

Curriculum Vitae

1. Personal data

1.1 **Name:** Håkan Lennerstad.

1.2 **Date of birth:** April 3, 1952, in Göteborg, Sweden.

1.3 **Address (home):**
Ronnebygatan 47
S-371 33 Karlskrona
phone: +733-800148

1.4 **Address (work):**
Sektionen för Teknik
Blekinge Tekniska Högskola
S-371 79 Karlskrona
phone: +46-455385455
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1.5 **Present employment:** Employed April 1, 1992 by Blekinge Institute of Technology as “universitetslektor i matematik”.

1.6 **Previous employments and educations:**

	years
Education as master of science, physics, CTH (Chalmers University of Technology)	71-77
Mechanic at Volvo Corporation, Göteborg	78 - 83
Graduate studies at CTH (defense of thesis: 19 feb. - 90)	83 - spring 89
Grant at the Mittag-Leffler institute, Djursholm, Stockholm	fall 89
Post doctorate grant at University of South Carolina, USA	90
Assistant professor, temporary position, CTH	91
Assistant professor, BTH (Blekinge Institute of Technology), Sweden	92 -01
Assistant/Associate professor, MAH (Malmö University), Sweden	fall 01 - spring 02
Associate professor, KTH (Royal Institute of Technology)	spring -05
Associate professor, BTH (Blekinge Institute of Technology), Sweden	fall 05 - 13
Professor, BTH (Blekinge Institute of Technology), Sweden	13 -

1.7 **Union memberships**

	years
Metall	78 - 83
SULF	83 - 07
Läraryrket	07 -

2. Exams, grants, appointments

	year of exam
2.1 Master of engineering, technical physics, CTH, Chalmers University of Technology	77
Ph. D. (Teknologie doktor) at CTH	90
2.2 Docent in applied mathematics, BTH	02
2.3 Research grant at the Mittag-Leffler institute, Djursholm, Stockholm	fall 89
Post doctoral grant at University of South Carolina, USA.	90
Grant from Council for the Renewal of Higher Education, For the project “Student influence on text books”	03
2.4 Scientific expertise	
Expert for senior lectureship in mathematics at University of Borås, Sweden	96
Expert for senior lectureship in mathematics at University of Växjö, Sweden	02
Faculty opponent for doctoral dissertation of Khalid el Gaidi, supervisor Bo Göransson, Knowledge, Skill and Technology, KTH	07

Expert for research application at Linneus university: ” Pilotprojekt vid Sjöfartshögskolan – som rekrytering av industridoktorand”.	10
Expert for promotion of Per-Anders Svensson to senior lecturer at Linnéuniversitetet.	10
Reviewer for submitted reports for Journal of Parallel Computing and International Journal of Navigation and Observation	12
Expert for Skolverket: development and review of “Matematiklyftet”	13
Faculty opponent for licensiate thesis “Hur kan dubbelt så långt bli fyra gånger större”, Jenny Svantesson Wester, Göteborgs Universitet	14
Guest professor at Linneus University, 30%	16

2.5. Graduate supervision

Assistant supervisor for doctoral degree in computer science:

Kamilla Klonowska (main supervisor: Lars Lundberg). Doctoral thesis: Theoretical Aspects on Performance Bounds and Fault Tolerance in Parallel Computing dissertation: 07

Main supervisor for doctoral degree in mathematics:

Doctoral thesis: Efraim Laksman, Combinatorial Optimization – Three Applications dissertation: 12

Assistant supervisor for doctoral degree in mathematics education:

Lucian Olteanu (main supervisor: Mona Holmqvist Oleander). Doctoral thesis: Framgångsrik kommunikation i matematikklassrummet dissertation: 16

Main supervisor for licensiate degree in mathematics:

Henrik Fredriksson, A dependency framework for links in a network planned disstertation : 18

2.6. Patent

The direction display, Sweden 96

Dynamic word processing, Sweden 96

3. Scientific merits

3.1 Books

Research monograph: Optimal Scheduling Combinatorics, (211 pages) with Lars Lundberg, Electronic Notes in Discrete Mathematics, Vol. 14, Elsevier, May 2003.

3.2 Refereed research journal articles

Mathematics, computer science, information theory

Localized Galerkin estimates for boundary integral equations on Lipschitz domains, with V. Adolfsson, M. Goldberg, B. Jawerth, SIAM J. on Math. An., 23(5): 1356 - 1374, 1992.

An optimal execution time estimate of static versus dynamic allocation in multiprocessor systems, with Lars Lundberg, SIAM J. Comput., 24(4): 751-764, 1995.

Bounding the Gain of Changing the Number of Memory Modules in Shared Memory Multiprocessors, with Lars Lundberg, Nordic J. Comput., 4(2): 233-258, 1997.

Using Recorded Values for Bounding the Minimum Completion Time in Multiprocessors, with Lars Lundberg, IEEE Trans. Parallel Distrib. Syst. 9(4): 346-358, 1998.

Optimal Bound on the Gain of Permitting Dynamical Allocation of Communication Channels in Distributed Processing, with Lars Lundberg, Acta Inf., 36(6): 425-446, 1999.

Optimal worst case formulas comparing cache memory associativity, with Lars Lundberg, SIAM J. Comput., 30(3): 872-905, 2000.

Optimal Combinatorial Functions Comparing Multiprocess Allocation Performance in Multiprocessor Systems, with Lars Lundberg, SIAM J. Comput. 29(6): 1816-1838, 2000.

An upper bound on the minimum Euclidean distance for block coded phase shift keying, with Magnus Nilsson, IEEE Trans. of Inf. Th., 46(2),: 656-662 2000.

Comparing the Optimal Performance of Parallel Architectures, with Kamilla Klonowska, Lars Lundberg, Magnus Broberg, Comput. J. 47(5): 527-544, 2004.

Optimal Recovery Schemes in Fault Tolerant Distributed Computing, with Kamilla Klonowska, Lars Lundberg, Charlie Svahnberg, Acta Inf. 41(6): 341-365, 2005.

Guaranteeing Response Times for Aperiodic Tasks in Global Multiprocessor Scheduling, with Lars Lundberg, Real Time Systems 35(2), 135-151, 2007.

The Maximum Gain of Increasing the Number of Preemptions in Multiprocessor Scheduling, with Lars Lundberg and Kamilla Klonowska, Acta Inf., 46(4): 285-295, 2009.

Improving Bounds on the Minimal Euclidean Distance for Block Codes by Inner Metric Optimization, with Magnus Nilsson and Efraim Laksman, Jou. of Disc. Math., Vol 310(22), 3267-3275, 2010.

Decomposing rational numbers, with Lars Lundberg, Acta Arithm., 145(3): 213-220, 2010.

Optimal Computer Crasch Performance Precaution, med E. Laksman, L. Lundberg, Discrete Mathematics & Theoretical Computer Science, Vol 14, No 1, 2012.

Generalized Upper Bounds on the Minimum Distance of PSK Block Codes, med E. Laksman, M. Nilsson, IMA Jou. Maths. Control & Info 32 (2), 2015.

A new formula for the statistical weight for a sequence of Rydberg levels in an atom or ion, med M. Eriksen, Journal of Physics: Conf. Series **869** (1), article id. 012010, 2017.

The n-dimensional Stern-Brocot tree, accepted by International Journal of Number Theory, 2017.

Mathematics education

Logical graphs - how to map mathematics, Zentralblatt für Didaktik der Matematik (International Reviews on Mathematical Education) 96/3, 1996.

Logiska grafer - att kartlägga matematik, Normat, Hefte 3, 1996.

Matematik och mänsklighet, Tvärsnitt, no 2, 2001.

Matematikens dubbelnatur – undflyende innehåll och självtillräckligt språk, Utbildning och Demokrati, no 2, 2005.

An Evolutionary Text Book – Evolving by Student Activity, Jou. of On-line Math. vol. 7, 2007.

3.3 Conference publications and other scientific publications

Mathematics, computer science, electronic imaging

The Dirichlet problem in Lipschitz crack domains, Department of mathematics, CTH, 1986.

Thesis: *Duality of the Neumann and Dirichlet problems for the Laplace equation in non-smooth domains*, CTH, 1989.

An optimal upper bound on the minimal completion time in distributed supercomputing, with Lars Lundberg, International Conference on Supercomputing, pp. 196-203, 1994.

An Optimal Lower Bound on the Maximum Speedup in Multiprocessors with Clusters, with L. Lundberg, in Proceedings of the first International Conference on Algorithms and Architectures for Parallel Processing 1995, April, Brisbane, Australia, pp. 640-649.

An optimal bound on the gain of using one large processor cluster instead of a number of small clusters, with Lars Lundberg, Proceedings of the ISCA International Conference on Parallel and Distributed Computing Systems, Orlando, FL, 21-23 Sept 1995.

Combinatorics for Multiprocessor Scheduling Optimization and Other Contexts in Computer Architecture, with Lars Lundberg, Combinatorics and Computer Science 1995, pp. 341-347. 1995, also in Lecture Notes in Computer Science, Springer Verlag 1996.

Optimal scheduling results for parallel computing, with Lars Lundberg, survey article, SIAM News, Vol. 27, No. 7, 1994. Also in the volume Applications on Advanced Computer Architecture, editor: Greg Astfalk, SIAM, 1996.

Combinatorial formulas for optimal cache memory efficiency, with Lars Lundberg, översiktsartikel, SIAM News, Vol. 29, No 6, July/August 1996.

Optimal Bounds on the Gain of Permitting Dynamic Allocation of Communication Channels in Distributed with Lars Lundberg, Processing. OPODIS, pp. 29-44, 1997.

The directional display, Stereoscopic Displays and Virtual Reality Systems IV, editors: Scott S. Fischer, John O. Merritt, Mark T. Bolas, Proc. of SPIE, Vol. 3012, May 1997.

Comparing the Optimal Performance of Different MIMD Multiprocessor Architectures, with Lars Lundberg, IPPS/SPDP, pp. 498-502, 1998.

Optimal Performance Comparisons for Massively Parallel Multiprocessors, with Lars Lundberg, Colloque LaCIM 2000, Combinatoire, Informatique en Applications, Montreal, 2000.

Theoretical Framework for Optimal Scheduling, with Lars Lundberg, Proceedings of SPECTS-01, Orlando, Florida, July, 2001.

Using Golumb rulers for optimal recovery schemes in fault tolerant distributed computing, with Lars Lundberg, Kamilla Klonowska, Annual IEEE Workshop on Fault-Tolerant Parallel and Distributed Systems, IPDPS 2003, France, 2003.

Comparing the Optimal Performance of Multiprocessor Architectures, with Lars Lundberg, Kamilla Klonowska, Magnus Broberg, Applied Informatics, pp. 750-760, 2003.

Global Multiprocessor Scheduling of Aperiodic Tasks using Time-Independent Priorities, with Lars Lundberg, 9th IEEE Real-time Technology and Applications Symposium, Toronto, Canada, pp. 170-180, 2003.

Using modulo rulers for optimal recovery schemes in fault tolerant distributed computing, with Lars Lundberg, Kamilla Klonowska, Charlie Svahnberg, Proceedings of the 10th International Symposium PRDC 2004, Papeete, Tahiti, pp. 133-142, 2004.

Using Optimal Golomb Rulers for Minimizing Collisions in Closed Hashing, with Lars Lundberg, Kamilla Klonowska, Göran Gustafsson, ASIAN 2004: 157-168.

Extended Golomb Rulers as the New Recovery Schemes in Distributed Dependable Computing, with Kamilla Klonowska, Lars Lundberg, Charlie Svahnberg, in proceedings of IPDPS, Denver, Colorado, 2005.

Improved Upper Bound on the Minimum Euclidean Distance for Block Coded Phase Shift Keying, with Magnus Nilsson, in proceedings of RVK05, Linköping, Sweden, 2005.

A two-metric Approach to Improve Bounds on the Minimum Euclidean Distance for Block Codes, with Magnus Nilsson and Efraim Laksman, in proceedings of RVK08, Linköping, Sweden, 2008.

Slack-based global multiprocessor scheduling of aperiodic tasks in parallel embedded real-time systems, in proceedings of Computer Systems and Applications, AICCSA 2008, pp 465-472, with Lars Lundberg

Inner Metric Bounds on the Minimal Euclidean Distance for Arbitrary q-ary Block Codes, with Magnus Nilsson and Efraim Laksman, in proceedings of the 9th International Conference on Finite Fields and their Applications, Dublin, Ireland, 2009.

Local Linear Time Convergence of Primal-Dual Energy Minimization Algorithm for Parallel Processing, ISPCD 2014: 135-139, 2014.

Utilization-Based Schedulability Test of Real-Time Systems on Virtual Multiprocessors, med C. Niyizamwiyitira, L. Lundberg, ICPP Workshops 2015.

Mathematics education

On the irrational component in mathematics learning, Proceedings från 8th SEFI Seminar, Prag 1995.

Läroböcker bör vara student-lärardialoger, with Eva Pettersson, Women and mathematics, Uppsala, 1999.

Matematiska dialoger som söker efter mening och samtidigt demonstrerar upptäckandeprocessen, proceedings from research seminar in mathematics didactics, Luleå, 2001.

Dialogues as a tool for decoding mathematics, SEFI Seminar, Köpenhamn, 2001.

Mathematish – a Tacit Knowledge of Mathematics, with Lars Mouwitz, proceedings of MADIF4, Malmö, Sweden, 2004.

Completing Mathematics by Student and Teacher Reflection, proceedings of MADIF5, Stockholm, Sweden, 2006.

Spectrums of knowledge types – mathematics, mathematics education and praxis knowledge, proceedings of MADIF6, Stockholm, Sweden, 2008.

Mathematical maps - students working with geography as a global metaphor for mathematics, proceedings of MADIF7, Stockholm, Sweden, 2010.

The periodic system of mathematics, the 15th SEFI MWG seminar and 8th Workshop GFC Mathematical Education of Engineers, Wismar, Germany, 20-23 June, 2010.

Åtta IKT-projekt för matematiken i skolan – empiri och analys, med C. Olteanu, Report no 2012:02, Blekinge Tekniska Högskola.

Visualizing tacit knowledge of mathematics in education, research and engineering, 3rd International Symposium on Integrating Research, Education, and Problem Solving (IREPS 2013), Florida, USA, Juli 2013.

3.4 Further articles on mathematical education

Om problemlösning och människans osynlighet i matematikämnet, Nämnaren, no.1 1995.

Matematikutbildning - ett möte mellan två kulturer, Nämnaren no 4, 1999, special issue.

Pedagogiska reformer kan göras med små medel, Universitetsläraren, no 18, 2000.

Matematikutbildning och matematikens två komponenter: innehåll och språk, member journal for the Swedish Mathematical Society, 2002.

Svar till Ulf Perssons kommentar "Matematik: innehåll och språk", member journal for the Swedish Mathematical Society, 2003.

Två debatter angående matematikens innehåll och språk, CTH och KTH, with Ulf Persson, member journal for the Swedish Society for Mathematics Didactics, 2003.

Matematikkartor, med Krister Larsson, Nämnaren no 3, 2003.

Översättningar matematiska/svenska kan leda in i matematiken, invited presentation at Naturvetardagarna, University of Uppsala, 2003.

Innebörden hos "=" – en sista debattkommentar om innehåll och språk, member journal for the Swedish Mathematical Society, 2004.

Klass 9A:s matematikkarta, with Mia Selander, Nämnaren, no 2, 2004.

Matematik som filosofiämne, Nämnaren, no 2, 2004.

Matematikens språk – verb och substantiv, with Ann-Louise Ljungblad, Specialpedagogik, no 4, 2007.

Hur rund är en kvadrat? Nämnaren, no. 1, 2013.

Hitta de superrika talen, Nämnaren, no. 2 2013.

Hur rund är en kvadrat?, Nämnaren no 1 2013.

Falta tärningarna! Nämnaren, no 1, 2014.

Att köa, Nämnaren, no 4, 2015.

4. Further publication

4.1 Books

1. *Serier och transformers*, (244 pages), with Claes Jogr eus, BTH, 1998, Studentlitteratur AB, Lund, Sweden.
2. *Envariabelanalys med dialoger*, (754 pages), K rret, 2002.
Grafik, matematikkarta: *Karta  fver envariabelanalys*.
3. *Envariabelanalys, id er och kalkyler*, (641 pages), Liber, 2005.
4. *Matematiska spr k*, (141 pages), ed., with Christer Bergsten, Sant rus F rlag, 2008.
5. *In production: Flervariabelanalys, id er och kalkyler*, Liber F rlag.
6. *Matematik och respekt – matematikens m ngfald och lyssnandets konst*, A-L Ljungblad och H. Lennerstad, Liber F rlag.
7. *Matematik och respekt – i praktiken*, H. Lennerstad och A-L Ljungblad, Liber F rlag.

4.2. Articles in popular mathematics

- Game of life - spelet som ber r fundamentala livsfr gor*, Elementa, No 2, 1996.
- Addition, multiplikation, ...*, Elementa, No 2, 1997.
- Andragradsekvationen som n ldyna*, Elementa, No 3, 1998.
- Matematikutbildning – m te mellan tv  kulturer*, N mnaren, No 4, 1999.
- En annan addition och Stern-Brocots tr d*, med Lars Lundberg, N mnaren, no 3, 2006.
- Metatrianglar – trianglar med  gon*, N mnaren, no 3, 2009.

4.3. Graphics in mathematics – mathematical posters

- Envariabelanalys – en matematikkarta*, 2001
- Calculus in one variable – a mathematics map*, 2003
- Stern-Brocot tree of all rationals a/b – with branch height as $a + b$* , 2005
- Stern-Brocot tree – a discrete linear algebra application*, 2005
- Periodiska systemet f r matematiska funktioner*, 2008

5. Pedagogical merits

year

5.1 Teaching

	Volume, hours	year
During undergraduate education		
Assistant teacher, mathematical physics, first and second course	150	73 - 75
Assistant teacher, mathematics, as M. Sc.	186	78, 81 - 82
During graduate education		
Assistant teacher, mathematics, as graduate student	730	83 - 89
As Ph.D. and as lecturer		
Linear Algebra		
3 x Calculus		
2 x Calculus, with student's mathematical dialogues as assignments		
3 x Calculus in Several Variables		
4x Transform theory		
3x Distance course in Calculus		
2x Distance course in Transform Theory		
2 x Linear algebra and Optimization		
Fourier Analysis and Applied Fourier Analysis		
6 x Discrete Mathematics		
Mathematical statistics		
2 x Analytic functions, Numerical linear algebra		
Partial differential equations		
Optimization, for researchers in signal processing		
Potential theory, for engineers at Asea Brown Boverly		
Graduate courses		
Functional analysis, graduate course		
Fractal geometry - foundations and applications		
2x Advanced discrete mathematics		
Dialogue seminar course, university pedagogics: <i>Matematiken i ingenjörutbildningarna</i> – 5 points		06
Dialogue seminar course, university pedagogics: <i>Teaching mathematics and technology</i> – 5 points		08

5.2 Pedagogics education (5 points = 7.5 university points)

As student: University didactics – scientific advising – 5 points.		04
Leader of dialogue seminar course, university pedagogics: <i>Matematiken i ingenjörutbildningarna</i>		06
Leader of dialogue seminar course, university pedagogics: <i>Teaching mathematics and technology</i>		08

5.3 Undergraduate supervising

Teachers degree theses at Malmö University during 2002

Matte utan bok, inga problem!, Anna-Lena Andersson, Fredrik Bengtsson.

Hur kan man introducera derivatabegreppet i matematikundervisningen? Anders Söderberg.

Matematik – att vinna eller försvinna?, Sanela Mehanovic.

Matematikundervisning, Nadia Fontes.

Huvudräkning, Anna Nordström.

Matematikundervisning i skolår 7-9, Maria Johansson, Evy Öst.

Masters degree thesis at BTH:

Software Reliability Prediction, an evaluation of a novel approach, Björn Andersson, Marie Persson, BTH, 2004.

Pilot study: Modeling of wildfires, Rickard Hansen, BTH, 2008.

An Instance based Approach to Find the Types of Correspondence between the Attributes of Heterogeneous Datasets av Sameer Munir och Mohammad Atif Riez, BTH, 2012.

An Investigation of Gossiping Protocols and Network Entropy av Mohsen Taghavianfar, BTH, 2013.

5. Other commissions and merits

year

Initiatives for conferences, workshops, scientific debates

Organizer, with Claes Jogr eus, of educational day of the Swedish Mathematical Society, Karlskrona. 94

Organizer of conference “Ideas and language in mathematics education“, Malm . 01

Debates on language and content in mathematics,
with Ulf Persson, professor in mathematics, CTH & KTH. 03

Grant from the Council for the renewal of Higher Education: *Student influence on text books*, July 03 – June 04, total budget: 534 000 SEK (report at http://www.rhu.se/activities/projects/financed_projects/k-lennerstad_hakan_G02.htm#top). 03/04

Member of working group “Arbetsliv, Bildning, Demokrati, Samh lle”, for the Mathematics Delegation. 03/04

Leader of Workshop Mathematics and Democracy as part of Dialogue Seminar “Det matematiska kulturarvet”, March 21-22, 2004. 04

Commission for the Faculty club as organizer of seminar series “M ten mellan kunskaper“ at BTH, 2004. A seminar series crossing the borders between the sciences. At present five seminars by researchers in literature (Anna Forssberg-Malm), mathematics (H kan Lennerstad), signal processing (Ingvar Claesson), health (Ylva Hellstr m), computer science (Rune Gustavsson) philosophy (Bertil Rolf), management (Joakim Appelkvist), economy (Peter Stevrin). 04

Organizer of dialogue seminar course * vers ttningar matematiska-svenska* for elementary teachers, with Pi H gdahl, reported by  sa Ericsson, Carina S derstr m, *Dialogseminarium i matematiska, vad kan det ge yrkesverksamma l rare?* 04,05

Organizer of “Utbildningsdagarna” of the Swedish Mathematical Society, KTH. 05

Organizer of conference: “Matematikens formelspr k en barri r eller kommunikationsmedel?” of the Swedish Mathematical Society, SMAL and SMDF, with Christer Bergsten, KTH. 05

Organizer of “Musical and Philosophical Dialogue Seminar”, BTH, 6-7 Dec. 06

Organizer of “Dialoger om musik och matematik”, Lyck  Kammarmusikfestival, July, 07

Organizer of exhibition “Ikonisk matematik”, Blekinge museum, Oct 5 – Nov 8, 08