Curriculum Vitae

Martin Enqvist

2017-03-20

Personal information

Born: August 31, 1976 in Lund, Sweden.

Office address: Department of Electrical Engineering, Linköping University, SE-581 83 Linköping, Sweden.

Contact info: Phone (office): +46 13 281393, Mobile (private): +46 70 6929114, E-mail: `maren_at_isy.liu.se`

Academic titles

Docent in Automatic Control, Linköping University, Sweden. March 2012.

Academic degrees

Doctor of Philosophy (Teknologie doktor) in Automatic Control, Linköping University, Sweden. December 2005.

Licentiate of Engineering (Teknologie licentiat) in Automatic Control, Linköping University, Sweden. October 2003.

Master of Science (Civilingenjör) in Applied Physics and Electrical Engineering, Linköping University, Sweden. Branch of studies: Applied Mathematics. December 2000.

Employments

Associate professor (Universitetslektor) in Automatic Control at the Department of Electrical Engineering, Linköping University, Sweden. Since September 2008.

Research associate (Forskarassistent) in Automatic Control at the Department of Electrical Engineering, Linköping University, Sweden. January 2007 – September 2008.

Postdoc researcher at the ELEC department, Vrije Universiteit Brussel, Belgium. January – December 2006.

PhD student in Automatic Control at the Department of Electrical Engineering, Linköping University, Sweden. Supervisor: Prof. Lennart Ljung. December 2000 – December 2005.

Project employee (MSc thesis) at NIRA Automotive AB, Linköping, Sweden. June – November 2000.

Teaching assistant in Automatic Control at the Department of Electrical Engineering, Linköping University, Sweden. July 1999 – June 2000.

Teaching assistant in Introductory Mathematics at the Department of Mathematics, Linköping University, Sweden. August 1997 and August 1998.

Employee at Elfa AB, Linköping, Sweden. July – August 1997 and June – August 1998.

Publications

Theses

[T3] M. Enqvist. *Linear Models of Nonlinear Systems*. PhD thesis, Linköping University, Linköping, Sweden, 2005

[T2] M. Enqvist. Some results on linear models of nonlinear systems. Licentiate's thesis no. 1046, Department of Electrical Engineering, Linköping University, Linköping, Sweden, 2003

[T1] M. Enqvist. Aspects of high precision estimation of vehicle dynamics. Master's thesis LiTH-ISY-EX-3116, Department of Electrical Engineering, Linköping University, Linköping, Sweden, 2000

Book chapters

[BC1] M. Enqvist. Identification of block-oriented systems using the invariance property. In F. Giri and E.-W. Bai, editors, *Block-oriented Nonlinear System Identification*, pages 147–158. Springer, Berlin Heidelberg, 2010

Papers in refereed scientific journals

[J9] J. Linder and M. Enqvist. Identification of systems with unknown inputs using indirect input measurements. *International Journal of Control*, 90(4): 729–745, 2017

[J8] J. Escobar and M. Enqvist. Instrumental variables and LSM in continuous-time parameter estimation. *ESAIM: Control, Optimisation and Calculus of Variations*, 23(2):427–442, 2017

[J7] Y. Jung, J. Fritzin, M. Enqvist, and A. Alvandpour. Least-squares phase predistortion of a +30 dBm class-D outphasing RF PA in 65 nm CMOS. *IEEE Transactions on Circuits and Systems—Part I: Regular Papers*, 60(7):1915–1928, 2013

[J6] J. Fritzin, Y. Jung, P. N. Landin, P. Händel, M. Enqvist, and A. Alvandpour. Phase predistortion of a class-D outphasing RF amplifier in 90nm CMOS. *IEEE Transactions on Circuits and Systems—Part II: Express Briefs*, 58(10):642–646, 2011

[J5] C. Lyzell, T. Glad, M. Enqvist, and L. Ljung. Difference algebra and system identification. *Automatica*, 47(9):1896–1904, 2011

[J4] M. Enqvist. Separability of scalar random multisine signals. *Automatica*, 47(9):1860–1867, 2011

[J3] L. Lauwers, J. Schoukens, R. Pintelon, and M. Enqvist. A nonlinear block structure identification procedure using frequency response function measurements. *IEEE Transactions on Instrumentation and Measurement*, 57(10):2257–2264, 2008

[J2] J. Schoukens, R. Pintelon, and M. Enqvist. Study of the LTI relations between the outputs of two coupled Wiener systems and its application to the generation of initial estimates for Wiener-Hammerstein systems. *Automatica*, 44(7):1654–1665, 2008

[J1] M. Enqvist and L. Ljung. Linear approximations of nonlinear FIR systems for separable input processes. *Automatica*, 41(3):459–473, 2005

Papers at refereed scientific conferences

[C30] Y. Jung and M. Enqvist. On estimation of approximate inverse models of block-oriented systems. In *Proceedings of the 17th IFAC Symposium on System Identification*, pages 1226–1231, Beijing, China, October 2015

[C29] J. Linder and M. Enqvist. On indirect input measurements. In *Proceedings of the 17th IFAC Symposium on System Identification*, pages 104–109, Beijing, China, October 2015

[C28] J. Linder, M. Enqvist, T. I. Fossen, T. A. Johansen, and F. Gustafsson. Online estimation of ship's mass and center of mass using inertial measurements. In *Proceedings of the 10th IFAC Conference on Manoeuvring and Control of Marine Craft*, Copenhagen, Denmark, August 2015

[C27] J. Linder, M. Enqvist, T. I. Fossen, T. A. Johansen, and F. Gustafsson. Modeling for IMU-based online estimation of a ship's mass and center of mass. In *Proceedings of the 10th IFAC Conference on Manoeuvring and Control of Marine Craft*, Copenhagen, Denmark, August 2015

[C26] J. Linder, M. Enqvist, and F. Gustafsson. A closed-loop instrumental variable approach to mass and center of mass estimation using IMU data. In *Proceedings of the 53rd IEEE Conference on Decision and Control*, pages 283–289, Los Angeles, California, December 2014

[C25] M. Sadeghi Reineh, M. Enqvist, and F. Gustafsson. IMU-based vehicle load estimation under normal driving conditions. In *Proceedings of the 53rd IEEE Conference on Decision and Control*, pages 3376–3381, Los Angeles, California, December 2014

[C24] J. Linder, M. Enqvist, F. Gustafsson, and J. Sjöberg. Identifiability of physical parameters in systems with limited sensors. In *Proceedings of the 19th IFAC World Congress*, pages 6454–6459, Cape Town, South Africa, August 2014

[C23] Y. Jung and M. Enqvist. Estimating models of inverse systems. In *Proceedings of the 52nd IEEE Conference on Decision and Control*, pages 7143–7148, Florence, Italy, December 2013

[C22] M. Sadeghi Reineh, M. Enqvist, and F. Gustafsson. Detection of roof load for automotive safety systems. In *Proceedings of the 52nd IEEE Conference on Decision and Control*, pages 2840–2845, Florence, Italy, December 2013

[C21] M. Schoukens, C. Lyzell, and M. Enqvist. Combining the best linear approximation and dimension reduction to identify the linear blocks of parallel Wiener systems. In *Proceedings of the 11th IFAC International Workshop on Adaptation and Learning in Control and Signal Processing*, pages 372–377, Caen, France, July 2013

[C20] C. Lyzell, M. Andersen, and M. Enqvist. A convex relaxation of a dimension reduction problem using the nuclear norm. In *Proceedings of the 51st IEEE Conference on Decision and Control*, pages 2852–2857, Maui, Hawaii, December 2012

[C19] C. Lyzell and M. Enqvist. Inverse regression for the Wiener class of systems. In *Proceedings of the 16th IFAC Symposium on System Identification*, pages 476–481, Brussels, Belgium, July 2012

[C18] C. Lyzell and M. Enqvist. Sliced inverse regression for the identification of dynamical systems. In *Proceedings of the 16th IFAC Symposium on System Identification*, pages 1575–1580, Brussels, Belgium, July 2012

[C17] J. Escobar and M. Enqvist. On the detection of nonlinearities in sampled data. In *Proceedings of the 16th IFAC Symposium on System Identification*, pages 1587–1592, Brussels, Belgium, July 2012

[C16] R. Larsson and M. Enqvist. Sequential aerodynamic model parameter identification. In *Proceedings of the 16th IFAC Symposium on System Identification*, pages 1413–1418, Brussels, Belgium, July 2012

[C15] R. Tóth, C. Lyzell, M. Enqvist, P. S. C. Heuberger, and P. M. J. Van den Hof. Order and structural dependence selection of LPV-ARX models using a nonnegative garrote approach. In *Proceedings of the 48th IEEE Conference on Decision and Control held jointly with 2009 28th Chinese Control Conference*, pages 7406–7411, Shanghai, China, December 2009

[C14] M. Enqvist. Nonlinearity detection and impulse response estimation using a weighting approach. In *Proceedings of the 15th IFAC Symposium on System Identification*, pages 628–633, Saint-Malo, France, July 2009

[C13] C. Lyzell, T. Glad, M. Enqvist, and L. Ljung. Identification aspects of Ritt's algorithm for discrete-time systems. In *Proceedings of the 15th IFAC Symposium on System Identification*, pages 681–686, Saint-Malo, France, July 2009

[C12] C. Lyzell, M. Enqvist, and L. Ljung. Handling certain structure information in subspace identification. In *Proceedings of the 15th IFAC Symposium on System Identification*, pages 90–95, Saint-Malo, France, July 2009

[C11] R. Larsson, Z. Sjanic, M. Enqvist, and L. Ljung. Direct prediction-error identification of unstable nonlinear systems applied to flight test data. In *Proceedings of the 15th IFAC Symposium on System Identification*, pages 144–149, Saint-Malo, France, July 2009

[C10] M. Enqvist. A weighting method for approximate nonlinear system identification. In *Proceedings of the 46th IEEE Conference on Decision and Control*, pages 5104–5109, New Orleans, Louisiana, December 2007

[C9] M. Enqvist, J. Schoukens, and R. Pintelon. Detection of unmodeled nonlinearities using correlation methods. In *IEEE Instrumentation and Measurement Technology Conference Proceedings*, Warsaw, Poland, May 2007

[C8] M. Barenthin, M. Enqvist, B. Wahlberg, and H. Hjalmarsson. Gain estimation for Hammerstein systems. In *Proceedings of the 14th IFAC Symposium on System Identification*, pages 784–789, Newcastle, Australia, March 2006

[C7] M. Enqvist. Identification of Hammerstein systems using separable random multisines. In *Proceedings of the 14th IFAC Symposium on System Identification*, pages 768–773, Newcastle, Australia, March 2006

[C6] J. Roll, M. Enqvist, and L. Ljung. Consistent nonparametric estimation of NARX systems using convex optimization. In *Proceedings of the 44th IEEE Conference on Decision and Control and the European Control Conference*, pages 3129–3134, Seville, Spain, December 2005

[C5] M. Enqvist, S. Gunnarsson, M. Norrlöf, E. Wernholt, and A. Hansson. The CDIO initiative from an automatic control project course perspective. In *Proceedings of the 16th IFAC World Congress*, Prague, Czech Republic, July 2005

[C4] S. T. Glad, A. Helmersson, M. Enqvist, and L. Ljung. Controllers for amplitude limited model error models. In *Proceedings of the 16th IFAC World Congress*, Prague, Czech Republic, July 2005

[C3] M. Enqvist and L. Ljung. LTI approximations of slightly nonlinear systems: Some intriguing examples. In *Proceedings of the 6th IFAC Symposium on Nonlinear Control Systems*, pages 639–644, Stuttgart, Germany, September 2004

[C2] M. Enqvist and L. Ljung. Linear models of nonlinear FIR systems with Gaussian inputs. In *Proceedings of the 13th IFAC Symposium on System Identification*, pages 1910–1915, Rotterdam, The Netherlands, August 2003

[C1] M. Enqvist and L. Ljung. Estimating nonlinear systems in a neighborhood of LTI-approximants. In *Proceedings of the 41st IEEE Conference on Decision and Control*, pages 1005–1010, Las Vegas, Nevada, December 2002

Papers at other scientific conferences

[OC5] R. Larsson and M. Enqvist. Nonlinear aerodynamic modeling of unstable aircraft using flight test data. In *Proceedings of the 28th Congress of the International Council of the Aeronautical Sciences*, Brisbane, Australia, September 2012

[OC4] M. Enqvist, P. Rosander, and D. Petersson. Självständiga laborationer i reglerteknik. In *3:e utvecklingskonferensen för Sveriges ingenjörsutbildningar*, pages 35–38, Norrköping, Sweden, November 2011

[OC3] R. Larsson and M. Enqvist. Real-time aerodynamic model parameter identification. In *Society of Flight Test Engineers International Symposium*, Linköping and Stockholm, Sweden, September 2009

[OC2] L. Lauwers, J. Schoukens, R. Pintelon, and M. Enqvist. Nonlinear structure analysis using the best linear approximation. In *Proceedings of the International Conference on Noise and Vibration Engineering*, pages 2751–2760, Leuven, Belgium, September 2006

[OC1] M. Enqvist. Benefits of the input minimum phase property for linearization of nonlinear systems. In *Proceedings of the International Symposium on Nonlinear Theory and its Applications*, pages 618–621, Bruges, Belgium, October 2005

Other scientific contributions

[O1] M. Enqvist. Variance-bias tradeoff in finite impulse response estimates obtained by correlation analysis. Technical Report LiTH-ISY-R-2416, Department of Electrical Engineering, Linköping University, Linköping, Sweden, 2002

Patents

[P1] F. Gustafsson, P. Connman, O. Öberg, M. Enqvist, and N. Odelholm. A system and method for simulation of non-linear audio equipment. Patent no. SE525332, Pending patent no. EP1492081, US2004258250, JP2005020740, 2003

Seminars and presentations

Seminars and lectures

Estimating Dynamic Models from Measurements Using System Identification Methods, Keynote lecture at the 5th International workshop on Analysis of Dynamic Measurements, SP Technical Research Institute of Sweden, Borås, Sweden. June 1, 2010.

The Use of Random Multisines in System Identification, Division of Automatic Control, Department of Electrical Engineering, Linköping University, Linköping, Sweden. April 26, 2007.

Approximate Nonlinear System Identification: Input Distributions and Reweighting Approaches, Division of Optimization and Systems Theory, Department of Mathematics, Royal Institute of Technology (KTH), Sweden. April 20, 2007.

Linear Models of Nonlinear Systems, Department of Automatic Control, Lund University, Sweden. May 11, 2006.

Linear Models of Nonlinear Systems, Department ELEC, Vrije Universiteit Brussel, Belgium. February 16, 2006.

Linear Models of Nonlinear Systems, Division of Vehicular Systems, Department of Electrical Engineering, Linköping University, Linköping, Sweden. December 21, 2005.

Some Results on Linear Models of Nonlinear Systems, Automatic Control Group, Department of Signals, Sensors and Systems, Royal Institute of Technology (KTH), Sweden. March 11, 2004.

Some Results on Linear Models of Nonlinear Systems, Licentiate thesis presentation, Department of Electrical Engineering, Linköping University, Sweden. October 20, 2003.

Conference presentations

On Estimation of Approximate Inverse Models of Block-oriented Systems, 17th IFAC Symposium on System Identification, Beijing, China, October 21, 2015.

Detection of Roof Load for Automotive Safety Systems, 52nd IEEE Conference on Decision and Control, Florence, Italy, December 11, 2013.

Invertible Time Series and System Identification in a Nonlinear Closed-loop Setting, 21st ERNSI Workshop on System Identification, Maastricht, The Netherlands. September 26, 2012.

Självständiga laborationer i reglerteknik, 3:e utvecklingskonferensen för Sveriges ingenjörsutbildningar, Norrköping, Sweden. November 30, 2011.

Dimension Reduction for System Identification – An Inverse Regression Approach, 20th ERNSI Workshop on System Identification, Nice, France. September 27, 2011.

Invertible Time Series and Closed-loop Identification of Nonlinear Systems, 6th Swedish-Russian Control Conference, Saint Petersburg, Russia. September 20, 2011.

Nonlinearity Detection and Impulse Response Estimation Using a Weighting Approach, 15th IFAC Symposium on System Identification, Saint-Malo, France. July 6, 2009.

An Improved Weighting Method for Initialization of Hammerstein or Wiener System Identification Algorithms, 17th ERNSI Workshop on System Identification, Sigtuna, Sweden. October 3, 2008.

A Weighting Method for Approximate Nonlinear System Identification, 46th IEEE Conference on Decision and Control, New Orleans, USA. December 14, 2007.

Detection of Unmodeled Nonlinearities Using Correlation Methods, IEEE Instrumentation and Measurement Technology Conference, Warsaw, Poland. May 2, 2007.

Dimension Reduction in Nonlinear System Identification, 15th ERNSI Workshop on System Identification, Linköping, Sweden. September 21, 2006.

Identification of Hammerstein Systems Using Separable Random Multisines, 14th IFAC Symposium on System Identification, Newcastle, Australia. March 30, 2006.

Benefits of the Input Minimum Phase Property for Linearization of Nonlinear Systems, International Symposium on Nonlinear Theory and Its Applications (NOLTA), Bruges, Belgium. October 20, 2005.

Identification of Hammerstein Systems Using Separable Random Multisines, 14th ERNSI Workshop on System Identification, Louvain-la-Neuve, Belgium. September 19, 2005.

Controllers for Amplitude Limited Model Error Models, 16th IFAC World Congress, Prague, Czech Republic. July 4, 2005.

LTI Approximations of Slightly Nonlinear Systems: Some Intriguing Examples, 5th Conference on Computer Science and Systems Engineering, Norrköping, Sweden. October 20, 2004.

LTI Approximations of Slightly Nonlinear Systems: Some Intriguing Examples, 6th IFAC Symposium on Nonlinear Control Systems, Stuttgart, Germany. September 3, 2004.

LTI Approximations of Slightly Nonlinear Systems: Some Intriguing Examples, Reglermöte 2004, Gothenburg, Sweden. May 26, 2004.

Input Signals for LTI Approximations of Nonlinear Systems, 12th ERNSI Workshop on System Identification, Noordwijkerhout, The Netherlands. October 6, 2003.

Linear Models of Nonlinear FIR Systems with Gaussian Inputs, 13th IFAC Symposium on System Identification, Rotterdam, The Netherlands. August 29, 2003.

Estimating Nonlinear Systems in a Neighborhood of LTI-Approximants, 41st IEEE Conference on Decision and Control, Las Vegas, USA. December 10, 2002.

Conference posters

Estimation of Unstable Nonlinear Aircraft Models, OPTEC Workshop on Moving Horizon Estimation and System Identification, Leuven, Belgium. August 29, 2012.

The Disappearance of Nonlinearities in Model Residuals for High Sampling Rates, (Together with Jésica Escobar), 20th ERNSI Workshop on System Identification, Nice, France. September 27, 2011.

Estimation of MIMO Helicopter Models in a Partially Closed Loop Setting, 19th ERNSI Workshop on System Identification, Cambridge, UK. September 27, 2010.

A Weighting Method for Approximate Nonlinear System Identification, 16th ERNSI Workshop on System Identification, Venice, Italy. October 1, 2007.

Linear Models of Nonlinear FIR Systems with Gaussian Inputs, 4th Conference on Computer Science and Systems Engineering, Norrköping, Sweden. October 23, 2002.

Linear Models of Nonlinear FIR Systems with Gaussian Inputs, 11th ERNSI Workshop on System Identification, Le Croisic, France. September 23, 2002.

Approximation of Non-Linear Systems in a Neighborhood of LTI Systems, Reglermöte 2002, Linköping, Sweden. May 30, 2002.

Variance-Bias Tradeoff in Finite Impulse Response Estimates Obtained by Correlation Analysis, 10th ERNSI Workshop on System Identification, Cambridge, UK. September 17, 2001.

Research supervision

Current students

Du Ho: Main supervisor since October 2015 (with Gustaf Hendeby as co-supervisor).

Maryam Sadeghi Reineh: Co-supervisor since October 2012 (with Fredrik Gustafsson as main supervisor). Pause since August 2014.

Ylva Jung: Main supervisor since April 2012 (with Lennart Ljung as co-supervisor) with pause November 2015 – August 2016. Co-supervisor January 2010 – April 2012 (with Lennart Ljung as main supervisor).

Roger Larsson (industrial PhD student): Main supervisor since April 2012 (with Lennart Ljung as co-supervisor). Co-supervisor September 2007 – April 2012 (with Lennart Ljung as main supervisor).

Previous students

Jonas Linder: Main supervisor October 2012 – March 2017 (with Fredrik Gustafsson and Johan Sjöberg as co-supervisors).

Christian Lyzell: Main supervisor April – November 2012 (with Lennart Ljung as co-supervisor). Co-supervisor March 2008 – April 2012 (with Lennart Ljung as main supervisor).

Theses

PhD theses

[PhD2] J. Linder. *Indirect System Identification for Unknown Input Problems: With Applications to Ships*. PhD thesis, Linköping University, Linköping, Sweden, 2017

[PhD1] C. Lyzell. *Structural Reformulations in System Identification*. PhD thesis, Linköping University, Linköping, Sweden, 2012

Licentiate theses

[Lic4] J. Linder. Graybox modelling of ships using indirect input measurements. Licentiate's thesis no. 1681, Department of Electrical Engineering, Linköping University, Linköping, Sweden, 2014

[Lic3] Y. Jung. Estimation of inverse models applied to power amplifier predistortion. Licentiate's thesis no. 1605, Department of Electrical Engineering, Linköping University, Linköping, Sweden, 2013

[Lic2] R. Larsson. System identification of flight mechanical characteristics. Licentiate's thesis no. 1599, Department of Electrical Engineering, Linköping University, Linköping, Sweden, 2013

[Lic1] C. Lyzell. Initialization methods for system identification. Licentiate's thesis no. 1426, Department of Electrical Engineering, Linköping University, Linköping, Sweden, 2009

Thesis examining committee and opponent commissions

Member of the examining committee for Per Mattsson, Department of Information Technology, Uppsala University, Sweden. November 25, 2016.

Member of the examining committee for Frank Boeren, Department of Mechanical Engineering, Eindhoven University of Technology, The Netherlands. October 3, 2016.

Member of the examining committee for Liang Dai, Department of Information Technology, Uppsala University, Sweden. April 29, 2016.

Member of the examining committee for Martin Sivertsson, Department of Electrical Engineering, Linköping University, Sweden. June 5, 2015.

Discussion leader at the licentiate thesis presentation of Niklas Everitt, School of Electrical Engineering, KTH, Stockholm, Sweden. February 11, 2015.

Member of the examining committee for Per Hägg, School of Electrical Engineering, KTH, Stockholm, Sweden. October 17, 2014.

Member of the examining committee for Egi Hidayat, Department of Information Technology, Uppsala University, Sweden. March 3, 2014.

Member of the examining committee for Yasir Irshad, Department of Engineering and Physics, Karlstad University, Sweden. March 26, 2013.

Discussion leader at the licentiate thesis presentation of Egi Hidayat, Department of Information Technology, Uppsala University, Sweden. June 1, 2012.

Member of the examining committee for Aivar Sootla, Department of Automatic Control, Lund University, Sweden. January 12, 2012.

Member of the examining committee for Agnes Rensfelt, Department of Information Technology, Uppsala University, Sweden. May 7, 2010.

Editorial work

Associate Editor for IEEE Control Systems Letters. Since January 2017.

Associate Editor for Automatica. Since December 2008.

Member of the International Program Committee for the 17th IFAC Symposium on System Identification, 2015.

Member of the International Program Committee for the 16th IFAC Symposium on System Identification, 2012.

Paper reviewing activities for Automatica, IEEE Transactions on Automatic Control, International Journal of Control, Control Engineering Practice, IEEE Transactions on Signal Processing, IEEE Signal Processing Letters, IEEE Transactions on Instrumentation and Measurement, IEEE Transactions on Microwave Theory and Techniques as well as for various conferences.

Research administration

Organizer of the ERNSI workshop in Varberg, Sweden in September 2015. (This was an international workshop with 86 participants.)

Contact person at Linköping University for the MarineUAS project. Since January 2015.

Team leader for the Swedish team within the European Research Network on System Identification (ERNSI). Since September 2012.

Area coordinator for Aerial Vehicles and Marine Vessels within the Vinnova Industry Excellence Center LINK-SIC. Since 2008.

Teaching experience

All teaching experience is from Linköping University.

Graduate courses

Adaptive Control and Recursive System Identification. 2015.

Organizer of the graduate project course *Applied Control and Sensor Fusion* together with David Törnqvist. 2010.

Examiner and lecturer in undergraduate courses

Industriell reglerteknik (Industrial Control Systems): 10 times

Reglerteknik (Automatic Control): 8 times

Realtidsprocesser och reglering (Real Time Process Control): once

Digital styrning (Digital Control): once

Teaching assistant in undergraduate courses

Reglerteknik (Automatic Control): 7 times

Digital styrning (Digital Control): twice

Reglerteori (Control Theory): 4 times

Reglerteknisk projektkurs (Automatic Control Project Course): twice

Modellbygge och simulering (Modeling and Simulation): once

Propedeutisk kurs i matematik (Introductory Mathematics): twice

Lab assistant in undergraduate courses

Lab assistant in various labs in automatic control, modeling and signal processing.

Examiner for MSc students

[MSc43] Lucas Nilsson, Estimation of Ship Properties for Energy Efficient Automation. 2016.

[MSc42] Johan Toverland, Thermal Modelling of Voicecoils in Microspeakers. 2016.

[MSc41] Sofia Johnsen (and Sarah Felldin), Improving Knowledge of Truck Fuel Consumption Using Data Analysis. 2016.

[MSc40] Sofia Larsson Cahlin, Real-time Estimation of Aerodynamic Parameters. 2016.

[MSc39] Ingrid Kugelberg, Black-Box Modeling and Attitude Control of a Quadcopter, 2016.

[MSc38] Marcus Bäck, Grey-box Modelling of a Quadrotor Using Closed-loop Data, 2015.

[MSc37] Joachim Larsson, CPU Load Control of LTE Radio Base Station, 2015.

[MSc36] Marcus Trulsson and John Wilhelms, Open Loop Control of Piezoelectric Cantilever Speaker, 2015.

[MSc35] Carl-Philip Forss, Analysis and Visualization of Validation Results, 2015.

[MSc34] Johan Karlén, Uncertainty Quantification of a Large 1-D Dynamic Aircraft System Simulation Model, 2015.

[MSc33] Henric Edlund, Model-based Automatic Tuning and Control of a Three-axis Camera Gimbal, 2015.

[MSc32] Pär Lundgren, Using Homographies for Vehicle Motion Estimation, 2015.

[MSc31] Rickard Sjölund and Nicklas Vedin, Steering System Modelling for Heavy Duty Vehicles, 2015.

[MSc30] Henning Roos, Utveckling av verktyg för linjär analys av JAS 39 Gripens styrsystem, 2015.

[MSc29] Mikael Rosell, Semi-Supervised Learning for Object Detection, 2014.

[MSc28] Henrik Felixson, Vehicle Ahead Property Estimation in Heavy Duty Vehicles, 2014.

[MSc27] Ylva Björk and Ebba Wilhelmsson, Linearisation of Micro Loudspeakers Using Adaptive Control, 2013.

[MSc26] Johan Särnbrink, Systemidentifiering och reglering av en luftningsbassäng på ett reningsverk, 2013.

[MSc25] Robert Hallberg, Target Classification Based on Kinematics, 2012.

[MSc24] Jonas Källman, Ship Power Estimation for Marine Vessels Based on System Identification, 2012.

[MSc23] Hanna Pettersson, Estimation and Pre-Processing of Sensor Data in Heavy Duty Vehicle Platooning, 2012.

[MSc22] Marcus Arvidsson and Daniel Karlsson, Attenuation of Harmonic Distortion in Loudspeakers Using Non-linear Control, 2012.

[MSc21] Ola Tybrandt, Distribution of Cooling to Avionics, 2012.

[MSc20] Dino Kapidzic, Reglering av vridbord, 2012.

[MSc19] Calle Skillsäter, Evaluation and Configuration of a Control Loop Asset Monitoring Tool, 2011.

[MSc18] Emil Granberg, Modelling of a Separator Discharge System, 2010.

[MSc17] Anton Höghäll, Tuning of Metaheuristics for Systems Biology Applications, 2010.

[MSc16] Oscar Samuelsson, Benchmarking Global Optimization Algorithms for Core Prediction Identification, 2010.

[MSc15] Tony Gillberg, Adaptiva metoder för systemidentifiering med inriktning mot direkt viktoptimering, 2010.

[MSc14] Peter Nyberg, Evaluation of Two Methods for Identifiability Testing, 2009.

[MSc13] Mattias Lager, Modellering av uppdragsberäkningar i JAS 39 Gripen, 2009.

[MSc12] Peter Jägerback, En indirekt metod för adaptiv reglering av en helikopter, 2009.

[MSc11] Andreas Gising, MALLS – Mobile Automatic Launch and Landing Station for VTOL UAVs, 2008.

Supervisor for MSc students

[MSc10] Niklas Karlsson, Analysis and Modeling of String Instruments, 2005.

[MSc9] Peter Holmqvist, Automatisk bedömning av reglerkretsars prestanda, 2005.

[MSc8] Arvid Rosén, Analysis and Modeling of Vacuum Tube Power Amplifiers, 2004.

[MSc7] Johan Kälvesten, Signal Processing and Algorithm Evaluation Tool for Collision Prediction and Crash Sensing Automotive Radars, 2004.

[MSc6] Peter Gäärd, Kappa Control with Online Analyzer Using Samples from the Digester's Mid-phase, 2004.

[MSc5] David Andersson and Johan Fjellström, Vehicle Positioning with Map Matching Using Integration of a Dead Reckoning System and GPS, 2004.

[MSc4] Niklas Odelholm, Identification and Simulation of the Nonlinearities and Acoustic Properties of a Loudspeaker, 2004.

[MSc3] Per Connman and Oscar Öberg, System Identification of Nonlinear Electronic Devices, 2003.

[MSc2] Daniel Rosell, Modellering och simulering av tryckreglersystemet till en kärnkraftsreaktor, 2003.

[MSc1] Henrik Johansson, Gain Scheduled Missile Control Using Robust Loop Shaping, 2002.

Examiner for BSc students

[BSc1] Mikael Wessén, Förbättrad manuell styrning av staplingskran, 2015.

Examiner for internship students

Jochen Withopf, Modeling of a Guitar Loudspeaker Cabinet in a Reverberant Environment, 2009.

Christian Schreck, Simulations Programmed with the Automatic Control Software Proview, 2008.

Course development and education planning

Member and vice chairman of the committee for electrical engineering, physics and mathematics education (EF-nämnden) at Linköping University. Since January 2015.

Deputy member of the committee for electrical engineering, physics and mathematics education (EF-nämnden) at Linköping University. January 2012 – December 2014.

Responsible for the Control and Information Systems study profile within the Applied Physics and Electrical Engineering program. Since February 2010.

Development of vignettes and a hand-in exercise for the course *Reglerteknik* (Automatic Control) for the Information Technology program. March – April 2010.

Coordinator for the development of a new PID implementation lab. Participated in the programming and the writing of a new lab compendium for this lab. December 2009 – February 2010.

Coordinator for the development of new hardware for the Lego factory lab. Participated in the programming and the writing of a new lab compendium for this lab. April 2009 – January 2010.

Development of an exercise compendium (with 36 new and 14 revised, old exercises) for the course *Industriell reglerteknik* (Industrial Control Systems). January – February 2008.

Development of a lab with the title *Modellbaserad prediktionsreglering av destillationskolonn* (Model Predictive Control of a Distillation Column) for the course *Industriell reglerteknik* (Industrial Control Systems). February 2008.

Coordinator for the development of a new theory compendium for the course *Industriell reglerteknik* (Industrial Control Systems) and author to the sections about feed-forward control, the Smith predictor and mid-range control (13 pages). December 2007.

Participated in the development of a new international master's program in *Control and Autonomous Systems*. Autumn 2007.

Pedagogy courses

Teaching in Higher Education, Step 3a: Supervision in doctoral studies, Linköping University, 2009 (3 ECTS credits)

Teaching in Higher Education, Step 2: Designing, evaluating and organizing learning (DUO), Linköping University, 2009 (6 ECTS credits)

Teaching in Higher Education, Step 1: Learning, teaching and knowledge (LUK), Linköping University, 2003 (4 credits = 6 ECTS credits).

An introduction to PBL, Linköping University, 2000 (2 days).

Department commissions

Webmaster for the website of the Division of Automatic Control (including the transfer to a new webserver in October 2012). Since May 2010.

Responsible for the research lab at the Division of Automatic Control. Since October 2008.

Responsible for the version control of the common files at the Division of Automatic Control (including coordination of the transfer of all course material to this system in October–November 2008). Since August 2008.

Coordinator for the technical support tasks and technical development projects of the Division of Automatic Control. January 2011–April 2016.

Responsible for the arrangement of a three-day course about Robust and Adaptive Control. September 2008.

Language skills

Swedish: Mother tongue

English: Fluent

German: Basic knowledge

Dutch: Beginner

Miscellaneous

Member of the Institute of Electrical and Electronics Engineers (IEEE) and of IEEE Control Systems Society. Since September 2008.

Member of the board of the Department of Electrical Engineering, Linköping University, Sweden. July 2003 – June 2005.

Military service at A1 in Linköping, Sweden. August 1995 – May 1996.

Awards and honors

Iplom by the students at the Industrial Engineering and Management program at Linköping University for the high course evaluation score for the course Industriell reglerteknik (Industrial Control Systems), 2012, 2015 and 2016.

Letter from the dean acknowledging the high course evaluation score for the course Industriell reglerteknik (Industrial Control Systems), 2009, 2010, 2011, 2013 and 2014. (No letters have been sent after 2014.)

Nominated for the pedagogical prize *Gyllene moroten* by the students at the Information Technology program at Linköping University, 2010 and 2012. (Gyllene moroten is a prize instituted by LinTek, the student union at the faculty of technology at Linköping University. The prize is given to recognize and reward outstanding pedagogical achievements during the previous academic year.)

Letter from the dean acknowledging the high course evaluation score for the course Reglerteknik (Automatic Control) for the Information Technology program, 2010.

Nominated for the teacher prize of the Applied Physics and Electrical Engineering program at Linköping University, 2010.

Letter from the dean acknowledging the high course evaluation score for the course Realtidsprocesser och reglering (Real Time Process Control), 2009.

Automatica Outstanding Reviewer, 2003.

The Tryggve Holm Medal for best grade point average in the Applied Physics and Electrical Engineering program at Linköping University during the academic year 2000 – 2001.