern, spring 1998.

LTH. Miscellaneous courses in mathematics. Marking of exams from spring 1992. Teaching in small groups from spring 1989 to present. (Ref: Lars-Christer Böiers)

LTH. Övningsledare i matematik vid tekniska högskolan från VT-89 till HT-90 samt fr o m VT-92. (Ref: Lars-Christer Böiers)

LU. Räknestugeledare i matematik vid universitet HT-88.

Supervision

Summer school

Supervisor for two students at a research summer school 1993.

Masters thesis students

Has supervised about 50 masters thesis students.

Licentiate thesis

Johansson, B.: Topics on View Synthesis, (licentiate thesis), 2000.

Oskarsson, M.: One-dimensional Retina Vision — with Applications in Structure and Motion Estimation, (licentiate thesis), 2000.

Ericsson, A.: Automatic Shape Modelling and Applications in Medical Imaging, (licentiate thesis), 2003.

Stewénus, H.: Studies in Mobile Camera Calibration, (licentiate thesis), 2003.

Sternby, J.: Core Points - Variable and Reduced Parametrization for Symbol Recognition, (licentiate thesis), 2005.

Eriksson, A.: Bijective Thin-Plane Spline Mappings with Applications in Computer Vision, (licentiate thesis), 2005.

PhD thesis supervised as main supervisor or co-supervisor

Johansson, B.: Computer Vision using Rich Features - Geometry and Systems, 2002.

Oskarsson, M.: Solutions and their ambiguities for structure and motion problems, (PhD thesis), 2002.

Stewénus, H.: Gröbner Basis Methods for Minimal Problems in Computer Vision, (PhD thesis), 2005.

Ericsson, A.: Automatic Shape Modelling with Applications in Medical Imaging, (PhD thesis), 2006.

Barr, O.: Discrete Methods used in Graph Theory and Linear Programming, (PhD thesis), 2007.

Eriksson, A. Optimization Methods for Large Scale Combinatorial Problems and Bijectivity

Constrained Image Deformations, 2008.

Sternby, J. Template Based Recognition of On-Line Handwriting, 2008.

Karlsson, J. Towards Fully Automatic Optimal Shape Modeling, 2008.

Lindström, J. Spatio-Temporal for Mixture Models and Gaussian Markov Random Fields, 2008.

Olsson, C. Global Optimization in Computer Vision: Convexity, Cuts and Approximation Algorithms, 2009.

Ardö, H. Multi-target Tracking Using on-line Viterbi Optimisation and Stochastic Modelling, 2009.

Byröd, M. Numerical Methods for Geometric Vision: From Minimal to Large Scale Problems, 2010.

Doctoral students

Currently supervising or co-supervising: Olof Enquist, Yubin Kuang, Erik Ask, Charlotte Soneson, Fangyuan Jiang, Simon Burgess, Hanna Källén.

Awards

Cognimatics AB (which I co-founded in 2003) got the Rapidus 'company of the year' award in 2011.

Cognimatics AB (which I co-founded in 2003) got one of the Vinn Nu awards 2003.

Honorary mention in the innovation prize 2003 in Lund.

Decuma AB (which I co-founded in 1999) got the EU IST Grand Prize award 2003.

Nordic Award for the best PhD Thesis in Pattern Recognition 1995-1996, presented at the Scandinavian Conference for Image Analysis in Lappeenranta 1997.

First place in Innovation Cup 1991, a national competition for innovative ideas, for the development of a laser positioning system for a self guided vehicle.

Frembergs scholarship for promising mathematics student Lund University 1987.

Honorable mentioning Olympics in Physics, London 1986 (best among swedish participants).

Participation in the Olympics in Mathematics, Warsaw 1986.

Third place in the Swedish National Mathematics Competition 1986.

Third place in the Swedish National Physics Competition 1986.

Third place in the Swedish National Chemistry Competition 1986.

Invited lectures

Invited lecture 'Bildanalysens möjligheter' at the seminar 'Bildanalys för livsmedelsindustrin', Lund, 24 april 2001.

Invited paper 'Multiple View Vision' at the International Conference on Pattern recognition, Barcelona, 3-8 September, 2000.

Invited lecture 'Recent trends in Computer Vision and its Potential Applications to Biological Imaging' at the BioImaging workshop of BioConference98, Lund, 8 September 1998.

Invited opening lecture 'Affine and Projective Normalization of Planar Curves and Regions' at the Danish Conference on Image Analysis and Pattern Recognition, Copenhagen University, August 25-26 1993.

Research Projects

I have participated in planning and execution of research with external funding. In particular the projects:

Elliit, 2010-.

SSF Wearable Visual Systems, 2009-2013.

SSF ENGROSS, 2009-2013.

Vinnova Automet, 2007-2010.

VR Polynomial Equations in vision, 2009-2011.

VR Multi-camera vision, 2006-2008.

KK/KI/MAS Information management in Dementia, 2003-2007.

EU IST-2001-34405 LAVA (Learning for Adaptable Visual Assistants), 2002-2005.

VR Image variations with medical applications, 2001-2003.

VR Artificial visual systems, 2001-2002.

NDC Externally financed project for development of computer vision for autonomous guided vehicles. A product called Autosurveyor II was released in spring 1999.

EU- financed 6448 SMErobot, 920101-941231.

EU-ESPRIT project LAVA, 020601-050531.

EU-ESPRIT financed reactive Long Term Research project 21914 CUMULI, 960901-990831.

EU-ESPRIT financed basic research action 6448 VIVA, 920101-941231.

SSF financed project VISCOS 2, Vision in Cognitive Systems.

SSF financed project VISCOS, Vision in Cognitive Systems.

SSF financed project NTM, Network in Applied Mathematics.

SSF financed project VISIT, VISual Information Technology.

I have participated in part in the following projects:

TFR financed project Dynamic Vision and Dynamic Vision 2 (95-64-222).

Professional activities

External examination

External examiner at Phd dissertations:

Eric Hayman (Oxford University, 2000),

Barbara Caputo (KTH, 2005),

Christina Grönwall (LiU, 2006)

Jens Månsson (LU, 2006)

External examiner at Licentiate theses

Anders Lundquist (KTH, 1997),

Jörgen Ahlberg (LiU, 1999),

Gunnar Farnebäck (LiU, 1999)

Karin Althoff (CTH, 2001),

Committee member at PhD dissertations

Patric Jensfelt (KTH, 2001),

Lars Arvastson (LTH, 2001, suppl),

Journal paper reviewer

Reviewer for IEEE TRANS. PAMI, International Journal of Computer Vision, Computer Vision and Image Understanding, Journal of Mathematical Imaging and Vision.

Conference work

Reviewer for numerous conferences including the European Conference on Computer Vision, the Scandinavian Conference on Image Analysis.

Member of the organizing committee for the Swedish Symposium on Image Analysis (hosted by the Swedish Society for Automated Image Analysis) in Lund, 1996.

Member of the program committee for the conference Statistical Methods for Image Processing that is going to be held August 6-9, 1999 at Uppsala University, Uppsala, Sweden. Editor of the proceedings of that will be published with the Pattern Recognition Letters.

Member of the program committee for the workshop on Vision Algorithms: Theory and Practice that will be held in conjunction with the International Conference on Computer Vision, Corfu, Greece, 1999.

Member of the program committee for the International Conference on Computer Vision, Vancouver, Canada, 2001.

Member of the program committee for the European Conference on Computer Vision, Copenhagen, Denmark, 2002.

Member of the program committee for the International Conference on Computer Vision, Nice, France, 2003.

Member of the program committee for the European Conference on Computer Vision, Prague, 2004.

Administrative work

Head of division, mathematics (engineering faculty) and numerical analysis (engineering and science faculty) of the centre for mathematical sciences, 2009-.

Member of forskningsnämnd 1, 2009-2011.

Chairman of the research senate at LTH 2007-2008.

Member of the research board 'forskningsberedningen' of LTH 2006-2009.

Member of Scientific Council for STFI-Packforsk, 2004-2006.

Cofounder and chairman of the Board of the company Cognimatics AB (algorithms for cognitive vision in handheld computers and mobile phones).

Cofounder and previously a member of the Board of the company Decuma AB (algorithms for hand writing recognition).

Member of the Board of Lund Institute of Technology, 2000-2005

President of the Swedish Society for Automated Image Analysis, from spring 1998 to spring 2002.

Member of the governing board of the International Association for Pattern Recognition, from spring 1998 to spring 2002.

Member of the research board EFD, from autumn 1994 to spring 1996.

Member of 'Yngre rådet' a council for the engineering faculty consisting of young researchers/teachers, 1998.

Member of the board at the department of Mathematics, Lund University, 1997-1998

Member of the 'avdelningsråd' for 'matematik, LTH' at the centre for mathematical sciences, Lund University, from 1999.

Member of the teaching board for EFD, autumn 1996 to spring 1997.

Founder and previous member of the board of the society 'Film in Lund'. Grundare och medlem

i styrelsen för insamlingsstiftelsen Film I Lund.

Foreman for Lund Mathematical Society, 1997-1998.

Publications and Patents

Papers in journals: 24. Book chapters: 4. Refereed conference contributions: 63. Other conference contributions: 20. Examiner at PhD dissertations: 3. Examiner at licentiat theses: 5. Programme committee member at SMIP, ICCV, ECCV, CVPR, ICPR, SCIA, Reviewer for IEEE PAMI, IJCV, CVIU, JMIV. Organizer of Swedish Symposium on Image Analysis 1996, 2002, 2008.