Strategiskt rådsmöte 3 2017
2017-03-21 kl. 13:00
Konferensrum Freja,
Teknikringen 8

KTH Teknikvetenskap

Protokoll

Närvarande:	Leif Kari	Anders Forsgren
	Karin Blom	Anna-Karin Burström
	Katja Grillner	
	Anna Finne Wistrand	
	Anton Lu	
	Mats Wallin	
	Jens Fransson	

1. Mötets öppnande

Ordförande Leif Kari förklarar mötet öppnat kl. 13:00

Rektor har beslutat att KTHs organisation ska utredas. Utgångspunkten är att tio skolor ska bli fem. I och med beslutet så förlängs skolchefs och vice skolchefs mandat året ut. Även mandaten för strategiska rådets representanter förlängs året ut. Formen för skolans strategiska råd kommer mest troligt att förändras.

Oscar Tjernberg avgår som extern representant i rådet eftersom hans avdelning flyttat över till SCI-skolan och han inte längre är extern.

2. Anmälda förhinder

Jakob Kuttenkeuler har anmält sen ankomst.

3. Närvaro- och yttranderätt

Anders Forsgren och Anna-Karin Burström ges närvaro- och yttranderätt under hela mötet.

4. Val av justeringsperson

Karin Blom utses till justeringsperson.

5. Fastställande av föredragningslista [bilaga 1]

3 ärenden har inkommit efter att handlingarna skickades ut. Rådet får besluta om dessa kan hanteras vid dagens möte. I övrigt fastställs föredragningslistan utan ändringar.

6. Föregående protokoll (rådsmöte 17 januari 2017)

Protokollet från rådsmötet 17 januari 2017 läggs till handlingarna.

7. Anmälningar [bilaga 2]

Leif Kari redovisar aktuella disputationer och licentiatseminarier enligt bilaga 2.

8. Rekryteringsärenden, fakultetsförnyelse och jämställdhet

a. Rapport av pågående ärenden [bilaga 3]

Anders Forsgren redovisar pågående rekryteringsprocesser, befordringsärenden och docentärenden.

b. Förlängning av affilierad fakultet i Fordonsdynamik [bilaga 4]

Anders Forsgren föredrar ärendet. Rådet diskuterar de finansiella transaktionerna som är statuerade i avtalet.

Strategiska rådet beslutar

att inte föreslå något beslut till skolchef utan skicka vidare ärendet till dekanus för en principdiskussion kring affilierad fakultet och finansieringen av dessa. Ärendet tas sedan upp igen vid nästa rådsmöte.

c. Adjunkt i Matematik [bilaga 5]

Anders Forsgren föredrar ärendet.

Strategiska rådet beslutar

att föreslå skolchefen att tillstyrka ärendet.

d. Adjunkt i Matematisk Statistik [bilaga 6]

Anders Forsgren föredrar ärendet. Ärendet är inte utskickat i förväg men rådet beslutar att behandla ärendet vid sittande bord.

Strategiska rådet beslutar

att föreslå skolchefen att tillstyrka ärendet.

e. Affilierade professorer i Matematik[bilaga 7]

Anders Forsgren föredrar ärendet. Ärendet är inte utskickat i förväg men rådet beslutar att behandla ärendet vid sittande bord. Rådet vill att den eventuella finansiella ersättningen tydliggörs.

Strategiska rådet beslutar

att föreslå skolchefen att tillstyrka ärendet med föreslagen ändring.

f. Affilierad fakultet i Hållfasthetslära[bilaga 8]

Anders Forsgren föredrar ärendet. Ärendet är inte utskickat i förväg men rådet beslutar att behandla ärendet vid sittande bord.

Strategiska rådet beslutar

att föreslå skolchefen att tillstyrka ärendet.

g. Affilierad fakultet i Hållfasthetslära[bilaga 9]

Leif Kari föredrar ärendet.

Strategiska rådet beslutar

att föreslå skolchefen att tillstyrka ärendet.

9. ADOPT

Val Zwiller, ordförande för ADOPT presenterar verksamheten.

10. Övriga frågor

Inga övriga frågor.

11. Mötets avslutande

Leif Kari förklarar mötet avslutat.

Vid protokollet

Anna-Karin Burström

Justeras

Leif Kari

Karin Blom

Strategiskt rådsmöte 2 2017
2017-03-21 kl. 10:00
Sammanträdesrum Freja, TR 8, plan 2

Föredragningslista

*= bilaga finns

1. Mötets öppnande
2. Anmälda förhinder
3. Närvaro- och yttranderätt
4. Val av justeringsperson
5. Fastställande av föredragningslista
6. Föregående protokoll (rådsmöte 17 januari 2017)
7. Anmälningar*
8. Rekryteringsärenden, fakultetsförnyelse och jämställdhet
    a. Rapport av pågående ärenden *
    b. Förlängning av affilierad fakultet i Fordonsdynamik*
    c. Adjunkt i Matematik*
9. Inbjuden gäst: Föreståndare för ADOPT, Val Zwiller.
10. Mötets avslutande

KTH, SE-100 44 Stockholm. Tel: 08-790 7602
E-post:akbu@kth.se www.kth.se/sci

Licentiatseminarier

19 januari - 21 mars

19
januari
Flow and Heat Transfer in a Turbocharger Radial Turbine
Teknisk mekanik
Plats: sal Q2, Osquldas väg 10, KTH, Stockholm
Licentiand: Shyang Maw Lim, Mekanik

10
februari
Spectral Analysis of Gamma-Ray Bursts Using a Model for Subphotospheric Dissipation
Astrophysics
Plats: Sal FB42, AlbaNova, Roslagstullsbacken 21, Stockholm
Licentiand: Björn Ahlgren, Fysik

17
mars
Relative information based distributed control for intrinsic formations of reduced attitudes
Tillämpad matematik och beräkningsmatematik
Plats: Room 3721, Lindstedtsvägen 25, KTH, Stockholm
Licentiand: Silun Zhang, Matematik

Disputationer

18 januari - 21 mars

20
januari
Passive acoustic leak detection in energy conversion systems of sodium fast reactors
Fysik - kärnteknik
Plats: Sal FA32, AlbaNova Universitetscentrum, Roslagstullsbacken 21, Stockholm
Respondent: Anders Riber Marklund, Fysik

27
januari
An experimental and numerical study of an automotive cooling module
Farkostteknik
Plats: sal D2, Lindstedtsvägen 5, KTH, Stockholm
Respondent: Anders Rynell, Farkost och Flyg

31
januari
Development of an Improved Thermal-Hydraulic Modelling of the Jules Horowitz Reactor
Nuclear engineering
Plats: Sal FA32, AlbaNova, Roslagstullsbacken 21, Stockholm
Respondent: Reijo Pegonen, Fysik

3
februari
Effect on Drag Reducing Plasma Actuators using LES
Teknisk mekanik
Plats: Sal F3, Lindstedtsvägen 26, KTH, Stockholm
Respondent: Romain Futrzynski, Farkost och flyg

10
februari
3-D Forming of Paper Materials
Hållfasthetslära
Plats: Sal F3, Lindstedtsvägen 26, KTH, Stockholm
Respondent: Eric Linvill, Hållfasthetslära

17
februari
Input Calibration, Code Validation and Surrogate Model Development for Analysis of Two-phase Circulation Instability and Core Relocation Phenomena
Fysik
Plats: Sal FA32, AlbaNova
Respondent: Viet-Anh Phung, Fysik

24
februari
The Rotating-Disk Boundary-Layer Flow Studied Through Numerical Simulations
Teknisk mekanik
Plats: Sal F3, Lindstedtsvägen 26, KTH, Stockholm
Respondent: Ellinor Appelquist, Mekanik

16
mars
Mechanics of Nanocellulose Foams: Experimental and Numerical Studies
Hållfasthetslära
Plats: Sal F3, Lindstedtsvägen 26, KTH, Stockholm
Respondent: Prashanth Srinivasa, Hållfasthetslära

17
mars
Towards efficient vehicle dynamics development: From subjective assessments to objective metrics, from physical to virtual testing
Farkostteknik
Plats: Sal D3, Lindstedtsvägen 5, KTH, Stockholm
Respondent: Gaspar Luis Gil Gómez, Farkost- och flygteknik

17-mar
Plasma Actuators for Separation Control on Bluff Bodies
Teknisk mekanik
Plats: Sal F3, Lindstedtsvägen 26, KTH, Stockholm
Respondent: Julie Vernet, Mekanik

Aktuella anställningsärenden

SCI	Biträdande lektor	flygteknik	S-2016-1309	Sista ansökningsdatum 2017-04-14
SCI	Gästprofessor	tillämpad fysik	2017-0010	Katja, Leifs signatur på beslutet. Överlämnat till Annica för signering 2017-03-13
SCI	Lektor	flygteknik	VL-2016-0181	Sista ansökningsdatum 2017-04-13
SCI	Lektor	matematik (2st)	VL-2017-0009	Sista ansökningsdataum 2017-05-02
SCI	Professor	Brummer & Partners professor i matematik med inr analys komplexa data	VL-2015-0116	Katja, Leifs signatur på beslutet. Överlämnat till Annica för signering 2017-03-13

Aktuella befordringsärenden

Pär Olsson, väntar på ett sakkunnigutlåtande, ett har kommit in.

Fredrik Lundell, AU 14 mars, AU ska ta ställning till om ansökan ska behandlas vidare.

Anatoly Belonoshko, AU 14 mars, AU ska godkänna förslaget på sakkunniga.

Docentärenden

Pågående ärenden

Ciarán O´reilly	Intervju planeras
Pål Efsing	Intervju planeras
Sohrab Kazemhvazi	Docentpresentation 21 mars
Abdusalam Uheida	Hos sakkunnig
Patrick Henning	Intervju planeras
Danijela Damjanovic	Hos anställningsutskottet

KTH Farkost & Flyg

2017-03-01

Skolchef Professor Leif Kari
Skolan för Teknikvetenskap
KTH

KTH INDUSTRIAL FACULTY – Anhållan om förlängning av affilierad forskare i Fordonsdynamik

Som en del av KTHs satsning "Industrial faculty" så har Mats Jonasson, Volvo Cars, född 690208-5510, varit affilierad forskare vid KTH Farkost & Flyg inom ämnet Fordonsdynamik med särskild inriktning mot innovativa fordonskoncept i 3 + 3 år.

KTH och Volvo Cars är mycket nöjda med affilieringen och anhåller härmed om att förlänga den med ytterligare tre år. Vi föreslår omfattningen 20% under perioden 2017-03-01 – 2020-02-28.

I Bilaga 1 bifogas avdelningens redogörelse av vad Mats har åstadkommit under sin tidigare affilieringstid. I Bilaga 2 bifogas Mats Jonassons avsiktsförklaring.

Vad beträffar finansiering föreslås att den såsom tidigare sker inom ramen för riktade medel till forskargruppen inom den strategiska satsningen TRENoP. Vi föreslår att Mats Jonasson fortsätter vara 100 % anställd av Volvo Cars. I överenskommelse med Volvo Cars (se Bilaga 3) ersätter KTH Volvo Cars för lönekostnader motsvarande 176 400 SEK/år. KTH ersätter även resor, logi, arbetsplats på KTH samt relaterade kostnader.

Docent Mats Jonasson är en mycket skicklig forskare, han är innovativ, har ett flertal patent, bidrar till undervisningen och har stor industriell erfarenhet. I Bilaga 4 bifogas hans Curriculum Vitae samt ansökan där han redogör för vilka områden han avser att driva under denna 3-års period.

Detta är alltså en aktiv del i ambitionen att fortsätta bygga upp KTH industrial faculty inom TRENoP.

Genom detta samarbete bidrar Mats Jonasson till forskargruppen KTH Fordonsdynamik när det gäller både forskning, forskarhandledning samt undervisning. Dessutom är vår gemensamma plan att verka för en adjungerad professur inom området.

Stockholm datum som ovan

Sebastian Stichel	Annika Stensson Trigell	Lars Drugge
Prefekt	Professor Fordonsdynamik	Chef SDB

KTH Farkost & Flyg – SE–100 44, Tel: 08 790 79 63, Epost: pege@kth.se www.ave.kth.se

Professor Annika Stensson Trigell
Associate Professor Lars Drugge
KTH fordonsdynamik

Affilierad forskare inom fordonsdynamik med inriktningen innovativa fordonskoncept vid KTH fordonsdynamik, institutionen för farkostteknik, KTH

Vi vid KTH Fordonsdynamik anser att det är mycket angeläget att förlänga Mats Jonassons affiliering inom fordonsdynamik med inriktningen innovativa fordonskoncept i ytterligare en treårsperiod (2017-03-01 – 2020-03-01).

Mats kompetens har tillfört forskargruppen en profil inom framtida fordonskoncept, elfordon och fordonsdynamisk reglerteknik. Detta är områden som bedöms få extra stort genomslag vid elektrifieringen som är en påbörjad trend inom bilindustrin.

Mats arbetar på Volvo Cars som teknisk expert med fordondynamisk reglering av bilars aktuatorer, såsom bromsar, styrsystem, dämpare, elektrisk framdrivning och tvär- och längskopplingar. Han utvecklar också algoritmer för estimering av bilars fordonsdynamiska tillstånd, såsom längshastighet, avdriftsvinklar etc. Det skall också nämnas att han arbetar inom området Autonom körning, som syftar till att utveckla självkörande bilar. Han har ett väl utvecklat internationellt nätverk och är delaktig i flertalet forskningsprojekt inom de beskrivna områdena.

Under den tidigare affilieringsperioden har Mats publicerat 6 artiklar i vetenskapliga tidskrifter och 8 referentgranskade internationella konferensbidrag. Mats har referentgranskat 4 artiklar för olika tidskrifter. Mats är också medlem i Editorial board för tidskriften International Vehicle Systems Modelling and Testing. Mats har fått också under perioden lämnat in 5 patentansökningar inom sitt ämnesområde.

När det gäller forskarhandledning så har Mats varit biträdande handledare till doktoranderna Johannes Edrén (PhD 2014-12-02. Titel: Motion modelling and control strategies for over-actuated vehicles, TRITA AVE 2014:75) samt Daniel Wanner (PhD 2015-06-04. Titel: Controlling over-actuated road vehicles during failure conditions. Mats är för närvarande industrihandledare till doktoranderna Peikun Sun och Mohammad Mehdi Davari. Här har Mats varit värdefull med att formulera industrins problem som avses att lösas med vetenskapliga metoder. Framför allt har han bidragit kring kunskaper inom överaktuerade system, avancerade fordonsmodeller och fälttester samt tolkning av resultat till implementeringsbara lösningar. Mats har dessutom under sin tidigare affilieringsperiod blivit docent i fordonsdynamik.

Mats har bidragit till grundutbildningen på KTH på flera sätt. Under 2014 har han utvecklat laborationer i kursen Vehicle Control (SD2231) gällande bland annat estimering av fordonsdynamiska tillstånd. Han har undervisat i dessa moment under läsåren 2014-15, 2015-16, 2016-17. Vidare har han tagit fram undervisningsmaterial

och föreläser om verifiering av fordonsdynamiska samband inom kursen Fordonsdynamik (SD2225) sedan många år. Han har dessutom bidragit i Perspektivkursen (SD1001) för Farkostteknikstudenter i årskurs 1 där han har handlett projekt som innefattar både experiment, teoribilding, analys, rapportskrivning och muntlig framställning under läsåren 2015-16, 2015-16 samt 2016-17. Han har även bidragit i undervisning inom drivlina i kurserna Fordonssystemteknik (SD2221) samt ett flertal Kandidatarbeten i Fordonsteknik (SA105X). Han har också initierat och handlett ett flertal examensarbeten på Mastersnivå.

Mats har dessutom aktivt bidragit till ett flertal möten mellan medarbetare på KTH Fordonsdynamik och olika verksamheter inom Volvo Cars. Han har dessutom deltagit i ett forskningprojekt med titeln "Safe and energy efficient vehicle designs" som syftar till att förstå hur bilar skall konstrueras för att erbjuda energieffektiv reglering av överaktuerade bilar.

Det är därför ytterst viktigt för oss att behålla det goda samarbetet som vi har upparbetat under många år med Mats Jonasson, genom hans affilierade fakultet.

Med vänliga hälsningar

Annika Stensson Trigell

Professor Annika Stensson Trigell

Lars Drugge

Associate Professor Lars Drugge
Head of SDB

2017-03-01

Skolchef Professor Leif Kari
Skolan för Teknikvetenskap
KTH

Angående rollen som affilierad forskare i Fordonsdynamik

Mitt namn är Mats Jonasson och jag är anställd på Volvo Cars sedan 1998. Nu är jag teknisk expert i fordonsdynamisk reglerteknik. På Volvo Cars tillhör jag en gruppering som ansvarar för konstruktion av fordonsdynamiska funktioner i framtida Volvobilar. Under 2009 disputerade jag inom ämnesområdet fordonsteknik på KTH Fordonsdynamik och 2016 blev jag Docent i fordonsdynamik. Jag har också under perioden 2014-03-01 till 2017-02-28 varit affilierad forskare på KTH Fordonsdynamik.

Jag är intresserad av att fortsätta som affilierad forskare och avsätta 20% av min tid under tre år från och med den 1 mars 2017 inom Fordonsdynamik med särskild inriktning mot innovativa fordonskoncept. Jag kommer att då att fortsätta att engagera mig i KTH industrial faculty inom den strategiska satsningen TRENoP med intention att bidra med kompetens och forskningsresultat för grönare, smartare och säkrare fordonskoncept. Målsättningen är att verka för en adjungerad professur inom området.

Jag tror att min industriella erfarenhet tillsammans med min akademiska färdighet kommer att vara en fördel i min roll som affilierad forskare, då jag kommer att bedriva forskning, forskarhandledning och undervisning.

Vänliga hälsningar

Mats Jonasson

Application for Affiliated Researcher Mats Jonasson

Within the field of *Vehicle Dynamics* with focus on innovative vehicle concepts.

1. Basic information	
1.1.	Name. Mats Jonasson 
1.2.	Date of birth. 690208
1.3.	Male/female. Male
1.4.	Home address and telephone number. Furulundsv. 6, 43340 PARTILLE, 031-444445.
1.5.	Workplace address, telephone number and e-mail address. Volvo Cars, Vehicle Dynamics and Motion Control, dept. 96640, PVV1:1, 40531 Gothenburg, Sweden, 031-592918, mats.jonasson@volvocars.com. KTH, School of Engineering Sciences, Department of Aeronautical and Vehicle Engineering, Research group, Teknikringen 8, 10044 Stockholm, matsjona@kth.se.
1.6.	Current employment with title, subject area and placement. Specify the date of employment. Technical Expert in vehicle dynamics and motion control at Volvo Cars since Mars 2016. Affiliated researcher in vehicle dynamics with focus on innovative vehicle concepts at KTH since Mars 2011.
1.7.	Previous employment (include leave of absence). 1989-1990 Waves AB, design engineer (electrical) 1990-1993 Tele 2, design engineer (electrical) 1997-1998 Semcon, design engineer (powertrain) 1998-2004 Volvo Cars, Electrical Department, design engineer (electrical) 2004-2009 Volvo Cars, Active Safety and Vehicle Dynamics, Industrial PhD student (chassis)
1.8.	Other. Not applicable

2. Education qualification and evaluations	
2.1.	Higher education qualification. Specify year of graduation, type of qualification (for example, Licentiate of Technology, Doctor of Philosophy). Attach grades. 1997 MSc.E.E Chalmers, Gothenburg, Sweden 2007 Tekn. Lic KTH, Stockholm, Sweden 2009 Tekn. Dr KTH, Stockholm, Sweden 2016 Docent KTH, Stockholm, Sweden See Appendix 1 for grades.
2.2.	Qualification required for appointment as a docent. State the year of examination. Attach certificates. Forskarhandledning 3p (LH207V, 2011-06-07) Lärande och undervisning 7.5p (LH201V, 2013-05-16) See Appendix 2 for transcript of records.
2.3.	Evaluation of own science (research council etc.) Not applicable.
2.4.	Previous skilled evidence can be attached to the application (for the last five years). Not applicable.
2.5.	Other. Not applicable.

3. Scientific qualifications

3.1. Describe your research profile (maximum two pages).

Along with the development towards safe and environmentally friendly vehicles, there has been an increasing interest in improved functions of vehicle dynamics. Since conventional chassis are built on a combustion engine base, improvement of vehicle dynamics implies an increased complexity and expensive solutions. Currently, the field maintains significant interest due to the development of hybrid electric vehicles. Here, the electric vehicle becomes an attractive solution due to the opportunity to divide the electric driveline into several electrical machines and allow them to quickly generate torque and revolve independently from each other. If the electrical driveline is distributed closer to the wheels there is a potential to further reduce energy consumption due to less friction losses. Furthermore, when the wheels are allowed to be controlled individually, the trade-off between comfort, safety and energy consumption can more easily be tackled.

One example of a long-term chassis concept, with electrical machines mounted inside the wheel, is the Autonomous Corner Module (ACM). This concept was invented at Volvo Cars in 1998 (see Figure 1a) and further developed by Magna Steyr in collaboration with KTH and Volvo Cars (see Figure 1b). The name "autonomous" indicates that wheel forces and kinematics are individually controlled supporting a common task. This solution also possesses the attribute of modularity, meaning that the one module can be re-used at all four corners and for different vehicle platforms. Figure 1c illustrates the tyre force constrains which are associated to a hybrid vehicle with ACMs.

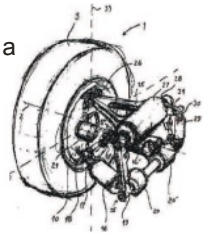
Fig. 1a 

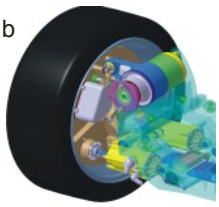
Fig. 1b 

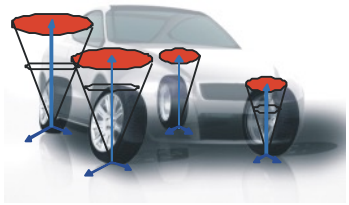
Fig. 1c 

Fig. 1. a) The ACM patent picture from 1998, b) The ACM concept further developed by Magna Steyr, KTH and Volvo Cars in 2007 [16] and c) Illustration of tyre force constraints.

One question that has gained particular attention in the research society is how such concepts should be optimally used. Historically, similar problem has been faced in the aircrafts industry to control the relatively large number of rudder compared with the states that are to be controlled (so called over-actuated systems). Using optimal control theory tyre forces can be allocated to satisfy the remuneration to low energy consumption, low tyre wear and exploitation of tyre-to-road adhesion potential.

With the background above in mind, Mats Jonasson worked as a PhD student in the research project "Autonomous corner modules for hybrid vehicles" at KTH from 2004 to 2009 to give response to the following research question:

How can individual wheel actuators improve vehicle dynamics and safety and how should the actuators then be used?

Mats Jonasson gave answers on possible uses of ACMs and capacity of new vehicle dynamics functions (2005). A control strategy was specifically developed to handle ACMs and similar over-actuated vehicle systems (2005). It was found that this control strategy together with the ACM equipped vehicle have an inherent robustness to handle faults events that threaten vehicle stability (2006). In case of actuator fault, the control of the corresponding may be lost. However, the developed mechatronic system admits the remaining wheels to counteract the effect of the non-functional wheel. Thereby, vehicle stability is ensured without any additional need of extra hardware and case-specific fault-handling strategies.

The ACM control strategy was further developed by Mats Jonasson to allocate vertical forces between the four wheels (2006). It was also found that ACM utilize the available friction between road and tyre better than conventional vehicles. One key finding was the unsymmetrical left-right longitudinal tyre force allocation that increases the margins towards the friction boundary. Owing to the rear-wheel steering ability of the ACMs, it was also found that the mixing between translation and rotational motion during cornering can be controlled to increase the grip.

In collaboration with Magna Steyr, the ACM was further developed together with KTH and Volvo Cars to

prepare for industrialization (2006-2009). Basis for a complete rolling prototype Autonomous corner vehicle was delivered.

An electromechanical wheel suspension to the ACM was developed by Mats Jonasson (2007). To evaluate the feasibility of electromechanical dampers in vehicles, a dimensioning method was also developed. By adapting the dimensioning method already during the development process of the vehicle, the compromise between comfort, handling and energy dissipation can be controlled.

A method to evaluate the potential of generating global vehicle forces was developed by Mats Jonasson (2009). This approach is specifically designed to handle all types of over-actuated vehicle systems. After this method was used, important differences were revealed in the ways in which differently equipped vehicle configurations could be actuated.

A quantification of the potential for emergency avoidance manoeuvres of differently actuated vehicles was studied by Mats Jonasson (2009). Friction brakes are most important in such critical manoeuvres. Nevertheless, wheel individual drive and steering on both axles do improve the potential to perform emergency avoidance manoeuvres safely. Such vehicles in real-life traffic would manage critical situations to a larger share with an increased entry speed, assuming a certain frequency distribution of vehicle speed.

The research activates after PhD have primarily covered the fields of over-actuated systems, fault-tolerant control and post-impact control.

Since over-actuated vehicle concepts are equipped with many actuators, those concepts are exposed to high risks of hazards and failure modes. Based on the work presented by Jonasson and Wallmark 2006 a joint research project, "Fault-tolerant over actuated HEVs", was formulated, involving both Jonasson at Volvo Cars, KTH Vehicle Dynamics (Annika Stensson Trigell) and KTH Electrical machines and power electronics (Oskar Wallmark). The project was approved by SHC - Swedish Hybrid Vehicle Centre in 2010 Within the PhD project, the hazards and failure modes have been be classified and analysed. Possible consequences on the dynamic behaviour of the vehicle caused by the identified faults have been analysed, and solutions on to how to compensate for the occurring faults has been developed. The solutions of recovery will be depending on which sensors and actuators that are available. The vehicle control strategy will also be depending on actual type of failure mode. Mats Jonasson, who is an co-supervisor to PhD student Daniel Wanner (lic tech 2013, PhD 2015) in this project, has contributed with control algorithms to compensate for the fault and has taking part of writing paper (2010-2014).

An optimization study was performed (2012) to investigate whether the vehicle control method "Control allocation" is optimal. Control allocation allows the distribution of actuator requests to be independently controlled from the control of the car body itself. This was done by formulating a cost function of tracking error along a reference path and applying an open-loop optimization with the tool "Optimica". The result was evaluated against the control requests from the control allocator.

Mats Jonasson has been an co-supervisor to the PhD student Derong Yang (PhD 2013) in the project "Post-impact stability control", which aims to autonomously control a car after an impact to avoid a second collision. One part of the project was done to understand the character of the vehicle's dynamics after first impact directly after contact. It was found that the optimal control strategy highly depends on the type of vehicle motion state that is generated through the collision. A control strategy using Hamiltonian optimization was developed and Mats has contributed to the problem formulation and has taking part of writing papers (2010-2014).

Jonasson has also been an co-supervisor to the PhD student Johannes Edrén (PhD 2014) in a PhD project "Generic vehicle motion modelling and control for enhanced driving dynamics and energy management". This project aims to understand how over-actuated vehicle concepts should be utilized in the context that sensors actuators not are ideal, i.e. they have constraints and uncertainties. The project has built a down scaled prototype vehicle with ACMs equipped with electrical servo-motors. The project has for example shown that active suspension can be used to influence lateral and longitudinal dynamics, e.g. reducing stopping distance. Mats has contributed with modelling expertise and has taking part in writing papers (2010-2014).

3.2. Describe your planned research activities (maximum two pages).

Here, a description of three planned research directions is described:
1.
Driver enjoyment, which is the human's feeling of happiness and perception of driving as being a pleasure,

plays a viable role for customers when they are evaluating which car to buy. Driver enjoyment is also an important factor to further improve the interaction between the driver and the vehicle in order to increase safety and satisfy customer demands. Generally, the research findings in the literature about driver enjoyment are rare. One reason is that the field is multi-disciplinary and involves psychology, vehicle design, vehicle dynamics, ergonomics etc. Mats Jonasson has initiated a research project in this field together with KTH Vehicle Dynamics, LTU Engineering Psychology and Volvo Cars. Volvo Cars has approved an industrial PhD student on this topic and a research application has recently been submitted to "Stiftelsen för Strategisk Forskning" with the aim to investigate driver enjoyment and how the vehicle should be designed and controlled to get the desired enjoyable attribute.

2.
During Mats PhD studies, a control strategy for ACMs was developed and tested by using simulation by high-fidelity vehicle models. At that time (2004-2009) there was not such real world vehicle available. However, KTH Vehicle Dynamics have since 2014 together with other research groups at KTH, within ITRL - Integrated Transport Research Lab, developed and built a prototype vehicle ready for test. It is therefore strongly interesting to further test and develop control algorithms for that vehicle with focus on normal and energy efficient driving. We have got approved a SHC project "Säkra och energieffektiva fordonskonstruktioner" where Jonasson is working with control algorithms for both individual torque and steering. Implementation and pilot tests have been performed by Jonasson during spring 2015.

3.
A number of papers have shown how a vehicle should be controlled optimally along a predefined patch using steering and individual braking. One method is to employ numerical optimisation to get optimal sequences of front steering angles and wheel torques. These results can be interpreted as how an optimal driver should steer and how brake pressures should be best distributed among the wheels. However a real human driver is not perfect e.g. he/she has a significant latency and limitation in bandwidth and steering/braking effort. On top on that, steering/braking will not be optimal due to restriction of the human's preview control capabilities. Hence, the optimal result will not be achieved in practice as long a human being drive the vehicle. A hypothesis is that a skilled and prepared driver follows a path very well with front steering and brake-pedal induced braking only and that little additional improvement can be gained from e.g. individual wheel torque control (wheel torque control will however be necessary for lateral stability). On the contrary, a bad driver would then gain more benefit from control assistance through individual wheel torque control. As an example it is expected that the maximum lateral acceleration will vary dependent on driver limitations. The proposed research activity aims to find evidence and quantitative measures for the hypothesis described above. The work addresses questions of type "How to control vehicle when the driver has a variety of driver skill", "How much can be gained when the driver has a variety of driver skill".

3.3. Describe your publications in a numbered list. If there are fewer than ten authors, all co-authors are specified in published order of names. Otherwise the first author, the applicant's name and the number of co-authors are stated. Describe the articles reviewed by experts/referees in international journals.

Papers published in international reputed periodicals which have been subject to referee´s assessment

1. M. Jonasson, S. Zetterström and A. S. Trigell, 'Autonomous corner modules as an enabler for new vehicle chassis solutions', FISITA Transactions 2006, paper F2006V054T, 2006.

2. M. Jonasson and O. Wallmark, 'Stability of an electric vehicle with permanent-magnet in-wheel motors during electrical faults', The World Electric Vehicle Association Journal, Vol. 1, pp. 100–107, 2007.

3. M. Jonasson and O. Wallmark, 'Control of electric vehicles with autonomous corner modules: implementation aspects and fault handling', International Journal of Vehicle Systems Modelling and Testing, Vol. 3, No. 3, pp. 213–228, 2008.

4. M. Jonasson and J. Andreasson, 'Exploiting autonomous corner modules to resolve force constraints in the tyre contact patch', International Journal of Vehicle System Dynamics, Vol. 46, No. 7, pp. 553–573, 2008.

5. M. Jonasson and F. Roos, 'Design and evaluation of an active electromechanical wheel suspension system', Journal of Mechatronics, Vol. 18, Issue 4, pp. 218–230, 2008.

6. J. Backmark, E. Karlsson, J. Fredriksson and M. Jonasson, 'Using future path information for

improving stability of an overactuated vehicle', International Journal of Vehicle Systems Modelling and Testing, Vol. 4, No. 3, pp. 218–231, 2009.

7. M. Jonasson, J. Andreasson, A. S. Trigell and B. Jacobson, 'Utilisation of actuators to improve vehicle stability at the limit: from hydraulic brakes towards electric propulsion', Journal of Dynamic Systems, Measurement and Control, Vol. 133, Issue 5, 27 July 2011.

8. M. Jonasson, J. Andreasson, B. Jacobson and A. S. Trigell, 'Global force potential of over-actuated electric vehicles', International Journal of Vehicle System Dynamics, Vol. 48, No. 9, pp. 983–998, 2010.

9. D. Yang, T. J. Gordon, B. Jacobson, M. Jonasson and M Lidberg, 'Optimized brake-based control of path lateral deviation for mitigation of secondary collisions', Proceedings of the Institution of Mechanical Engineers, Part D, Journal of Automobile Engineering, Vol. 225, Issue 12, December 2011.

10. D. Yang, T.J. Gordon, B. Jacobson and M. Jonasson, 'Quasi-linear optimal path controller applied to post-impact vehicle dynamics', IEEE Transactions on Intelligent Transportation Systems, Vol. 13, Issue 2, pp. 1586-1598, 2012.

11. J. Edrén, P. Sundström, M. Jonasson, B. Jacobson, J. Andreasson and A. S. Trigell. 'Road friction effect on the optimal vehicle control strategy in two critical manoeuvres', International Journal of Vehicle Safety, Vol. 7, No. 2, 2014.

12. D. Yang, T. J. Gordon, B. Jacobson and M. Jonasson, 'A nonlinear post-impact path controller based on optimized brake sequences', International Journal of Vehicle System Dynamics: International Journal of Vehicle Mechanics and Mobility, Vol. 50, Sup. 1, pp. 131-149, 2012.

13. D. Yang, T. Gordon, B. Jacobson and M. Jonasson, 'Closed-loop controller for post-impact vehicle dynamics using individual wheel braking and front axle steering', International Journal of Vehicle Autonomous Systems, Vol. 12, No.2, pp. 158 – 179, 2014.

14. D. Yang, B. Jacobson, M. Jonasson and T.J. Gordon, 'Minimizing vehicle post-impact path lateral deviation using optimized braking and steering sequence', International Journal of Automotive Technology, Vol. 15 (1), pp. 7-17. 2014.

15. D. Yang, T. Gordon, B. Jacobson and M. Jonasson. 'An optimal path controller minimizing longitudinal and lateral deviations after light collisions', Transactions on Intelligent Transportation Systems, Vol.13, No. 4, 2012.

16. J. Edrén, M. Jonasson, J. Jerrelind, A. S. Trigell and L. Drugge, 'Utilization of optimization solutions to control active suspension for decreased braking distance', International Journal of Vehicle System Dynamics: International Journal of Vehicle Mechanics and Mobility, 2014.

17. D. Wanner, L. Drugge, A. S. Trigell, O. Wallmark and M. Jonasson, 'Control allocation strategies for an electric vehicle with a wheel hub motor failure'. Accepted for publication in International Journal of Vehicle Systems Modelling and Testing, 2014.

18. A. Albinsson, F. Bruzelius, P. Petterson, M. Jonasson and B. Jacobson 'Inertial parameter estimation for vehicles with electric propulsion', accepted for publication in the Proc. IMechE, Part D: Journal of Automobile Engineering, 2015.

19. D. Wanner, L. Drugge, A. S. Trigell, O. Wallmark and M. Jonasson, 'Control allocation strategies for an electric vehicle with a wheel hub motor failure', submitted to the International Journal of Vehicle Systems Modelling and Testing, July 2014.

Conference proceedings, full articles with peer-reviewed abstracts

20. O. Wallmark and M. Jonasson, 'Vehicles with autonomous corner modules - control and fault handling aspects', Proceedings of the Program Review Meeting - MIT Industry Consortium on

Advanced Automotive Electrical/Electronic Components and Systems, Seattle, U.S.A., 2007.

21. J. Andreasson and M. Jonasson, 'Vehicle model for limit handling - implementation and validation', Proceedings of the 6th Modelica Conference, Bielefeld, Germany, 2008.

22. M. Jonasson, J. Andreasson, B. Jacobson and A. S. Trigell, 'Modelling and parameterisation of a vehicle for validity under limit handling', Proceedings of the 9th International Symposium on Advanced Vehicle Control, Vol. 1,pp. 202–207, Kobe, Japan, 2008.

23. J. Andreasson, M. Jonasson and H. Tummescheit, 'Modelica-simulation aktiver sicherheitsscenarios mit validierten fahrzeugmodellen in dymola', Proceedings of the ASIM-Workshop 2009, Dresden, Germany, 2009.

24. J. Edrén, M. Jonasson, A. Nilsson, A. Rehnberg, F. Svahn, J. Andreasson and A. S. Trigell, 'Modelica and Dymola for vehicle dynamics applications at KTH', 7th Modelica Conference 2009, Como, Italy, 2009.

25. J. Edrén, M. Jonasson, A. S. Trigell, J. Jerrelind and L. Drugge, 'The development of a down-scaled over-actuated vehicle equipped with autonomous corner module functionality', FISITA World Automotive Congress, Hungary, Budapest, 2010.

26. D. Yang, T. J. Gordon, M. Lidberg, M. Jonasson and B. Jacobson, 'Post-impact vehicle path control by optimization of individual wheel braking sequences'. Proceedings of 10th International Symposium on Advanced Vehicle Control, Loughborough, United Kingdom, 2010.

27. P. Sundström, M. Jonasson, J. Andreasson, A. S. Trigell and B. Jacobson. 'Path and control optimisation for over-actuated vehicles in two safety-critical maneuvers', Proceedings of 10th International Symposium on Advanced Vehicle Control, Loughborough, United Kingdom, 2010.

28. M. Jonasson, J. Andreasson and A.S Trigell, 'Evaluation of instantaneous force allocation compared to trajectory optimization', 11th International Symposium on Advanced Vehicle Control, Seoul, South Korea, 2012.

29. D. Wanner, J. Edrén, M. Jonasson, O. Wallmark, L. Drugge and A. S. Trigell 'Fault-tolerant control of electric vehicles with in-wheel motors through tyre-force allocation', 11th International Symposium on Advanced Vehicle Control, Seoul, South Korea, 2012.

30. J. Edrén, M. Jonasson, J. Jerrelind and A. S. Trigell, 'Utilization of vertical loads by optimization for integrated vehicle control', 11th International Symposium on Advanced Vehicle Control, Seoul, South Korea, 2012.

31. A. Albinsson, F. Bruzelius, M. Jonasson and B. Jacobson, 'Tire force estimation based on the recursive least square method utilizing wheel torque as a sensor and validation in simulations and experiments', 12th International Symposium on Advanced Vehicle Control, Tokyo, Japan, 2014.

32. A. Gurov, A. Sengupta, M. Jonasson and L. Drugge, 'Collision avoidance driver assistance system using combined active braking and steering', 12th International Symposium on Advanced Vehicle Control, Tokyo, Japan, 2014.

33. D. Yang, T.J. Gordon, M. Jonasson and B. Jacobson, 'Application of an optimal path controller on curved roads after collisions', 12th International Symposium on Advanced Vehicle Control, Tokyo, Japan, 2014.

34. D. Yang, X. Xie, F. Bruzelius, B. Augusto, B. Jacobson and M. Jonasson, 'Evaluation of post impact control function with steering and braking superposition in high-fidelity driving simulator', to be presented at the International Symposium on Future Active Safety Technology toward zero-traffic-accident (FAST-zero), Gothenburg, Sweden, 2015.

35. M. Mattsson, R. Mehler, M. Jonasson and A. Thomasson, 'Optimal Model Predictive Acceleration Controller for a Combustion Engine and Friction Brake Actuated Vehicle', 8th IFAC International Symposium on Advances in Automotive Control, Norrköping, Sweden, 2016.

36. M. M. Davari, M. Jonasson, J. Jerrelind, A. S. Trigell and L. Drugge, 'Rolling loss analysis of combined camber and slip angle control', 13th International Symposium on Advanced Vehicle Control, Munich, Germany, 2016.

37. M. Jonasson and M. Thor, 'Steering Redundancy for Self-Driving Vehicles using Differential Braking', 13th International Symposium on Advanced Vehicle Control, Munich, Germany, 2016.

38. Derong Yang, Mats Jonasson, Tomas Halleröd and Regina Johansson, 'Evaluation of an Evasive Manoeuvre Assistance System at Imminent Side Collisions', 13th International Symposium on Advanced Vehicle Control, Munich, Germany, 2016.

3.4. Other publications including books and patents.

Licentiate Thesis
M. Jonasson, 'Aspects of autonomous corner modules as an enabler for new vehicle chassis solutions', Licentiate thesis in Vehicle Engineering, TRITA-AVE2006:101, KTH Vehicle Dynamics, Stockholm, Sweden, 2007.

Doctoral Thesis
M. Jonasson, 'Exploiting individual wheel actuators to enhance vehicle dynamics and safety in electric vehicles', Doctoral thesis in Vehicle Engineering, TRITA-AVE 2009:33, KTH Vehicle Dynamics, Stockholm, Sweden, 2009.

Patents

1. 'Antenna Unit', No. US6396447, 27 Sep 1999. Granted.
   This patent concerns a new way of integrating vehicle antennas and receivers in a module positioned in the vehicle roof (see Fig. 2). The integration admits antennas to be connected to receivers without the need for any antenna amplifiers. Since the module replaces a distributed system installation in the vehicle, the manufacturing process is substantially simplified. The patent was set into production in Volvo XC90 in 2002.

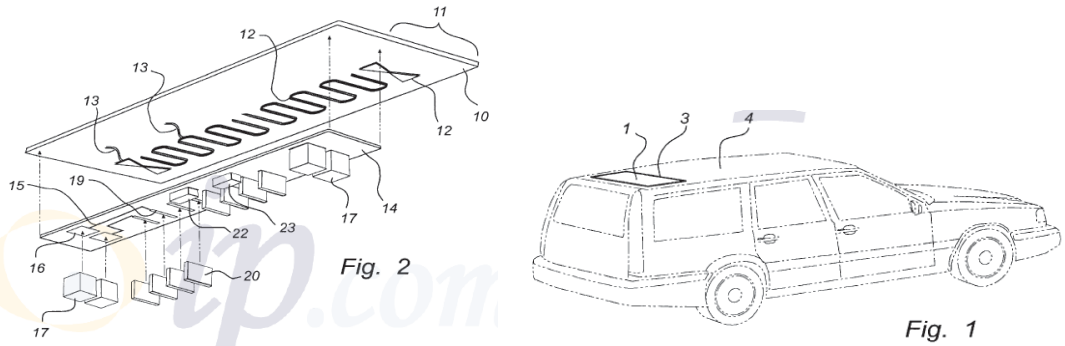


Fig 2: Illustrations from invention No. US6396447 [http://ip.com/patent/US6396447].

2. 'A steering system for a vehicle', No. EP1795433 and EP1795433, 9 Dec 2005.
   This invention relates to a control strategy where the rear wheels are steered in order to increase the lateral acceleration gradient during an evasive driving situation. The strategy requires rear axle steering and is based on cornering by putting energy into translational motion rather than yawing motion.

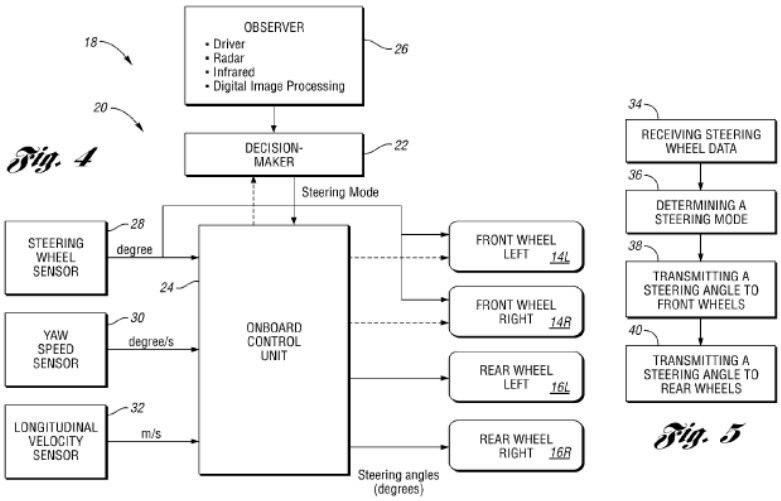


Fig 3: Illustration from invention No. EP1795433
[http://www.europatentbox.com/patent/EP1795433A1/abstract/655704.html].

3. 'A braking system and a method for braking a vehicle', No. EP1935737, 21 Dec 2006.
Today, electrical machines are mechanically disconnected by clutches to the wheels during ABS braking. This invention shows instead how electrical machines for propulsion can be used to enhance ABS braking. The electrical machines allow wheel torques to be quickly actuated in order to reach and stay at maximum longitudinal brake force.

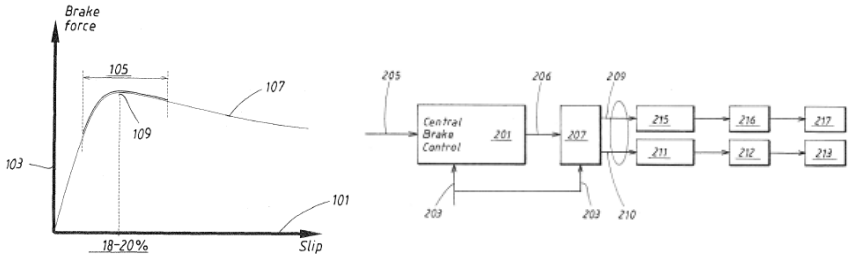


Fig 4: Illustration from invention No. EP1935737
[http://www.europatentbox.com/patent/EP1935737A1/abstract/407259.html].

4. 'Method and arrangement for controlling a suspension of a vehicle wheel', No. EP1935679 and EP1935679, 21 Dec 2006.
This invention relates to an arrangement to controlling a vehicle suspension. The arrangement is a combined unit of a damper and a spring. They have each an electrical machine connected to provide active damping as well as levelling. The unit is based on a rotational mechanism connected mechanically to an upper arm, which is fixed at the wheel hub.

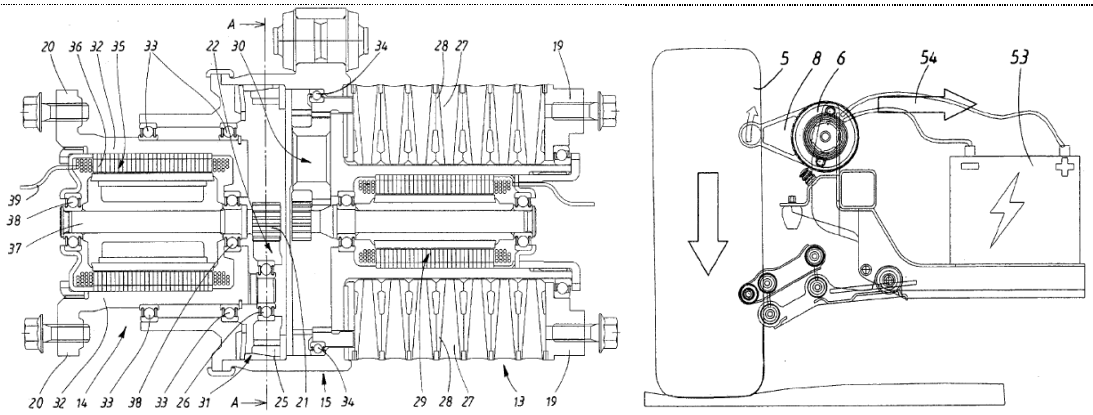


Fig 5: Illustration from invention EP1935679
[http://www.europatentbox.com/patent/EP1935679B1/abstract/794184.html]

5. Method and arrangement for assisting a driver of a vehicle to turn the vehicle when driving during glare ice conditions, US8738265 B2, patent granted 27 Aug 2014.

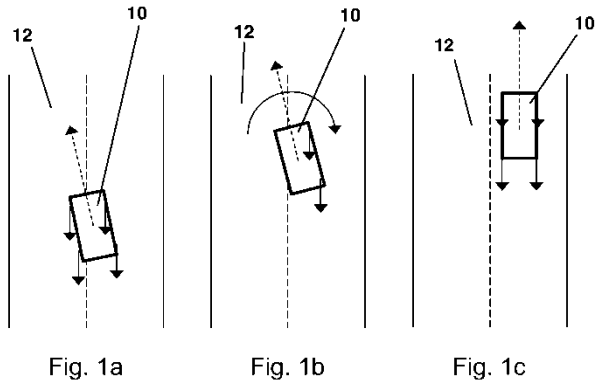
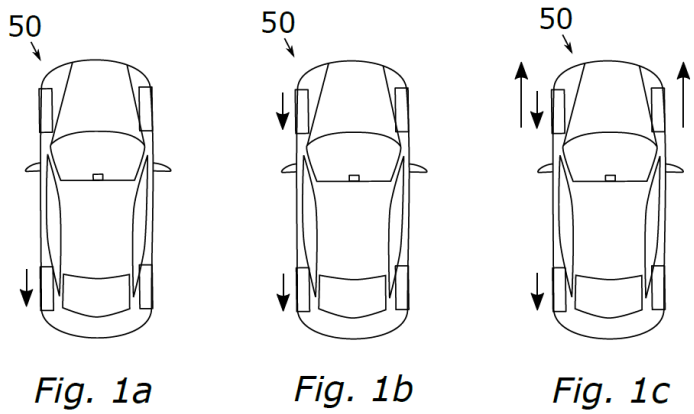


Fig. 6: Illustration from invention US8738265

6. Vehicle tyre to road friction value estimation arrangement, P1868EP00 (2013-12-16, pending). This patent application shows how the friction coefficient can be estimated during a collision.
7. Threat based feedforward control of a vehicle's understeering, P1919EP00. This patent application (2014-03-18, pending) shows how a vehicle could be controlled to reduce understeering during a threat of collision.
8. Differential braking for steering redundancy, P2049EP00 (2015-05-05 pending), This patent application shows how differential braking can be used as redundancy for steering system.
9. Method and apparatus for a critical evasive manoeuvre assist system, P2061EP00 (2015-05-20 pending). This patent application shows the principle behind a steering assist function.
10. Simultaneous vehicle dynamics state estimation using pitch-rate sensor, P2187EP00, 16193753.7 (2016-10-13)
11. Tyre to road friction estimation arrangement by exiting wheel torques, P2053EP00, EP15172369.9, (2015-06-17, pending). This patent application shows how friction can estimated by using propulsion and braking simultaneously on different axles.
12. Method to Estimate Road Friction Using Wheel Torque Control and Rack Force Sensing (P2189EP00), 16193749.5, 2016-10-13
13. Method to Estimate Road Friction Using Wheel Torque Control and Rack Force Sensing (



P2189EP00)

Fig. 7. Illustration of wheel torque actuation in invention P2049EP00

3.5. Describe the funds which you have received as principal or co-applicant over the past five years. State the principal and co-applicants. Attach certificates.

- Funds from research councils etc.
- Funds from the EU and foundations.
- Funds from trade and industry as well as authorities.
- Other funds.

As affiliated researcher to KTH Vehicle Dynamics Jonasson have been involved in formulating and writing research proposals.

SHC project Generic vehicle motion modelling and control for enhanced driving dynamics and energy management. Project duration: 2008-02 to 2014-06, funding 4500 kkr.

SHC project Fault-tolerant over actuated HEVs. Project duration 2009-08 to 2015-07 , funding 4500 kkr.

SHC project Säkra och energieffektiva fordonskonstruktioner. Project duration 2014-10 - 2015-06, funding 255 kkr.

Several applications where Jonasson is co-applicant have been submitted during 2014-2015.

3.6. Describe active participation in national and international conferences over the past five years. State activities, such as plenary lectures, invited lectures, articles or items, chairmanship, session organisation etc.

1. Presentation of paper at Fisita World Automotive Congress, Yokohama, Japan, Oct 22-27, 2006.
2. Presentation of paper at Electric Vehicle Symposium 22, Yokohama, Japan, Oct. 23-28, 2006.
3. Invited as presenter to Research and Development of Hybrid Vehicles in Japan and Sweden, Gothenburg, Sweden, Nov. 29, 2006.
4. Invited presentation at Review Meeting - MIT Industry Consortium on Advanced Automotive Electrical/Electronic Components and Systems, Seattle, U.S.A., 2007.
5. Presentation of paper at the 9th International Symposium on Advanced Vehicle Control, Kobe, Japan, Oct. 6-9, 2008.
6. Invited as a presenter to Energisystem i vägfordon, Skövde, Sweden, Nov. 19-20, 2008.
7. Keynote speech at the 21st International Symposium on Dynamics of Vehicles on Roads and Tracks, Stockholm, Sweden, Aug 17-21, 2009.
8. Principal session chair and presenter of paper at the 10th International Symposium on Advanced Vehicle Control, Loughborough, United Kingdom, Aug. 22-26, 2010.

	9. Presenter of three papers at the 11th International Symposium on Advanced Vehicle Control, Seoul, South Korea, Sep. 8-12, 2012. 10. Presenter of "Evasive Manoeuvre Assist" at Vehicle Dynamics in a cooperative environment, Swedish Vehicular Engineering Association, May 27, 2014, Södertälje, Sweden. 11. Presenter of one paper at the 12th International Symposium on Advanced Vehicle Control, Seoul, Tokyo, 2014. 12. Presenter of "PISC- Post Impact Stability Control (Pre-Crash)" at Safer project day 2015, Gothenburg, Sweden, 2015.
3.7.	National and international prizes. **Best paper award** A. Albinsson, F. Bruzelius, M. Jonasson and B. Jacobson, 'Tire force estimation based on the recursive least square method utilizing wheel torque as a sensor and validation in simulations and experiments', 12th International Symposium on Advanced Vehicle Control, Tokyo, Japan, 2014.
3.8.	Membership in academies etc. Member in SVEA - Swedish Vehiclular association Member in IAVSD - International Association of Vehicle System Dynamics
3.9.	Reviewer experiences/expert assignments • Editorial/advisory board in international journals. • Referee assignments for journals. State the journals and number of assignments per year. • Assignments as faculty examiner. • Expert assignments, such as employment cases and other assignments. Mats Jonasson is a member in Editorial board of International Journal of Vehicle Systems Modelling and Testing since September 2011. He reviews approximately two journal papers per year.
3.10.	Other scientific work • Employment. • Creation of, participation and collaboration in international networks. • Scientific qualifications in trade and industry as well as authorities. • Other scientific leadership or development work which you would like to highlight. Not applicable
4. Teaching qualifications (maximum 12 pages excluding appendices)	
4.1.	Briefly describe your profile as a teacher (maximum half a page). My teaching is within the field of road vehicle dynamics. It covers vehicle modelling, simulation, state estimation and control. I teach students at KTH at different stages as well as internally at Volvo Cars. In addition to my teaching, I am supervising PhD students and Master thesis students. Owing to my employment in academia and industry, my view of learning is associated to applied technical knowledge but in the light of scientific methods. My teaching style is problem based, which means emphasizing the underlying problem that should be solved and thereby increase students motivation for learning.
4.2.	List your experiences of teaching at first cycle, second cycle and third cycle and for further education. You should add comments below point 4.5. **Teaching at KTH during the period 2004 to 2009:** Approximately 10% of this time has been spent on teaching and contact with students. Mats Jonasson took part as a teacher in the following parts: • The course "Vehicle engineering for a better environment" (KTH, 4B1424, 5 credits), which belonged to the Green Vehicle National University Programme. Teaching included leading a laboratory exercise, leading one exercise in power train and leading one project assignment. The laboratory exercise gave insight in emissions of HC, CO and NOx as well as fuel consumption for a combustion engine. Measurements were done in a laboratory with a gasoline engine with a catalytic converter. Students wrote reports that were corrected firstly by exchanging the reports in between the students. Finally, Mats Jonasson judged and corrected the reports. Course assignment through Bilda.

- The course "Fördjupningsarbete i fordonsteknik" (KTH, 4B1430, 10 credits). Mats Jonasson was leading one exercise in power train and leading one project assignment. Students wrote reports that were corrected by Mats Jonasson. Course assignment through Bilda.
- The course "Bachelor Degree project in vehicle engineering" (KTH, SA105X, 15 credits, first cycle). Mats Jonasson was a supervisor for three different projects in the area of regenerative braking and energy consumption of electrical steering system. Course assignment through Bilda.
- The course Vehicle dynamics (KTH, SD2225, 11 credits, second cycle). Mats Jonasson held lectures about vehicle modelling and validation. This course gives knowledge in what vehicle models are typically used and how subsystems and complete vehicles are modelled and validated depending on the particular purposes. Particular attention is paid on how parameters to the models are determined. Course assignment through Bilda.

Teaching after the PhD degree (2009-2015):

- Mats Jonasson is a guest lecturer (2009-2017) in "Vehicle dynamics" (KTH, SD2225, 11 credits, second cycle, approx. 20 students) in vehicle modelling and validation. This is a course for students at the fourth year on the Master level. The overall aim is to give the student a deeper insight in mathematical modeling, computer based simulation, measurements and analysis of a vehicle's motion. Here I teach about how mathematical models can be validated such that they perform equally as the real word vehicle. Course assignment through Bilda.
- Mats Jonasson has contributed to the course design to a completely new course "Applied Vehicle Dynamics Control" (KTH, SD2231, 7.5 credits, second cycle) which started 2014. The course aims to give fundamental knowledge within vehicle dynamics control and vehicle state estimation. Mats have designed a laboratory exercise for vehicle state estimation. Mats is also one of the guest lecturers in the course. Course assignment through Bilda.
- Mats Jonasson is a guest lecturer (2014-2016) in (KTH, SD2231, 7.5 credits, second cycle, approx. 20 students). Mats gives an introductory lecture about vehicle dynamics control in cars.
- Mats Jonasson is a laboratory assistant (2014-2016) in (KTH, SD2231, 7.5 credits, second cycle, approx. 20 students).
- Mats Jonasson has been the main lecturer for the technical project (2014-2017) in the course "Vehicle Engineering" (KTH, SD1001, 9 credits, first cycle) for the students that have selected this road vehicle project. Mats have given lectures in vehicle dynamics theory and a laboratory exercise with a radio controlled down scaled car. Students have presented reports orally and in written form. Course assignment for the whole course in Bilda and the technical project by distributed questionnaire.

Teaching aid production and development

Mats Jonasson has contributed to the design of a laboratory tutorial in the course "Applied Vehicle Dynamics Control" (KTH, SD2231, 7.5 credits, second cycle) which started 2014. The laboratory covers the field of state estimation, and in particular, side-slip estimation of vehicles.

Collaboration within the education programme

Jonasson contributes to the "civilingenjörsprogrammet i Farkostteknik" all the way from year 1, through year 3, 4 and 5 to Master thesis supervision.

In the Master programme in Vehicle Engineering, Jonasson contributes in many courses, se the previous explanation.

Supervision of bachelor and master thesis

- Johan Backmark and Erik Karlsson, "Trajectory optimisation for overactuated vehicles", Master Thesis (30 credits) in Electrical Engineering, Chalmers University of Technology, 2008. Mats Jonasson was main supervisor and Jonas Fredriksson, Chalmers, was examiner.
- Mattias Forslund and Cedric Nyberg, "Energiförbrukning i ACM system", Bachelor thesis (15 credits) in Vehicle Engineering, KTH, 2008. Mats Jonasson was main supervisor and Annika Stensson Trigell, KTH, was examiner.
- Kristian Ahlberg and Ted Holmberg, "Regenerativ bromsning – en analys av regenerativ bromsning med hjulmotorer", Bachelor thesis (15 credits) in Vehicle Engineering, KTH, 2009. Mats Jonasson was main supervisor and Annika Stensson Trigell, KTH, was examiner.
- Sofie Jarelius and Samuel Holt, "Hjulmotorer i hybridfordon – fördel vid regenerativ bromsning", Bachelor thesis (15 credits) in Vehicle Engineering, KTH, 2009. Mats Jonasson was main supervisor and Annika Stensson Trigell, KTH, was examiner.

- Payam Maroufi and Solayman El Masoudi, "En lovande teknik – hybridbil" , Bachelor thesis (15 credits) in Vehicle Engineering, KTH, 2012. Mats Jonasson was main supervisor and Annika Stensson Trigell, KTH, was examiner.
- Abhinav Sengupta and Alexey Gurov, "Evaluating the effectiveness of collision avoidance functions using state-of-the-art simulation tools for vehicle dynamics", Master Thesis (30 credits) in Vehicle Engineering, KTH, 2013. Mats Jonasson was main supervisor and Lars Drugge, KTH, was examiner.
- Ida Petersson and Johanna Risö, "Automotive path following using model predictive control", Master Thesis (30 credits) in Signals and Systems, Chalmers, 2014. Mats Jonasson was main supervisor and Bo Egart, Chalmers, was examiner.
- John Sedin, "Analys av varför bilar styr fram när båtar och flygplan styr bak", Bachelor thesis (15 credits) in Vehicle Engineering, KTH, 2014. Mats Jonasson was main supervisor and Annika Stensson Trigell, KTH, was examiner.
- You Wang and Lokur Preshant, "Driver skill influence on effectiveness of evasive manoeuvre assist functions", Master Thesis (30 credits) in Vehicle Engineering, KTH, and Signal and Systems, Chalmers, 2015 (ongoing). Mats Jonasson is main supervisor and Lars Drugge, KTH, and Jonas Fredriksson, are examiners.
- Rasmus Mehler and Mathias Mattson, "Optimal vehicle speed control using a predictive controller for an overactuated vehicle", Master Thesis (30 credits) in Vehicular Systems, LiU, 2015. Mats Jonasson is main supervisor and Lars Eriksson, LiU is examiner.
- Rudrendu Shekar, "Stability Analysis for Friction Estimation using Active Tire Excitation", Master Thesis (30 credits) in Vehicle Engineering, KTH, Mats Jonasson is main supervisor and Lars Drugge, KTH, is examiner 2016 (ongoing).

Supervision of PhD students

- Mats Jonasson has been a co-supervisor as well as industrial advisor and project leader for Derong Yang at Chalmers, Gothenburg. Her PhD project "Enhanced post-impact stability control" was started 2009 and Derong defended her dissertation in 2013.
- Mats Jonasson has been a co-supervisor and an industrial advisor to Johannes Edrén at KTH Vehicle Dynamics. His PhD project "Generic vehicle motion modelling and control for enhanced driving dynamics and energy management" started in 2008 and Johannes defended his dissertation in December 2014.
- Mats Jonasson is currently a co-supervisor and an industrial advisor to Daniel Wanner at KTH Vehicle Dynamics. His project "Fault-tolerant over actuated HEVs" started in 2010 and Mats Jonasson was engaged in the definition of the project. Two papers written by Mats Jonasson and Oskar Wallmark initiated the embryo to the projects. PhD is planned for 5 June 2015.
- Mats Jonasson is a co-supervisor as well as project leader for Anton Albinsson at Chalmers, Gothenburg. His PhD project "TorqSens" was started 2013 and is ongoing.

Teaching activity outside the university and higher education institution

- Mats Jonasson is also from 2010 appointed as a teacher in an internal course at Volvo Cars. The course, Active Safety & Chassis School (ENG00008), is arranged by Volvo Cars and is held a couple of times every year. Typically, the class has 25 students from different part of the company. Teaching is performed in the area of vehicle control and includes the following parts:
  - Trends and functional architecture within vehicle control
  - Vehicle dynamics theory
  - Tyre characteristics
  - Actuators for motion control
  - Vehicle control algorithms

Education and outreach presentations

- "Volvo styr bilen med alla fyra hjulen". Magazine Ny Teknik, 2006, Accessable through internet http://www.nyteknik.se/nyheter/it_telekom/allmant/article247054.ece
- "Vatten i däcket fäller ut dubben", Magazine Ny Teknik, 2015, Accessable through internet http://www.nyteknik.se/nyheter/fordon_motor/bilar/article3887160.ece
- "Volvo Cars: active safety", Dassault Systèmes Contact Mag, No. 9, 2008, http://www.modelon.com/fileadmin/user_upload/Products/DS/Dymola/References/Dymola_Volvo.pdf

Electronic teaching
Not applicable

Other teaching qualifications, for example, prizes and awards
Not applicable

4.3. Theoretical knowledge.

- Describe your insights into teaching theory.

One of my expectations of the courses in teaching and supervision was to understand what a good teacher/supervisor is. It turned out that this was not obvious. Many styles could be considered as good. It was also obvious from speeches and fruitful discussions that there is a wide diversity of different successful styles.

The courses also gave me insights in the diversity of traditions in different research fields. I felt that this was problematic for ethical considerations. Acceptable behaviour in one field could be directly unacceptable in another field. I appreciated, as one example among many, the fruitful discussions about student's lack of self confidence, which was shown to be a relatively common problem. This area, and many more, was discussed during the lectures. Group discussions were very valuable in the courses since they contributed with many different perspectives and solutions of supervision and teaching approaches and problems.

The pedagogic education I have passed have provided me with efficient tools for understanding and increase students learning. Owing the education, I have picked up principles for different appropriate learning activities, which results in more active and communicative students. Regarding supervision of students, I have a deeper understanding in how to foster students to work independently.

Finally, an important insight is the need to constantly evaluate my own communication ability with students and have an open mind set. That became clear during my teaching in SD1001 2014/2015, where one of my student is deaf and an interpreter preceded our communication.

Teaching education (list of courses and other relevant education activity)

- Fundamental communication and teaching course, LH200V, 2 credits
- Doctoral supervision, LH207V, 3 credits, 2011
- Learning and teaching, LH201V, 7.5 credits, 2013

See Appendix 2 for Official transcript of records.

4.4. Approach. Describe your personal teaching basic outlook as a teacher and supervisor (2-4 pages).

My style
My teaching is characterized by my experience from research and industry. My own research, which is still ongoing, has given me access to scientific secured methods and a critical attitude. Moreover, my research has strengthened the knowledge in my area since I'm well acquainted with current related research. My role in industry has given my insight from the academia that can be applied on real problems which needs to be solved in industry. I try to communicate my knowledge from my research to the students. Commonly, I'm associating to current PhD projects, talking about problems that the research society are striving to solve, etc. These things usually arouse students' curiosity about the subject.

Problem-based learning
Having mentioned my style above, my teaching is characterized by giving the student the ability to be able to apply knowledge to practical problems.

"Problem-based learning reflects the way people learn in real life; they simply get on with solving the problems life puts before them with whatever resources are to hand"
(Biggs & Tang 2011)

By demonstrating the underlying problem, so does the incentive to find solutions and increase student motivation for learning. Since one of the learning in the Vehicle Dynamics course is to apply knowledge on practical problems, it is consequently important to stimulate problem-based learning during my meetings with the students.

A good starting point is to discuss the basis of an underlying problem. Problem-based learning encourages students to get involved, resulting in a higher interaction between the students and me. Usually, I hold a

discussion with the students where I bring in aspects and knowledge from other disciplines.

During exercises, it is also good that students are given either too much information or too little information that is necessary to solve the problem. For a typical real problem in the industry there is a wealth of information that is redundant. However some parts of the information may be difficult to access. Hence, the student must be able to understand which information that is really relevant, or alternatively, make assumptions about information that is not accessible in the task description. I encourage students to understand what information is needed and help them to be able to do assumptions that are good enough.

It has been shown that students who use problem-based learning fail their exam more frequently (Biggs & Tang 2011). Therefor I believe it is important to also adapt the examination to problem-based learning, which probably not is very common among problem-based teachers. As an example, I propose to examine the students' ability to handle over-determined information. I have made observations that the students' engagement, and thereby the effectiveness of their leaning, is increasing during problem-based learning sessions.

Heterogeneity

A challenge I face in my role as a teacher is that there are two different categories of students. One category is car enthusiast students who may have a solid experience in cars. Typically, these like to repair cars and handle mechanical tools. Often they have cars as their own private hobby. The second category is students who view the course as a theoretical challenge, but without having any practical experience of cars. This is a problem because it is difficult to teach the subject to a crowd with too diverse backgrounds.

The Vehicle Dynamics course requires good knowledge of mathematics, which is considered to be difficult. It helps also if you have car experience. Without the latter, it may be difficult to relate and understand the object car that is central. As a teacher, it becomes difficult to judge whether focus should be put on mathematics or practice. In these situations teachers tend to add the level too high (Hedin 2006).

Heterogeneity of prior knowledge is a real challenge and I deal with it by starting with a short rehearsal to cover abilities that do not exist in the class. To deal with this problem I plan to introduce an activity with mixed groups starting in the beginning of the course. Each group will solve a problem that involves both practical and mathematical solution capability. The idea of this group work is to equalize differences in prior knowledge and the practically oriented students can instruct the non-practice oriented ones. The results will be reported in writing and verbally in groups.

In order to get a better view of the heterogeneity, I will also hand out a test in the beginning of the course to gain an understanding of the variance of prior knowledge of the class. Simultaneously with this test, I will ask questions about what the expectations students have for the course, so-called "Introductory questionnaire" see (Mazur 1997), where I can get feedback what form of teaching that the students expect.

Equalization of math skills will not be fully accessed by the above mentioned group work. It is also difficult to tone down those elements of teaching as the course objectives include parts that require math skills. Therefore, I plan to early in the course hand out repetition document that summarizes the most important mathematical skills required, i.e. a sort of formulas with typical solutions. The idea here is that those with the worst skills in math should be able to raise their level.

Provide students with tools

My experience is that teachers commonly solve tasks during lectures and tutorials with little reflection about the choice of methods available. My own depth interviews with students in the course Vehicle Dynamics confirm this picture, where the students tell us that they spend a majority of their time writing of the teacher's solutions on the whiteboard, although these are available in written form from start. Students complain "teachers do not tell how to solve a problem, but just start writing." This way of teaching stimulates superficial learning that minimizes effort and worries but with constraints to manage the task. Memorization often used instead of understanding. What we want to achieve is deep learning where the student finds the task meaningful.

I think it is important for students to understand which methods are available to solve a given problem. This is important because the students should bring a "toolbox" of applied methods that they can use to real problems in their working lives. Tools mean here processes that are needed to reach a solution. Usually I initially present alternative methods available to solve a given problem. I also hold a discussion with students

about the limitations of each method. Finally I motivate the choice of the method that I demonstrate. The focus must be to understand each step that should be performed in the calculation, rather than getting all the details.

Often the teacher summarizes what had just been taught in conjunction with the completion of the lesson. Knowledge, however, is better remembered over time when students themselves actively give their reviews on the content of the lesson (Biggs & Tang 2011). Therefore, my goal is that before learning activities is closing a student should voluntarily summarize the content of the lesson. At best, it will be a fruitful discussion and a good feedback for me as a teacher. To encourage students to sign up for this, I will offer some type of reward.

Peer teaching
One challenge in my teaching situation is that students often are quiet and few dare to ask questions that risk being perceived as "stupid questions." This implies that there are few discussions and I receive poor feedback on what the students have understood. However, there is a need to highlight issues from their own perspective.

"There may be no single best method of teaching, but the second best is student teaching other students" (McKeachie et al. 1986).

The citation concerns so called peer teaching where students teach. At these occasions, students tend to open up and ask "dumb" questions. They can here get help from each other to interpret what I actually had said. One idea that dealt e.g. in (Biggs & Tang 2011) is to have group discussions led by a student tutor.

I recommend about 15 minutes presentations for each group where each presentation is evaluated by me at forehand. Finally, I sum up and fill in where it is needed. This is time consuming, so I prioritize execution of this method only when I suspect there are many students who do not understand. To my help I have now also "Introductory questionnaire" described above. Peer teaching also brings a variety of teaching, which benefits students' different learning styles.

I also have very good experiences of student correction. When a student revises another student's assignment /lab etc. there occurs an excellent learning opportunity since the students can reflect on others results. Often the students invest large efforts because they are reluctant to show themselves incompetent in front of their peers. Another advantage is that the correction burden for me as a teacher is facilitated.

Finally in this educational reflection, I want to highlight the importance of a good education climate. The teacher's role is to me teamwork with other teaching colleagues in the planning, execution and evaluation phases. It is important to have transparency and constantly support each other to improve the teaching.

References

(Biggs & Tang 2011)	Biggs, J. and Tang C. (2011), Teaching for Quality Learning at University, McGraw-Hill and Open University Press, Maidenhead, UK.
(Elmgren 2011)	Elmgren, M. and Henriksson, A. (2011), Universitetspedagogik, Norstedts, Sweden.
(Hedin 2006)	Hedin, A. (2006), Lärande på hög nivå, Uppsala Universitet, Sweden.
(Mazur 1997)	Mazur, E. (1997), Peer Instruction: A User's Manual, Prentice Hall. ISBN 0-13-565441-6.
(McKeachie et al. 1986)	McKeachie, W. J., Pintrich, P., Lin, Y., and Smith, D. (1986), Teaching and learning in the college classroom: A review of the research literature. University of Michigan, US.

4.5. Teaching skills. Here you should describe skills you have attained as a teacher on all levels. Relate to the areas you have mentioned below points 4.3 and 4.4. Write sub-headings corresponding to those in point 4.2. Verify your work with course analyses and other documents.

- **Teaching.**
  See the attached course evaluation "Kursutvärdering av teknikprojektet "Utvärdering av kurvtagningsförmåga för en radiostyrd bil"" valid for SD2001 2015 (Appendix 3) regarding Mats contribution as a lecturer.
- **Teaching aid production and development.**
  See the attached course evaluation "Kursanalys -KTH" (Appendix 4) regarding Mats contribution to the Laboratory exercise 3 valid for SD2231 2014. The exercise is new and based on feedback from students, we will improve the Lab by e.g. give a deeper introduction to Simulink and encourage students motivation by a competition.
- **Supervision.**
  I contemplate supervision as a way of establish cooperation between myself, the students and all

	other supervisors. The process of discussing problems and seeing the progress of the student is very stimulating. One of the most important keys turns out to be the maturity of being an independent researcher. During my development as a supervisor to PhD students, I have understood the importance of early writing. I encourage writing the first paper during the first year of studies. I also, nowadays, want the student to regularly write a summary of related references where I let him/her explain differences from own findings. Moreover I'm helping the student to establish a viable network of people. I expect sometimes students to go into a side track outside what has been decided in the plan. This side track may be very interesting, but does not give any answer to the dictated research question. Here, I think I must release the power of the student and his/her creativeness. Good results could be achieved when allowing the student to follow a dead end (Maybe not for sure a dead end, results can be publishable). A happy student is a good prerequisite for good result. As a supervisor I must be alert to anomalies and to secure that the student function well in a group of other PhD students and supervisors. The student is also expected to take initiative him/herself and work independently between meetings. After a while the student must feel that he/she "owns" the project. References for Mats role as co-supervisor for PhD students (See also certificate in Appendix 6): PhD student Derong Yang, contact Prof. Bengt Jacobson, Chalmers PhD student Johannes Edren, contact Prof. Annika Stensson Trigell, KTH PhD student Daniel Wanner, contact Prof. Annika Stensson Trigell, KTH PhD student Anton Albinsson, contact Prof. Bengt Jacobson, Chalmers • **Teaching activity outside the university and higher education institution.** See course evaluation of "Active Safety & Chassis School (ENG00008) 13w48" (Appendix 5) regarding Mats contribution as a lecturer in the Vehicle control part at Volvo Cars.
4.6.	Further development of teaching. Describe your development as a teacher and how you want to continue developing your teaching. The meaning of a good supervisor is difficult to grasp. Nevertheless, I believe it is important to bring more knowledge in my way of supervise and what the student expects from me. I would like to improve my communication with main supervisor to avoid conflicting advice and secure project to go in a unitary direction. I would also like to utilize the competence of student in a better way. This means that I must be willing to take risks to leave my safe area that I know and control. In my role as a teacher at Volvo Cars, I am a member in our internal teacher network. I regularly train my communication skills by attending lectures, seminars and courses in communication. I believe it is important to further develop the communication ability between myself and students. As one example, my focus just now is to act and reflect more on how to figure out students expectations before a lecture starts. By improving the understanding of expectations, lecture will proceed more efficiently and students will be satisfied.
5. Other assignments	
5.1.	Administrative assignments. • Experience of unit supervision specifying the duration and unit's size. Unit refers to research group, department and school etc. • Membership in boards/councils within universities over the past five years. • Other professional administrative assignments. Not applicable
5.2.	Research policy assignments. • Member of state research councils or committees within them. • Member of other boards or committees providing grants. • Assessment of Swedish and foreign research applications (number/year over the past five years). • Member of international research councils, programmes, committees or advisory groups.

- Other important expert and leadership assignments.

Not applicable

5.3. External contacts and external activities.

- Collaboration with trade and industry as well as authorities.
- Member of boards within companies and authorities.
- Other work within the third assignment.

Since I am employed by industry and works 20% of my time as affiliated researcher at KTH I have a natural and daily contact between industry/university. Also, through my engagement in SHC - Swedish Hybrid Vehicle Centre I have also contact to other universities in Sweden (Chalmers, LiU, LTH and Uppsala University) as well as the other vehicle manufacturers (Scania CV AB, AB Volvo and previously Saab Automobile and BAE Systems Hägglunds). Also, I have contact to the Energy Agency, since they funded my PhD research and at that time engaged me in several conferences and seminars.

6. Attached publications

6.1. List maximum ten publications which you would like to cite in the first instance. Write a list and brief explanation for the choice. Attach publications to your application.

1. M. Jonasson, S. Zetterström and A. S. Trigell, 'Autonomous corner modules as an enabler for new vehicle chassis solutions', FISITA Transactions 2006, paper F2006V054T, 2006.

2. M. Jonasson and O. Wallmark, 'Control of electric vehicles with autonomous corner modules: implementation aspects and fault handling', International Journal of Vehicle Systems Modelling and Testing, Vol. 3, No. 3, pp. 213–228, 2008.

3. M. Jonasson and J. Andreasson, 'Exploiting autonomous corner modules to resolve force constraints in the tyre contact patch', International Journal of Vehicle System Dynamics, Vol. 46, No. 7, pp. 553–573, 2008.

4. M. Jonasson and F. Roos, 'Design and evaluation of an active electromechanical wheel suspension system', Journal of Mechatronics, Vol. 18, Issue 4, pp. 218–230, 2008.

5. M. Jonasson, J. Andreasson, A. S. Trigell and B. Jacobson, 'Utilisation of actuators to improve vehicle stability at the limit: from hydraulic brakes towards electric propulsion', Journal of Dynamic Systems, Measurement and Control, Vol. 133, Issue 5, 27 July 2011.

6. M. Jonasson, J. Andreasson, B. Jacobson and A. S. Trigell, 'Global force potential of over-actuated electric vehicles', International Journal of Vehicle System Dynamics, Vol. 48, No. 9, pp. 983–998, 2010.

7. D. Yang, T. J. Gordon, B. Jacobson, M. Jonasson and M Lidberg, 'Optimized brake-based control of path lateral deviation for mitigation of secondary collisions', Proceedings of the Institution of Mechanical Engineers, Part D, Journal of Automobile Engineering, Vol. 225, Issue 12, December 2011.

8. D. Yang, T. J. Gordon, B. Jacobson and M. Jonasson, 'A nonlinear post-impact path controller based on optimized brake sequences', International Journal of Vehicle System Dynamics: International Journal of Vehicle Mechanics and Mobility, Vol. 50, Sup. 1, pp. 131-149, 2012.

9. D. Yang, T. Gordon, B. Jacobson and M. Jonasson. 'An optimal path controller minimizing longitudinal and lateral deviations after light collisions', Transactions on Intelligent Transportation Systems, Vol.13, No. 4, 2012.

10. J. Edrén, M. Jonasson, J. Jerrelind, A. S. Trigell and L. Drugge, 'Utilization of optimization solutions to control active suspension for decreased braking distance', International Journal of Vehicle System Dynamics, 2014.

I would like to append paper 1 and 4 since those papers give a brief description of the ACMs, which has been one of my focus areas. Papers 2, 3, 5, 6, 10 explains vehicle dynamics potential benefits of over-actuated systems. The papers 7-9 summarizes my contribution in the field of post impact stability control.

Beträffande affilierad forskare i fordonsdynamik vid
Institutionen för Farkost & Flyg, KTH

Volvo Cars välkomnar och stöder initiativet från KTH Fordonsdynamik att låta vår medarbetare Mats Jonasson fortsätta sin roll som inom fordonsdynamik som affilierad forskare med särskild inriktning mot innovativa fordonskoncept vid KTH Fordonsdynamik, Institutionen för Farkost & Flyg, Skolan för Teknikvetenskap vid KTH under tiden 2017-03-01 till 2020-03-01.

Volvo Cars förutsätter att adjungeringen kommer att vara inom teknikområden som är relevanta för Volvo Cars. Därför föreslås att Mats Jonasson fortsätter vara 100 % anställd av Volvo Cars, men ägnar 20 % av den tiden på KTH. Målsättningen är att verka för en adjungerad professur inom området.

Volvo Cars förväntar sig att KTH betalar Volvo Cars för lönekostnader för den del av arbetstiden (20 %) som Mats Jonasson ägnar åt affilieringen. Beloppet baseras på 20% arbetstid, årsarbetstid 1800 timmar och schablon lönekostnad 490 SEK/h, vilket ger 0.2*1800*490=176400 SEK/år. Volvo Cars avser att skicka faktura i efterskott i slutet av varje kalenderår.

KTH har dessutom förbundit sig att finansiera resor, logi, arbetsplats på KTH samt relaterade kostnader.

Volvo Cars har samarbetat med KTH Fordonsdynamik inom olika doktorandprojekt och undervisning under de senaste 20 åren. Det är Volvo Cars intention att fortsätta det samarbetet.

Med vänliga hälsningar

Göteborg 2017-03-01

Tomas Andersson
Senior Director, Active Safety (dept. 94400), Volvo Cars

Motivering för en utlysning av en tidsbegränsad adjunktstjänst i matematik

Matematikämnet utgör grunden för en stor del av naturvetenskapen och för de flesta ingenjörsämnen. Vid avdelningen för matematik utvecklar fakulteten ämnet vidare och utvecklar och ger kurser på grund-, avancerad och forskarnivå.

Från sommaren 2017 så kommer det att finnas 11,5 professorer, 14,5 lektorer, 1,5 biträdande lektorer och 1 adjunkt vid avdelningen. Utöver detta finns det en forskare.

Sedan 2014 har 5 professorer, 4 lektorer och 3 adjunkter lämnat avdelningen. Under 2017 lämnar en deltidsprofessor och en deltidsadjunkt avdelningen. Vidare så kommer (mycket oväntat) en professor som undervisade 70% att gå i pension i april 2017. Sedan 2014 har 3 lektorer, 1,5 biträdande lektorer och 1 adjunkt anställts. Med andra ord har de personer som har lämnat avdelningen inte ersatts genom nyrekryteringar. Detta är till del avsiktligt, eftersom pensioneringarna kom klumpvis (2014 gick sex personer i pension), och eftersom inga pensioneringar är planerade i perioden 2019-2022. Istället för att nyrekrytera i samband med pensionsavgångar är strategin att jämna ut nyrekryteringen över en längre period. Till del är underskottet på personal emellertid inte avsiktligt: en professor flyttade till Nederländerna, en lektor dog under den angivna tidsperioden och en går i förtida pension i april 2017. Bland annat på grund av det oväntade dödsfallet under sommaren 2016 och den oväntade förtidspensioneringen så har avdelningen ett stort oplanerat underskott på undervisningssidan (den bortgångne var en heltidsundervisande lektor).

Planen är att rekrytera två nya lektorer under det närmaste året. Bland annat på grund av den oväntade förtida pensioneringen så kommer detta emellertid inte att räcka, speciellt inte under läsåret 17/18. Behovet av extra personal har också ökat på grund av att timanställda pensionärer skall fasas ut ur undervisningen. Av den anledningen så finns det behov av en ALVA anställning för en adjunkt under perioden 2017-08-01 till 2018-01-31 (sex månader). Att den angivna tidsperioden är den mest naturliga har framkommit i diskussioner med studierektor vid avdelningen för matematik: en person som anländer i början av augusti har möjlighet att förbereda sig inför undervisningen som sätter igång i slutet av augusti. Vidare kan hon/han delta i rättningen och registreringen för tentamina som äger rum i januari.
Tidsperiod: 2017-08-01 till 2018-01-31 (sex månader).

Kostnadsredovisning:
På grundval av de inkomster avdelningen hade 2015 kunde 21 heltidsundervisande fakultetsmedlemmar och 12 heltidsforskande fakultetsmedlemmar finansieras av GRU och FoFu anslagen. Detta skall jämföras med de 28,5 fakultets- och adjunktsanställningar som förväntas vara kvar vid avdelningen sommaren 2017.

Jämställdhetsperspektiv
Avdelningen för matematik är traditionellt mansdominerad. Det gäller även ämnet internationellt, men särskilt i Sverige. För närvarande finns det en kvinnlig professor, två kvinnliga lektorer och en kvinnlig biträdande lektor på avdelningen. Vi har dock varit framgångsrika vid de senaste rekryteringarna och anställt två kvinnor (en lektor och en biträdande lektor) sedan 2012.

Utlysning:
Tjänsten kommer att utlysas via Nordic-Math-Job.

Potentiella sökande:
Senast KTH utlyste en adjunktstjänst så kom det in ett stort antal ansökningar. Vi förväntar oss även denna gång ett stort antal ansökningar.

Anställningsprofil för adjunkt i matematik

Ämnesområde
Matematik

Ämnesbeskrivning
Matematik

Arbetsuppgifter
I arbetsuppgifterna ingår att undervisa i kurser på grundnivå i matematik för civilingenjörsstudenter, vilket framförallt omfattar att vara examinator samt att hålla föreläsningar.

Behörighet
Behörig att anställas som adjunkt är den som har

- avlagt examen från grundläggande högskoleutbildning inom ämnet för anställningen eller har motsvarande kompetens,
- yrkesskicklighet som är av betydelse med hänsyn till anställningens ämnesinnehåll och de arbetsuppgifter som ska ingå i anställningen, samt
- visat pedagogisk skicklighet.

Bedömningsgrunder

Den ämnesmässiga skickligheten och yrkesskickligheten ska vara väl dokumenterad och relevant för anställningens innehåll.

Av högsta betydelse är att den sökande har

- goda kunskaper och undervisningsvana i matematik,
- dokumenterad pedagogisk skicklighet och förmåga till utveckling som lärare även på lång sikt,
- avlagt doktorsexamen inom matematik,
- förmåga att undervisa på svenska,

Det är även av betydelse att den sökande har

- förmåga att arbeta väl i lärarlag,
- förmåga att samverka med det omgivande samhället och informera om forskning och utvecklingsarbete,
- förmåga att utveckla och leda verksamhet och personal, däri ingår att ha kunskap om mångfalds- och likabehandlingsfrågor med särskild fokus på jämställdhet.