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Curriculum vitae

Surname:	Karlström
First name:	Karl Anders Olof
Date and place of birth:	April 16, 1958 in Eskilstuna, Sweden
Nationality/Citizenship:	Swedish
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Educational background

- 1981: MSc in Chemical Engineering, the Royal Institute of Technology, Stockholm, Sweden.
- 1989: Lic. in Control Engineering, the school of Electrical Engineering, Chalmers University of Technology, Gothenburg, Sweden.
- 1991: PhD in Control Engineering, the school of Electrical Engineering, Chalmers University of Technology.
- 1997: Associate professor in Control Engineering at Chalmers University of Technology. The focus has been on new complex automation solutions to known problems in order to reduce investments, increase efficiency and improve quality and reliability. Special emphasize on future multi-sensor structures necessary for research and the coming IT solutions in the chemical industry.
- 2011: Adjunct professor, Department of Signals and Systems at Chalmers University of Technology.

Positions

- 1981-1987: Employed by ESSO Chemicals (Europe) as a project manager. Specialty - larger implementations of new process computer concept worldwide based on a Honeywell platform (Oil industry).
- 1987-1991: PhD student at Chalmers university of Technology.
- 1991-1993: Manager of System Engineering at MoDo (Pulp and paper industry).
- 1993-1995: Manager of Research and Development (Newsprint) MoDo (Pulp and paper industry).
- 1995-1998: Managing director of the centre of excellence in internal combustion engine research, Chalmers University of Technology. The centre was one of 28 in Sweden financed by the Swedish Agency for Innovation Systems (VINNOVA) and the Swedish Energy Agency (STEM).

- 1998-1999: Managing director for the centre of excellence in high-speed electronics and photonics financed by VINNOVA and at the same time started the new centre of excellence in chemical process control and design at Chalmers and Lund University of Technology financed by the Swedish Foundation for Strategic Research.
- 2000- 2013: President of Stiftelsen Chalmers Industriteknik (CIT) and chairman of the board in seven subsidiary companies.
- 2007- 2013: Chairman of the board for EnMesh AB, a company specialized on development of the next generation of software for real-time simulations.
- 2007 – 2012: Member of the board; Chalmers Intellectual Property Rights AB.
- 2011 – Member of the advisory board, Noor Capital Holding AB.

Public assignments

- 2007- Institute of Management of Innovation and Technology. Trustee appointed by Chalmers University of Technology.
- 2007- Department of Technology Management and Economics (Chalmers) - Member of the department council.
- 2008- 2012: CHASE/Chalmers Antenna Systems Excellence center - Chairman of the board.
- 2009- Board member MedTech West.
- 2009- Department of Fundamental Physics (Chalmers). Chairman of the department council.
- 2015- Department of Applied Physics (Chalmers), Member of the department council.

Supervisor for graduate students

- Fredrik Rosenqvist – Direction dependent processes – Theory and application. PhD-dissertation 2004.
- Karin Eriksson – An Entropy-based Modeling Approach to Internally Interconnected TMP Refining Processes. Licentiate thesis 2005.
- Karin Eriksson – Towards Improved Control of TMP Refining Processes. PhD-dissertation 2009.
- Daniel Berg – A Comprehensive Approach to Modeling and Control of Thermomechanical Pulping Processes. Licentiate thesis 2005.
- David Sikter- Quality Control of a Newsprint TMP Refining Process based on Refining Zone Temperature Measurements. Licentiate thesis 2007.

Additional information

- Involved in several activities besides the research in different fields of control engineering. Some of the positions in the academy:
- Teacher in the PhD-program “Mechanical Pulping Technology – Refining and Control Theory” at Mid Sweden University, 2004-2009.
- Research leader for a program within the VINNOVA financed project “Filling the Gap” at Mid Sweden University, 2009-2013.

- One of the initiators of Chalmers Energy Center. Nowadays included in the Energy - Chalmers Area of Advance;
- Established organization and working platform for validation of commercial applications based on research results from the MISTRA program "Urban Water Management".
- International cooperation together with Onsala Space Observatory aiming at advanced development of mixers and amplifiers for the ALMA (Atacama Large Millimeter Array) project in Chile, run by Southern European Observatory;
- Initiated start-up of the center in real-time QPCR at Lundberg Laboratory;
- Promoted the research related innovation system at Chalmers. Idea; Capture and develop research-findings in early stages to achieve a better ”pay-off” of research investments via validation before a commercial service or product can be formulated;
- Initiated different projects where competences at Chalmers were directly utilized in development processes related to industry and commerce.
- Involved in the European network established to initiate the “Graphene Flagship” with Chalmers as an important node in Europe.
- Involved in a number of EU-financed research projects together with international institutes and universities as well as European companies.

Publication List

Relevant for the position,

1. Karlström, A.(1991),”An improved SRK-equation for the estimation of concentrations by inferential measurements”, *Chem. Eng. Technology* 14, 20-28.
2. Molander M., Karlström A.(1991), “Model reduction by means of physical considerations in a packed bed distillation column”. *European Control Conference 1991*.
3. Karlström, Anders; Breitholtz, Claes (1991) “Model Order Reduction for Packed Bed Distillation Columns”. *Proc of the 1st European Control Conference, Grenoble, France*.
4. Karlström, A., Breitholtz, C., (1992), “Experimental Validation of a Packed Bed Distillation Model”, *Chemical Engineering Technology,* 15 (6) pp. 406 – 416.
5. Karlström A., Breitholtz C, Molander M.(1992),”Heat, mass and momentum transfer in packed bed distillation columns”, *Chem. Eng. Technology* 15 (1992) 1-10.
6. Karlström A., Breitholtz C., Jovik I., Lagerberg A., (1992), ”Control system design in distillation processes and its dependence of the original process design”, *In Proc of 1st IFAC workshop on interaction between process design and process control, London, UK.*
7. Karlström A., Koebe M. (1993),” Modeling of wood-chip refining processes”, *Nordic Pulp and Paper Research Journal, 8(4) p 384-388.*
8. Engstrand P., Karlström A., Nilsson L., (1995),”The impact of chemical addition on refining parameters”, *International Mechanical Pulping Conference, p 281-286, Ottawa.*
9. Allison B., Isaksson A., Karlström A. (1995),”Grey-Box identification of a TMP refiner”, *International Mechanical Pulping Conference, p 119-124, Ottawa.*
10. Allison B., Isaksson A., Karlström A. (1996),”Distributed parameter process model of a chip refiner”, *Control Systems Conference, p 113-116, Halifax.*
11. Horch A., Isaksson A., Allison B., Karlström A., Nilsson L. (1997),”Dynamic simulation of a thermomechanical pulp refiner”, *Nordic Pulp and Paper Journal 12(4) p270-275, 1997.*
12. Burgdorf K., Karlström A. (1997),”Using multi-rate filter banks to detect internal combustion engine knock”, *SAE paper 971670.*

13. Gjirja S., Olsson E., Karlström A.(1998),"Considerations on engine diesel and fuelling technique effects on qualitative combustion in alcohol diesel engines", *SAE international fall fuels and lubricants meeting, Paper 98FL-322, San Fransisco, Oct 1998.*
14. Gjirja S., Olsson E., Karlström A.(1998),"Ether fumigation, a new alternative for the neat ethanol diesel engine", *Paper No 98EL008, Int. Conf. Proceedings 31st ISATA,* Clean power Sources and Fuels. *Special innovative conference: Intelligent transportation systems, Dusseldorf 1998.*
15. Gjirja S., Olsson E., Karlström A. (1999),"Investigations on methanol engine with DME fumigation", *Paper 99CPE007, 32nd ISATA, June Vienna 1999.*
16. Lundström D., Karlström A.(1999),"Transient identification using a fractional derivative model", *European Control Conference ECC99, Karlsruhe.*
17. Rafeef A., Persson J., Försth, M, Rosén A., Karlström A., Gustavsson T. (2000),"Compensation method for attenuated planar laser images of optically dense sprays", *Applied optics Vol. 39, No. 8, 2000.*
18. Rosenqvist, F., Eriksson K., Karlström A.(2001),"Time-variant modeling of TMP refining", *IEEE IAS Workshop on Advanced Process Control, p 37-42 Vancouver May 2001.*
19. Rosenqvist, F., Eriksson K., Karlström A.(2001),"Modelling a thermomechanical wood-chip refiner", *IASTED Modelling, Identification and Control, Innsbruck, Austria, pp- 763-768, 2001*.
20. *Rosenqvist F., Karlström A., Eriksson K. (2002),"Parameter* estimation in processes with direction-dependent dynamics", *3rd International Conference on Identification in Engineering Systems, Swansea, April 2002.*
21. Rosenqvist F., Berg D.., Karlström A., Eriksson K., Breitholtz C., (2002),"Internal Interconnections in TMP refining", *Proc. Of IEEE Conference on Control Applications, Glascow, UK.*
22. Eriksson K., Karlström A., Rosenqvist F., Berg D.(2002),"The impact of different input variables in a Twin disc refiner line", *Control Systems Conference, p229-233, Stockholm.*
23. Rosenqvist F., Karlström A. (2003),"Controllability of direction dependent processes", *Conference of Decision and Control, Hawaii 2003.*
24. Rosenqvist F., Karlström A. (2003),"Piecewise-linear output-error models", *Symposium on System Identification, IFAC, Rotterdam, The Netherlands.*
25. Berg D., Karlström A., Gustavsson M. (2003),"Deterministic consistency estimation in refining processes", *International Mechanical Pulping Conference, p 361-366 Quebec City June 2003.*
26. Berg D., Karlström A.(2004),"Approach to 3x3 decoupling and control of thermo-mechanical pulp refiners", *IEEE IAS Workshop on Advanced Process Control, Vancouver April 2004.*
27. Rosenqvist F., Karlström A. (2004),"Piecewise-linear output-error methods for parameter estimation in direction-dependent processes", *Proc. Hybrid Systems, Computation and Control, Pennsylvania, March 2004.*
28. Rosenqvist F., Karlström A. (2004),"Piecewise-linear output-error methods for parameter estimation in direction-dependent processes", *In Alur an G. J. Pappas (eds), Hybrid Systems: Computation and Control, Lecture notes in Computer Science. Vol. 2993, Springer Verlag, pp. 493-507.*
29. Rosenqvist F., Karlström A. (2005),"Realization and estimation of piecewise-linear output-error models", *Automatica 2005, Vol. 41, pp. 545-551.*

30. Karlström A., Berg D., Eriksson K. (2005), ”Developments in soft sensors for measurement of refining parameters”. *Proc. PIRA 2005, Barcelona.*
31. Berg D., Karlström A., (2005), “Dynamic pressure measurements in full-scale thermomechanical pulp refiners”, *International Mechanical Pulping Conference, pp. 42-49, Oslo, Norway.*
32. Rosenqvist F., Tan A.H., Godfrey K., Karlström A. (2006), ”Direction-Dependent System Modeling Approaches Exemplified Through an Electronic Nose System”, *IEEE Transactions on Control Systems Technology, vol. 14,No. 3,May 2006.*
33. Sikter D., Karlström A., Engstrand P., Czmaidalka J. (2007), ”Using the Refining Zone Temperature Profile for Quality Control”. *International Mechanical Pulping Conference, Minneapolis June 2007.*
34. Karlström A., Sikter D., Gustavsson M. (2007), ”Plate Gap Estimation based on Physical Refining Measurements”. *International Mechanical Pulping Conference, Minneapolis June 2007.*
35. Sikter D., Karlström A., Sandberg C., Engstrand P. (2008),“Economic perspectives on quality control in TMP refining processes”, *Nordic Pulp and Paper Journal.*
36. Karlström A., Eriksson K., Sikter D., Gustavsson M. (2008),“Refining Models for Control Purposes”, *Nordic Pulp and Paper Journal, Vol. 1, pp. 129-138.*
37. Eriksson K., Karlström A.,(2009)”Modeling approaches for critical process limitations in the operation of thermomechanical pulp refiners”, *Nordic Pulp and Paper Journal, Vol. 24, pp. 231-238.*
38. Eriksson K., Karlström A.,(2009)”Refining zone temperature control: A good choice for pulp quality control”, *International Mechanical Pulping Conference, Sundsvall, Sweden.*
39. Eriksson, K., Karlström, A., Breitholtz, C. (2009) “Internal interconnections impact on control performance in a thermomechanical pulping process”. *Proceedings of the European Control Conference, Budapest, Hungary*.
40. Eriksson, K., Breitholtz, C., Karlström, A. (2009), “A note on decoupling”. *Proceedings 15th Nordic Process Control Workshop*, pp. 36-37.
41. Karlström A., Isaksson A., (2009)”Multi-rate optimal control of the TMP-refining processes”, *International Mechanical Pulping Conference, Sundsvall, Sweden.*
42. Eriksson, K., and Karlström, A. (2009) Modeling approaches for critical process limitations in the operation of thermomechanical pulp refiners”, *Nordic Pulp and Paper Research Journal*, 24(2), 231-238.
43. Eriksson, K., Karlström, A., and Ledung, L. (2010). Controlling TMP refiner lines using pre-specified operating windows, Control Systems Conference, Stockholm, Sweden.
44. Karlström, A. (2013) Multi-scale modeling in TMP-processes, 8th Int. Fundamental Mech. Pulp Res. Seminar, Åre, Sweden.
45. Karlström, A. and Eriksson, K. (2014a): Fiber energy efficiency Part I: Extended entropy model. Nord. Pulp Paper Res. J. 29(2).
46. Karlström, A. and Eriksson, K. (2014b): Fiber energy efficiency Part II: Forces acting on the refiner bars. Nord. Pulp Paper Res. J. 29(2).
47. Karlström, A. and Eriksson, K. (2014a): Refining energy efficiency Part I: Extended entropy model. Nord. Pulp Paper Res. J. 29(2).
48. Karlström, A. and Eriksson, K. (2014b): Refining energy efficiency Part II: Forces acting on the refining bars. Nord. Pulp Paper Res. J. 29(2).
49. Karlström, A. and Eriksson, K. (2014c): Refining energy efficiency Part III: Modeling of fiber-to-bar interaction. Nord. Pulp Paper Res. J. 29(3)

50. Karlström, A. and Eriksson, K. (2014d): Refining energy efficiency Part IV: Multi-scale modeling of refining processes. Nord. Pulp Paper Res. J. 29(3).
51. Karlström, A. and Hill J. (2014a): Refiner Optimization and Control Part I: Fiber residence time and major dynamic fluctuations in TMP refining processes. Nord. Pulp Paper Res. J. 29(4).
52. Karlström, A. and Hill J. (2014b): Refiner Optimization and Control Part II: Test procedures for describing dynamics in TMP refining processes. Nord. Pulp Paper Res. J. 29(4)
53. Karlström, A. and Hill J. (2015a): Refiner Optimization and Control Part III: Natural decoupling in TMP refining processes. Nord. Pulp Paper Res. J. 30(3).
54. Karlström, A., Eriksson, K. and Hill J. (2015b): Refiner Optimization and Control Part IV: Long term follow up of control performance in TMP processes. Nord. Pulp Paper Res. J. 30(3).
55. Karlström, A., Hill J., Ferritsius, R. and Ferritsius, O. (2015a): Pulp Property Development Part I: Interlacing Undersampled Pulp Properties and TMP Process Data using Piece-wise Linear Functions. Accepted for publication in Nord. Pulp Paper Res. J.
56. Karlström, A., Hill J., Ferritsius, R. and Ferritsius, O. (2015b): Pulp Property Development Part II: Process Nonlinearities and its Influence on Pulp Property Development. Submitted for publication in Nord. Pulp Paper Res. J.
57. Karlström, A., Hill J., Ferritsius, R. and Ferritsius, O. (2015c): Pulp Property Development Part III: Fiber Residence Time and Consistency Profile Impact on Specific Energy and Pulp Properties. Submitted for publication in Nord. Pulp Paper Res. J.

Patents(Info from esp@cenet, selected filed patents)

1) SE9301325 (A) - 1994-10-22; ”ANORDNING FÖR KONTROLL AV DEFEKTER PÅ PLAN BANA”

2) CA2204240 (A1) - 1996-05-17; “SYSTEM FOR CONTINUOUSLY MEASURING PRESSURE AND TEMPERATURE IN THE BEATING ZONE OF REFINERS”

3) NO971970 (A) - 1997-06-06; ”SYSTEM FOR CONTINUOUSLY MEASURING PRESSURE AND TEMPERATURE IN THE BEATING ZONE OF REFINERS”

4) WO9848936 (A1) - 1998-11-05; “DEVICE FOR INVESTIGATING THE GRINDING PROCESS IN A REFINER INCLUDING SENSORS”

5) WO9858243 (A1) - 1998-12-23; “METHOD FOR MEASURING THE CONCENTRATION OF CELLULOSE MATERIAL IN A WATER SUSPENSION DURING BEATING OF WOOD CHIPS AND ARRANGEMENT FOR PERFORMING THE METHOD”

6) US6024309 (A) - 2000-02-15; “METHOD FOR GUIDING THE BEATING IN A REFINER AND ARRANGEMENT FOR PERFORMING THE METHOD”

7) SE0502784(A) – 2007-06-17;”SYSTEM FÖR ATT BERÄKNA MALSPALT I RAFFINÖRER MEDELST SPATIAL TEMPERATUR-OCH TRYCKMÄTNING I MALZONER”

8) US2008006146;”LIGHT BALLISTIC PROTECTION AS BUILDING ELEMENTS”

Patents and Patent Applications (PRV information not available from esp@cenet)

1) SE0900572-9 – APRIL 2009; ”FÖRFARANDE FÖR ATT STYRA PROCESSBETINGELSER I RAFFINÖRER FÖR ATT FÖRHINDRA FIBERKLIPPNING OCH HAVERI AV MALSEGMENT”. PCT approved.

2) SE0900916-8 – JULI 2009; ”FÖRFARANDE FÖR ATT MINIMERA SKILLNADEN MELLAN TEMPERATURPROFILER I RAFFINÖRER MED TVÅ MALZONER”. PCT approved.

3) SE 534 105 C2 - ”FÖRFARANDE FÖR ATT STYRA MASSAKVALITET UT FRÅN RAFFINÖRER”. PCT approved.

4) PATENTAPPLICATION;”FÖRFARANDE FÖR ATT MÄTA OCH BALANSERA OJÄMNHETER I RAFFINÖRER”.Nedlagd

5) SE1000668-2 - Förfarande för att styra massakvalitet ut från raffinörer vid varierande råvarublandningar. PRV handläggning.

References

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