

CV of Mattias Nyberg

Adjunct Professor in Dependable Control Systems
at Mechatronics and Embedded Control Systems, KTH, Stockholm, Sweden

Personal Data

Name

Mattias Nyberg

Date of birth

1970-04-22

Telephone numbers

Home: 08-7784184

Mobile/Work: 070-7883736

Work address

By 118, EPXS

Scania

15187 Södertälje

and

Mechatronics division, KTH

Brinellvägen 83

100 44 Stockholm

Email

mattias.nyberg@scania.com

Language skills

- Swedish (fluent)
- English (fluent)
- German (basic)

Academic degrees

- Master of Science (civilingenjör) in Computer Science and Engineering, Linköping University, 1994.
- Master of Science in Electrical Engineering and Applied Physics, Case Western Reserve University, Cleveland, Ohio, USA, 1994.
- PhD in Electrical Engineering, at Linköping University, ISY, Vehicular Systems, June 1999.
- Docent degree from Linköping University, ISY, Vehicular Systems, Feb 2006.

Employments

Current employment

- Expert Engineer at Division of Systems Architecture, Scania: employed 2010-10-01.
With specialization functional safety (ISO 26262), system architecture, and requirements engineering.
- Adjunct Professor in Dependable Control Systems 20%, Mechatronics Division, KTH: employed 2013-02-01

Employment history

- 1994-11-15 – 1999-07-01 PhD Student at Linköping University, ISY, Vehicular Systems. The work was conducted in the form of a cooperation project between ISY and Saab Automobile.
- 1999-08-01 – 2000-09-01 DaimlerChrysler Research Division, Stuttgart (post-doc position)
- 2001-09-15 – 2010-10-01 Technical Manager at Powertrain Control Systems Development, Scania.
- 1999-07-01 – 2006-02-28 Assistant Professor (forskarassistent) at Linköping University, ISY, Vehicular Systems. (Working 10%-15% during the periods 1999-08-01 – 2000-09-01 and 2001-09-15 – 2006-02-28).
- 2006-03-01 – 2012-06-30 Associate Professor (lektor) 15% at Linköping University, ISY, Vehicular Systems.

Parental leaves

- Aug 2005 – Jan 2006
- June 2009 – Jan 2010

Research Funding and Governance

Research Funding as Main Applicant

- Vetenskapsrådet: project-number 2001-3124, "Methodology development for engineering tools for model-based fault-diagnosis"
- IVSS and Vinnova: project AL80A2004:24045, "Fault detection and isolation for fault-tolerant architectures"
- Vinnova: project 2006-01574, "Model Based Residual Generation for Diesel Engines"
- Vinnova: project 2007-01623, "Automated off-board assistance"
- Vinnova: project 2010-02864, "Guided integrated remote and workshop diagnosis"
- Vinnova: project 2011-04446, "Espresso – Efficient development with Functional Safety"

Research Funding (co-applicant)

- ITEA2 MODRIO (European project)
- Vinnova: "VeriSpec – Verification and Specification of Functional Safety", (with AB Volvo and MDH, main applicant Hans Hansson MDH)
- ITEA3 ASSUME (European project)
- ITEA3 REVaMP (European project)
- PRYSTINE (European project)

Research Governance

Evaluator of INRIA research program on model-based diagnosis 2009.

Academic Assignments

Membership of academies

- Member of the IFAC SAFEPROCESS Technical Committee (still ongoing)
- Program committee of DX (still ongoing)
- Program committee of ECAI 2009
- Program committee of Modelica Conference 2012-2016
- Program committee of ISSRE 2016

Assignments as public examiner/opponent

- Member of examination committee at Dan Lawesson's PhD dissertation 2005, Linköping University.
- Opponent of Andre Bittencourt's Licentiate thesis 2012. Linköping University.
- Member of examination committee at *Tahir* Naseer Qureshi's PhD dissertation 2012, KTH.
- Opponent of Rakesh Rana's Licentiate thesis 2013. Göteborg University.
- Member of examination committee at Rakesh Rana's PhD dissertation Jan 2015, Göteborg University.
- Member of examination committee at Irfan Sljivos' Licentiate Seminar, June 2015, MDH.
- Opponent of Sahar Tahvili's Licentiate thesis, Oct 2016. Mälardalens Högskola.
- Member of examination committee at Jiale Zhou's PhD dissertation, Jan 2018

Referee for International Publications

A reviewer for a lot of international journals in control theory and computer science.
And even more so, a reviewer for conference publications.

Invited Speaker

- Keynote speaker at 10th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (SAFEPROCESS), 2018, Warsaw, Poland.
- Keynote speaker at 22nd International Systems and Software Product Line Conference (SPLC2018), Industry Forum, 2018, Gothenburg, Sweden.

- Invited speaker to the ISO26262 conference 2014 in Frankfurt.
- Invited speaker to 12:th International Workshop on Principles of Diagnosis, 2001, Italy.
- Invited speaker at a number of national industrial conferences: e.g. INCOSE, Elektronik i Fordon, ICES Conference on Architecture

Awards

- 2018: Best paper award at FORTE 2018 (38th IFIP WG 6.1 International Conference on Formal Techniques for Distributed Objects, Components, and Systems) with the paper “Preserving Contract Satisfiability Under Non-monotonic”
- 2014: Vincent Bendix Automotive Electronics Engineering Award for best SAE paper in any of its conferences or journals and in the area of automotive electronics engineering.
- 2000: Polyx Best Paper Award - announced at the 3rd IFAC Symposium on Robust Control Design ROCOND2000 held in Prague.
- 1994: Tryggve Holm price - given every year to the best student from Linköping University at each program.

Patents

064-11	Dynamisk DTC-text	08 apr 2011	Sweden.
118-11	Automatiserad systemreaktion i SDP3	27 jun 2011	Sweden.
190-06	Algoritm för multipelfel	26 jun 2006	Sweden, Germany and USA.
191-06	Algoritm för multipelfel II	26 jun 2006	Sweden, Germany and USA
202-06	Calculation of DTC confirm and suspect bits	30 aug 2006	Germany and USA.
253-06	Precomputed Fault Isolation Logic	09 nov 2006	Sweden and EPO.

Pedagogical Achievements

Lecture assistant for MSc students (=civilingenjörstudententer):

During years 1995-2001:

- Multivariable calculus
- Control theory
- Supervision and diagnosis of technical processes
- Avionics

Development of MSc courses

- Avionics. This was a course given during a limited time, developed from scratch, with a research focus, and relatively few students.
- Diagnosis and Supervision of Technical Processes, TSFS06 (see www.vehicular.isy.liu.se/Edu/Courses/TSFS06/). This course was developed mostly from scratch, with a basis in the research conducted by myself and my colleague Erik Frisk. It is still given yearly to the Y and D programs with to around 40-50 students attending each year. I am the first author of the textbook used in the course. I have also taken parts in writing laboratory instructions and exercises.
- Vehicular Systems, TSFS05 (see www.vehicular.isy.liu.se/Edu/Courses/TSFS05/). Development of laboratory tasks and one chapter (about automotive engine diagnosis) in the course literature.

Lecturer, course responsible, examiner of MSc course

- Diagnosis and Supervision of Technical Processes, TSFS06. Planning, development, giving lectures, and examination of the course.

Course for PhD students

- PhD course in “Model based diagnosis” at Linköping University, 2001. Planning, course development, giving lectures, and examination. I initiated this course in 2001 but it is still given with an interval of 2-3 years. The course has also had industrial participation.
- PhD course in “Modeling Dependability of Cyber-Physical Systems” at KTH, 2015. Initiation, course development, giving lectures, making exercises, and examination.

MSc thesis supervisor

In total I have supervised more than 100 students, most of them as an industrial supervisor, but around 20 of these also as the university supervisor/examiner. The projects have all been within the

areas of control theory, diagnosis, modelling, simulation, functional safety, SW and system architecture, requirements engineering.

Pedagogical course

I have taken a mandatory course in PhD supervision at LiU as part of my work towards the Docent-degree. Completed 2005 at Linköping University.

Guest lecturer

I have been invited and given guest lectures at universities for MSc and PhD students:

- the course Diagnosis and Supervision of Technical Processes given at LiU, several times as a guest lecturer from industry
- the course Safety Critical Systems Engineering given at MDH, several times as a guest lecturer from industry
- a seminar series in diagnosis given at LAAS CNRS Institute in Toulouse

Planning and administering teaching

Member of program committee of the civilingenjör-program for Computer Science and Engineering at Linköping university 2007-2008

Teaching material (Course literature)

- *Diagnosis of Technical Processes*, M. Nyberg and E. Frisk, 2004-2016
Used in the course Diagnosis and Supervision TSFS06 at Linköping University (see www.vehicular.isy.liu.se/Edu/Courses/TSFS06/)
- *Övningar i diagnos och övervakning*, E. Frisk, M. Nyberg, et al., 2004-2016
Used in the course Diagnosis and Supervision TSFS06 at Linköping University

PhD Supervision Experience

PhD Main Supervisor

Ongoing: Verification of Autonomous Vehicles

Joakim Gustavsson, started Nov 2015.

Ongoing: Verification Functional Safety of Automotive Product Lines

Damir Nesic, started Sep 2015.

Specifying Safety-Critical Heterogeneous Systems Using Contracts Theory
Jonas Westman (finished Sep 2016)
PhD thesis No. MMK2016-05, KTH.

Methods for Fault Detection and Isolation with Automotive Applications
Carl Svärd (finished 2012)
PhD thesis, No. 1448. Linköping University.

Probabilistic Fault Diagnosis with Automotive Applications
Anna Pernestål (finished 2009).
PhD thesis, No. 1288, Linköping University.

Design and Analysis of Diagnosis Systems Using Structural Methods
Mattias Krysanter (finished 2006).
PhD thesis, Dissertation No. 1033, Linköping University.

PhD Co-Supervisor

Fault Isolation in Distributed Embedded Systems
Jonas Biteus (finished 2007)
PhD thesis, No. 2007. Linköping University.

Computer-Assisted Troubleshooting for Efficient Off-board Diagnosis
Håkan Warnqvist (finished 2011)
Lic thesis, No. 2011:29. Linköping University.

Administrative and Leadership Experience

Experience of leading units

- Team leader of diagnosis research team (4 persons) at Linköping University, Vehicular Systems, 2000-2001.
- As *Technical Manager*, responsible for research and development of Scania's engine diagnosis systems, leading ca. 10 persons, 2002-2010.
- As responsible for Scania's predevelopment and research in functional safety, leading a team of ca. 10 researchers and engineers, 2012 - ongoing.
- Project leader of all research projects with me as main applicant (this typically involves up to 10 academic and industrial persons.)

Conference Organization

- Chair of International Workshop on Principles of Diagnosis, DX09, Stockholm, 2009
- Organizing one session at SAFEPROCESS 2009

Other professional administrative duties

- Scania's representative for diagnosis in the European automotive lobby organization ACEA 2001-2010, with monthly working meetings in Brussels.
- ACEA:s vice representative in United Nations' work on global technical regulations for diagnosis ca 2004-2006