

# CURRICULUM VITAE

## FREDRIK BRUZELIUS

---

### ADDRESS

Mail work: Regnbågsgatan 1  
SE- 417 55 Göteborg  
Mail home: Eklanda Bäck 127  
SE-431 49 Mölndal  
Phone: +46-(0)31-750 2605, +46-(0)766-23 71 82  
Email: [fredrik.bruzelius@vti.se](mailto:fredrik.bruzelius@vti.se)  
Homepage: [www.vti.se/bruzelius](http://www.vti.se/bruzelius)

---

### PERSONAL DETAILS

Gender: Male  
Date of birth: 20<sup>th</sup> of May, 1974  
Marital status: Married  
Place of birth: Kristinehamn, Sweden  
Present Citizenship: Swedish

---

### DEGREES

- 1993-1995 Electrical Engineering degree, University of Karlstad
- 1995-1999 Master of Science in Applied Mathematics, Linköping University  
Thesis: *A discrete subdivision scheme for constructing a convex surface, using the Monge-Ampère operator*, Supervisor: Prof. Tommy Elfving
- 1999-2002 Licentiate of Engineering in Control Theory, Chalmers University of Technology  
Thesis: *LPV-Based Gain Scheduling – An  $\mathcal{H}_\infty$  approach* Supervisor: Prof. Claes Breitholtz
- 1999-2004 Doctor of Philosophy in Control Theory, Chalmers University of Technology  
Thesis: *Linear Parameter Varying Systems: An approach to Gain Scheduling*; Supervisor: Prof. Claes Breitholtz
- 2014 Docent in Vehicle Dynamics – Simulation & Estimation, Applied Mechanics, Chalmers University of Technology
- 

### TEACHING EXPERIENCE

- 1999 -2004 *Automatic Control for engineering physics students*, teaching assistant incl. classroom teaching, laboratory supervision, designing hand-in assignments, marking exams
- 1999-2004 *Adaptive and Optimal Control*, teaching assistant incl. classroom teaching, laboratory supervision, designing hand-in assignments, marking exams
- 2004 *Automatic control for vehicles*, lecturer of part of the course, co-author of compendium material.

- 2011 *Measurement techniques for automotive applications*, assistant lecturer supervisor.
- 2013,2015,2018 *Tire and Vehicle dynamics* PhD student course. Main course responsible, designing course contents, major lecturer, examiner.
- 

## SUPERVISION EXPERIENCE

### MASTERS STUDENTS

#### GRADUATED

- 2003 Sara Åberg, *Linjär Parameter-variernade reglering av en Furutapendel* MSc thesis Signals and Systems 2003:36, Chalmers. Supervisor.
- 2011 Han Shi, *Automatic generation of OpenDrive roads from road measurements*, MSc thesis Computer Science 2011:41, Chalmers. Supervisor
- 2012 Arun Kumar Subbana, *Closed loop race driver modelling*, MSc thesis Applied Mechanics 2012:29, Chalmers. Supervisor, Examiner
- 2012 Jorge Gómez Fernández, *A Vehicle Dynamics model in Modelica language to be used in Driving Simulator*, MSc thesis Applied Mechanics 2012:26, Chalmers. Supervisor, Examiner.
- 2013 Emanuele Obialero, *A Refined Vehicle Dynamics Model for Driving Simulators*, MSc thesis Applied Mechanics 2013:10, Chalmers. Supervisor. Examiner
- 2013 Yulong Gao, *Longitudinal Velocity and Road Slope Estimation in Hybrid/Electric Vehicles*, MSc thesis Applied Mechanics 2013:52, Chalmers. Examiner.
- 2014 Patrik Hansson, Anders Stenbeck, *Prepositioning of a Driving Simulator Motion System*, MSc thesis Applied Mechanics 2014:20, Chalmers. Examiner.
- 2016 Stefano Sedran, *A truck dynamics model for driving simulators*, MSc thesis Applied Mechanics 2016:07, Chalmers, Supervisor
- 2016 Erik Watcher, *Vehicle dynamics control on the limit*, MSc thesis Applied Mechanics 2016:XX, Chalmers, Examiner
- 2018 Johan Lindqvist, *Desktop Simulator for System Simulation*, MSc thesis Applied Mechanics 2018:XX, Examiner
- 2018 Nikhil Baliga & Gokul Gouda Hiregoudar, *Modeling of Tire to snow interaction*, MSc thesis Applied Mechanics 2018:XX, Supervisor.
- 2019 Akshay Bharadwaj, *STEERING EFFECTS OF ACTIVE SUSPENSIONS – Modelling and Control of ARB system to mitigate yaw disturbances and decrease driver steering effort*, MSc thesis Applied Mechanics 2019:XX, Supervisor.
- 2019 Lydia Schenk, *Musculoskeletal Driver Model for the Steering Feedback Controller* Master's thesis 2020:59, Chalmers. Joint work with TU Delft and As. Prof. Barys Shyrokau, Examiner.
- 2020 Erik Nordström *Advanced Modelling and Energy Efficiency Prediction for Road Vehicles*. Master's Thesis in Engineering Physics, 30 ECTS, Umeå University. Supervisor.
- 2020 Eva Skvor *Health Aware Optimisation of the Energy Management of a Fuel Cell - Battery Hybrid Electric Vehicle*. MSc thesis Applied Mechanics 2019:XX, Supervisor and Examiner.

## ONGOING

- 2020 Chirag Rajopadhye;Bharath Govardhan Raju, *Dynamic effects of rolling resistance*
- 2020 Jonas Johnsson ; Nicholas Nobeling *Belt tensioner for creating acceleration sensation in driving simulators*

## PHD STUDENTS

### GRADUATED LICENTIATE

- 2015 Anton Albinsson, *Online State Estimation in Electrified Vehicles Linked to Vehicle Dynamics*, Chalmers University of Technology, Thesis for Licentiate of Engineering no 2015:18, ISSN 1652-8565, main supervisor.
- 2016 Björn Blissing, *Driving in Virtual Reality – Investigations in Effects of Latency and Level of Virtuality*, Licentiate thesis, Linköping University, ISSN 978-91-7685-673-4, co-supervisor.
- 2016 Artem Kusachov, *Motion Perception and Tire Models for Winter Conditions in Driving Simulators*, Chalmers University of Technology, Thesis for Licentiate of Engineering no 2016:22, ISSN 1652-8565, main supervisor.
- 2019 Tushar Chugh , *Haptic Feedback Control Methods for Steering Systems* Chalmers University of Technology, Thesis for the degree of Licentiate – Department of Mechanics and Maritime Sciences: 2019:05, main supervisor.
- 2021 Luigi Romano, *Mathematical modelling of operating cycles for road vehicles* Chalmers University of Technology, Thesis for the degree of Licentiate – Department of Mechanics and Maritime Sciences: 2021:09, main supervisor.

### GRADUATED PHD

- 2018 Anton Albinsson, *Online and Offline Identification of Tyre Model Parameters* Chalmers University of Technology, Doktorsavhandlingar vid Chalmers tekniska högskola. Ny serie: 4401, ISBN 978-91-7597-720-1, main supervisor
- 2019 Pär Pettersson, *Operating cycle representations for road vehicles*. Doktorsavhandlingar vid Chalmers tekniska högskola. Ny serie: 4677, ISSN 0346-718X, co-supervisor.
- 2020 Björn Blissing, *Driving in Virtual Reality - Requirements for automotive research and development*, PhD thesis, Linköping University Electronic Press, co-supervisor.

## ONGOING

- 2017– Tech Lic. Tushar Chugh, Vehicle Dynamics, Chalmers University of Technology, main supervisor
- 2019 – Tech Lic Luigi Romano, Vehicle Dynamics, Chalmers University of Technology, main supervisor
- 2020 – Tech Lic. Weitao Chen, Vehicle Dynamics, Chalmers University of Technology, co-supervisor

## COURSES

- 2013 Supervision of Research, Division of Engineering Education Research, Chalmers University of Technology, 3 ECTS, Reference Professor Sven Andersson

## GRADING COMMITTEES/OPPOSITIONS

2015	PhD defense Mitra Pourabdollah Chalmers, suppliant in grading committee
2016	PhD defense Isabelle Stockman <i>Safety for Children in Cars – Focus on Three Point Seatbelts in Emergency Events</i> , Chalmers, grading committee
20XX	PhD defense Mohammad Mehdi Davari, <i>Exploiting over-actuation to reduce tyre energy losses in vehicle manoeuvres</i> , KTH, grading committee
20XX	MSc thesis, Katrik Poovendran, Pretoria South Africa, external examiner
2019	PhD defense Liang Shao, <i>Tire-Road Friction Estimation based on Vehicle Lateral Dynamics</i> , TU Graz, Austria, opponent
2019	PhD defense Robert Hult, <i>Optimization-based coordination strategies for connected and autonomous vehicles</i> Mechatronics, Chalmers, suppliant in grading committee
2019	PhD defense Christian-Nils Boda <i>Driver interaction with vulnerable road users: Modelling driver behaviour in crossing scenarios</i> , Traffic Safety, Chalmers, grading committee

---

## MAJOR RESEARCH GRANTS

2011	Project:	Everyday Safety for Electric Vehicles (EVERSAFE)
	Budget:	1.9 M€ / VTI 3.5 MSEK
	Funder:	Era-Net electro-mobility
	Main appl.:	Fredrik Bruzelius (VTI)
	Co-appl.:	Volvo Cars, Royal Institute of Technology, Technische Universität Chemnitz, Fraunhofer-Gesellschaft, Bundesanstalt für Strassenwesen
2011	Project:	Next Generation Test Methods for Active Safety system
	Budget:	55 MSEK / VTI 5.5 MSEK
	Funder:	FFI - Fordons- & trafiksäkerhet
	Main appl.:	Christian Grante (Volvo GTT)
	Co-appl.:	Fredrik Bruzelius (VTI), Volvo Cars, Autoliv, Högskolan i Halmstad, Chalmers, SP
2012	Project:	Torque Sensing for Vehicle State Estimation (TorqSens)
	Budget:	8 MSEK / Chalmers 3.1 MSEK
	Funder:	FFI - Fordonsutveckling
	Main appl.:	Mats Jonasson (Volvo Cars, Project leader), Fredrik Bruzelius (Chalmers, main composer of application)
	Co-appl.:	BorgWarner TorqTransfer Systems
2014	Project:	Winter testing in driving simulator (WinterSim)
	Budget:	5.6 MSEK / VTI 4.4 MSEK
	Funder:	ViP competence center, Test Site Sweden
	Main appl.:	Fredrik Bruzelius (VTI)
	Co-appl.:	Volvo Cars, Volvo GTT
2016	Project:	Tyre Sensing for Tyre Model Parametrization TYRESENS
	Budget:	4.616 MSEK / VTI 0.7 MSEK
	Funder:	FFI - EMK
	Main appl.:	Fredrik Bruzelius (VTI)
	Co-appl.:	Volvo Cars, Chalmers University of Technology

2016	Project:	Utveckling och demonstration av avancerad cykel-simulator CYKELSIM
	Budget:	2 MSEK
	Funder:	FFI - Cyklar och andra fordon i säker och smart samverkan/Länsförsäkringar
	Main appl.:	Fredrik Bruzelius (VTI)
2017	Project:	Sustainable traffic of autonomous vehicles in smart-parking managementSMARTPARK
	Budget:	2.5 MSEK/ VTI 0.7 MSEK
	Funder:	FFI - EMK
	Main appl.:	Fredrik Bruzelius (VTI)
	Co-appl.:	Stockholm Stad, Stockholm Parkering, Swarco, Höskolan i Skövde
2018	Project:	Steer by wire Opportunities, performance and system safety SWOPPS
	Budget:	11.6 MSEK/ VTI 0.8 MSEK
	Funder:	FFI - EMK
	Main appl.:	Fredrik Bruzelius (VTI)
	Co-appl.:	Volvo Cars, Chalmers University of Technology, Royal Institute of Technology

## REVIEWER ASSIGNMENTS

2008–	The International Journal of Vehicle Systems Modelling and Testing (IJVSMT).
2008–	The International Journal of Vehicle System Dynamics (IJVSD)
2008–	Proceedings of the Institution of Mechanical Engineers, Part D, Journal of Automobile Engineering
2008–	Vehicle System Dynamics – International Journal of Vehicle Mechanics and Mobility

## INTERNATIONAL COLLABORATIONS

2002–2004	Professor Guisheng Zhai, Osaka Prefecture University, Japan.
2008–	PhD Ari Tuononen, Researcher, Alto University, Finland.
2009–	Mikko Liukkula, Development manager, Nokian Tyres, Finland
2012–	PhD Martin Fischer, Researcher, The German Aerospace Center (DLR)
2016–	Assistant Professor Baris Shyrokau TU Delft, The Netherlands

## PROJECTS

2004–2007	Assisted steering control algorithm development at Volvo Cars, project member, algorithm development
2004–2007	<i>Road Friction Estimation I</i> , IVSS Intelligent Vehicle Safety Systems program, project member
2007–2010	<i>Road Friction Estimation II</i> , IVSS Intelligent Vehicle Safety Systems, acting project coordinator

- 2008-2010 *eVALUE*, 7:th European Union Frame-program, project leader for VTI, project leader for work package on physical testing
- 2011-2013 *Driver response to lateral disturbances*, Chalmers fakultetsmedel, project member.
- 2012–2015 *NG Test methods*, FFI, project lead for VTI, supervisor of PhD student
- 2013–2017 *WinterSim*, ViP competence centre/TSS, project leader, supervisor of PhD student
- 2013–2017 *Torque Sensing for Vehicle State Estimation*, project lead for Chalmers, supervision of PhD student.
- 2017–2018 *Tyre Sensing for Tyre Model Parametrization*, project leader, supervision of PhD student.
- 2018– *Steer by wire Opportunities, performance and system safety*, project leader, supervision of PhD student.
- 2019– *COVER*, project lead for VTI, supervision of PhD student.

## EMPLOYMENTS

- 1997–1998 Teaching assistant in Numerical Analysis at Linköping University
- 1997–1998 Teaching assistant in Mathematical Statistics at Linköping University
- 1999–2004 PhD student position at the Department of Signals and Systems at Chalmers University of Technology
- 2004–2008 Researcher in Vehicle Dynamics and Control at Volvo Technology
- 2008– Research Associate in Vehicle Dynamics at the Swedish National Road and Transport Research Institute (VTI), Göteborg Sweden.
- 2011–2013 Researcher (Post Doc) at Vehicle Dynamics, Applied Mechanics, Chalmers University of Technology
- 2013 Project leader ( Co-supervisor) at Vehicle Dynamics, Applied Mechanics, Chalmers University of Technology
- 2014– Adjunct Professor in Vehicle Dynamics, Applied Mechanics, Chalmers University of Technology

## PUBLICATIONS

### VEHICLE DYNAMICS

#### JOURNALS

- [J24] Schenk, Lydia; Chugh, Tushar; **Bruzelius, Fredrik**; Shyrokau, Barys. 2021. *Musculoskeletal Driver Model for the Steering Feedback Controller* Vehicles 3, no. 1: 111-126. 2021. <https://doi.org/10.3390/vehicles3010007>
- [J23] Luigi Romano, **Fredrik Bruzelius**, Bengt J H Jacobson, *Brush tyre models for large camber angles and steering speeds* Vehicle System Dynamics. Vol. In Press, 2020.
- [J22] Luigi Romano, **Fredrik Bruzelius** and Bengt Jacobson, *Unsteady-State Brush Theory*. Vehicle system dynamics, DOI: 10.1080/00423114.2020.1774625, 2020.
- [J21] T. Chugh, **F. Bruzelius**, M. Klomp and B. Shyrokau, *An Approach to Develop Haptic Feedback Control Reference for Steering Systems Using Open-loop Driving Maneuvers* Vehicle System Dynamics, DOI: 10.1080/00423114.2019.1662923

- [J20] Pär Pettersson, Pär Johannesson, Bengt J H Jacobson, **Fredrik Bruzelius**, Lars Fast, Sixten Berglund *A statistical operating cycle description for prediction of road vehicles' energy consumption* Transportation Research Part D: Transport and Environment 1361-9209 (ISSN) Vol. 73 pp. 205-22, 2019.
- [J19] Albinsson, A.,**Bruzelius, F.**, Jacobson, B. and Ran, S. *Validation of vehicle based tyre testing methods*. Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering, Vol 233, Issue 1, 2019.
- [J18] **Bruzelius, F.**, Kharrazi, S. *Low Speed Performance Based Standards for Nordic Countries*. International Journal of Heavy Vehicle Systems, Vol. 28, No. 1, 2021.
- [J17] A. Albinsson, **F. Bruzelius**, B. Jacobson, Els, P.S., Bakker, E. *Tire Vibration Considerations in Vehicle Based Tire Testing*. Journal of Tire Science and Technology, Volume 47, Issue 3 2019.
- [J16] B. Blissing **F. Bruzelius**, Eriksson, O. *Driver behavior in mixed- and virtual reality – a comparative study* Transportation Research Part F: Traffic Psychology and Behaviour. <https://doi.org/10.1016/j.trf.2017.08.005>. 2017.
- [J15] Albinsson, A.,**Bruzelius, F.**, Jacobson, B. and Bakker, E. *Evaluation of vehicle based tyre testing methods*. Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering, Vol 233, Issue 1, 2019.
- [J14] A. Kusachov **F. Bruzelius**, M. Hjort *A double interaction brush model for snow conditions*, Journal of Tire Science and Technology, Vol. 47 Issue 2 p. 118-140 2019.
- [J13] M. Hjort, O. Ericsson, **F. Bruzelius**, *Comprehensive Study of the Performance of Winter Tires on Ice, Snow, and Asphalt Roads: The Influence of Tire Type and Wear*. Tire Science and Technology, TSTCA, Vol. 45, No. 3, 2017, pp. 175–199.
- [J12] Wachter, Erik & Alirezai, M. & **Bruzelius, Fredrik** & Schmeitz, A. *Path control in limit handling and drifting conditions using State Dependent Riccati Equation technique*. Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering. 095440701985073. 10.1177/0954407019850737.2019.
- [J11] Albinsson, A.,**Bruzelius, F.**, Jacobson, B. and Fredriksson, J. *Design of Tyre Force Excitation for Tyre-Road Friction Estimation*. Vehicle System Dynamics, Vol. 55, Issue 2,, 208–230. 2016.
- [J10] Blissing, B. **Bruzelius, F.** & Eriksson, O. *Effects of visual latency on vehicle driving behavior*. ACM Transaction on Applied Perception, Vol 14, No 1, 2016.
- [J9] Albinsson, A.,**Bruzelius, F.**, Pettersson, P., Jonasson, M. & Jacobson, B. *Estimation of the inertial parameters of vehicles with electric propulsion*, Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering. 2015.
- [J8] P. Hansson, A. Stenbeck, A. Kusachov, **F. Bruzelius**, B. Augusto *Prepositioning of driving simulator motion systems* International Journal of Vehicle Systems Modelling and Testing, Vol. 10, No 3, 2015.
- [J7] **F. Bruzelius** *A Theoretical Justification of the Sine With Dwell Maneuver* Vehicle System Dynamics. Vol. 5, Issue 4, p. 493–505, 2015.
- [J6] M. Klomp, G. Yunlong, **F. Bruzelius** *Longitudinal Velocity and Road Slope Estimation in Hybrid Electric Vehicles Employing Early Detection of Excessive Wheel Slip* Vehicle System Dynamics. Vol. 52 (2014) p. 172–188
- [J5] **F. Bruzelius**, J. Gomez Fernandez, B. Augusto *A Basic Vehicle Dynamics Model for Driving Simulators*. International Journal of Vehicle Systems Modelling and Testing, Vol. 8, No. 4, pp 364–385, 2013.
- [J4] **Bruzelius, Fredrik**; Hjort, Mattias; Svendenius Jacob *Validation of a basic combined slip tyre model for use in friction estimation applications* In Proc. IMechE, Part D: Journal of Automobile Engineering, 2014, Vol. 228(13), pp. 1622-1629.

- [J3] **F. Bruzelius**, D. Uystepuyst, B. Jacobson, S. Krajinović *A simple real-time aerodynamic model for vehicles in overtaking situations* International Journal of Vehicle Systems Modelling and Testing, Vol. 8, No. 3, pp 241–259, 2013.
- [J2] **Bruzelius, Fredrik**; Svendenius, Jacob; Yngve, Simon; Casselgren, Johan; Rönnerberg, Johan; Olsson Gunnar *Evaluation of Tire to Road Friction Estimators, Test Methods and Metrics*, In International Journal of Vehicle Systems Modelling and Testing, Vol 5. Nos 2/3 pp 213–236, 2010.
- [J1] Jacob Svendenius, Magnus Gäfvert, **Fredrik Bruzelius**, Johan Hultén *Experimental Validation of the Brush Tire Model*. Journal of Tire Science and Technology, vol. 37, pp 122–137, 2009.

#### CONFERENCE PROCEEDINGS

- [C31] Alireza Marzbanrad, **Fredrik Bruzelius**, Bengt J H Jacobson, Edo Drenth *Enhanced Sliding Mode Wheel Slip Controller for Heavy Goods Vehicles*, EuroBrake Vol. EB2020- IBC-012
- [C30] Pär Pettersson, Bengt J H Jacobson, **Fredrik Bruzelius**, Pär Johannesson & Lars Fast *Intrinsic differences between backward and forward vehicle simulation models* 21st IFAC World Congress Berlin, Germany, 2020
- [C29] Luigi Romano<sup>1</sup>, Fredrik Bruzelius and Bengt Jacobson, *A Brush Tyre Model with Standstill Handler for Energy Efficiency Studies*, 6th. Internationales Commercial Vehicle Technology Symposium, Kaiserslautern, Germany, 2020.
- [C28] Erik Wachter, Antoine Schmeitz, **Fredrik Bruzelius**, Mohsen Alirezaei *Path control in limits of vehicle handling: A sensitivity analysis* The 26th International Symposium on Dynamics of Vehicles on Road and Tracks (IAVSD19), Guthenburg, Sweden.
- [C27] Shenjin Zhu, Leon Henderson, Edo Drenth, **Fredrik Bruzelius**, Bengt Jacobson *An Investigation of Longitudinal Tyre Force Observation for Slip Control System Development* The 26th International Symposium on Dynamics of Vehicles on Road and Tracks (IAVSD19), Guthenburg, Sweden.
- [C26] T. Chugh, **F. Bruzelius**, M. Klomp, S. Ran, *Design of Haptic Feedback Control for Steer-by-Wire* The 21st IEEE International Conference on Intelligent Transportation Systems, Maui, Hawaii, US, 2018.
- [C25] B. Blissing, **F. Bruzelius**, *Exploring the suitability of virtual reality for driving simulation* Driving Simulation Conference & Exhibition (DSC18), Antibes, France 2018.
- [C24] T. Chugh, **F. Bruzelius**, M. Klomp, S. Ran, *Comparison of Steering Feel Control Strategies in Electric Power Assisted Steering* the 14th International Symposium on Advanced Vehicle Control, (AVEC'18), Beijing, China, 2018.
- [C23] A. Albinsson, **F. Bruzelius**, S. Ran *Scaling tire models to different road surfaces using an external IMU and K&C measurements* the 14th International Symposium on Advanced Vehicle Control, (AVEC'18), Beijing, China, 2018.
- [C22] A. Albinsson, **F. Bruzelius**, B. Jacobson, Els, P.S., Bakker, E. *Tire Vibration Considerations in Vehicle Based Tire Testing*. The 37th annual meeting of the Tire Society, Akron, USA, 2017.
- [C21] A. Albinsson, **F. Bruzelius**, M. Hjort, *Required Friction Utilization for Friction Estimation on Wet Asphalt, an Experimental Study*, The 25th International Symposium on Dynamics of Vehicles on Road and Tracks (IAVSD17), Rockhampton, Australia 2017.
- [C20] A. Albinsson, **F. Bruzelius**, B. Jacobson, *Friction Utilization for Tyre-Road Friction Estimation on Snow: An Experimental Study*, the 13th International Symposium on Advanced Vehicle Control, (AVEC'16), Munich, Germany, 2016.
- [C19] M. Hjort, O. Ericsson, **F. Bruzelius**, *A comprehensive study of the performance of winter tires on ice, snow and asphalt roads – the influence of tire type and wear*. The 35th annual meeting of the Tire Society, Akron, USA, 2016.



- [C18] **F. Bruzelius**, S. Kharrazi, E. Pettersson. *Model and Road Surface Sensitivity of Longitudinal Performance Based Standards*, The 14th International Symposium on Heavy Vehicle Transport Technology, Rotorua, New Zealand, 2016.
- [C17] S. Sedran, **F. Bruzelius**, S. Kharrazi, B. Jaobsson, N. Amati. *A Heavy Vehicle Dynamics Model For Driving Simulators*, The 14th International Symposium on Heavy Vehicle Transport Technology, Rotorua, New Zealand, 2016.
- [C16] B. Blissing **F. Bruzelius**, Eriksson, O. *Driver behavior in mixed- and virtual reality – a comparative study* Driving Simulation Conference & Exhibition (DSC16), Paris, France 2016.
- [C15] A. Kusachov **F. Bruzelius**, M. Hjort *Perception of Tire Characteristics in a Motion Base Driving Simulator* Driving Simulation Conference & Exhibition (DSC16), Paris, France 2016.
- [C14] B. Blissing **F. Bruzelius**, *A Technical Platform Using Augmented Reality For Active Safety Testing* Proceedings of the International Conference Road Safety and Simulation, USA 2015.
- [C13] A. Kusachov, **F. Bruzelius**, B. Augusto, M. Fischer *The Importance of Yaw Rotation Center for the Perception of motion* Driving Simulation Conference & Exhibition (DSC15), Tübingen, Germany 2015.
- [C12] A. Kusachov, **F. Bruzelius**, X. Xie, *The Importance of Yaw Motion Feedback in Driving Simulators* The 24th International Symposium on Dynamics of Vehicles on Road and Tracks (IAVSD15), Graz, Austria 2015.
- [C11] A. Albinsson **F. Bruzelius**, T. Gustavsson, M. Jonasson, B. Jacobson *Active excitation for identification of tyre-road characteristics*. The 24th International Symposium on Dynamics of Vehicles on Road and Tracks (IAVSD15), Graz, Austria 2015.
- [C10] A. Albinsson, **F. Bruzelius**, B. Jacobson, M. Jonasson, *Tire Force Estimation Based on the Recursive Least Square Method Utilizing Wheel Torque Measurement*, the 12th International Symposium on Advanced Vehicle Control, (AVEC'14), Tokyo 2014.
- [C9] **F. Bruzelius**, M. Karlsson, B. Augusto *Realism of overtaking situations in motion based driving simulators*. Proceedings of the International Conference Road Safety and Simulation, Italy 2013.
- [C8] B. Blissing **F. Bruzelius**, J. Ölvander *Augmented and Mixed Reality as a tool for evaluation of Vehicle Active Safety Systems* Proceedings of the International Conference Road Safety and Simulation, Italy 2013.
- [C7] M. Klomp, Y. Gao, **F. Bruzelius** *Robust Estimation of Longitudinal Velocity and Road Slope in Hybrid Electric Vehicles using an Adaptive Kalman Filter*. Proceedings of the 23st International Symposium on Dynamics of Vehicles on Roads and Tracks (IAVSD'13), China, 2013.
- [C6] M. Hjort, **F. Bruzelius**, H. Andersson, S. Kharrazi, *Towards A Method for Determining Maximum Oversteering in Slippery Conditions*. Proceedings of the 23st International Symposium on Dynamics of Vehicles on Roads and Tracks (IAVSD'13), China, 2013.
- [C5] **Fredrik Bruzelius**, Mattias Hjort, Håkan Andersson, *Towards an Indoor Winter Tire Classification Test* Proceedings of 3th Mini Conference on Vehicle System Dynamics, Identification And Anomalies, Budapest Hungary, November 2012.
- [C4] A. K. Subbanna, **F. Bruzelius**, E. Drenth, I. Torstensson, P. Sundstrom, *Velocity Planning for a Racing Driver Model* Proceedings of the 11th International Symposium on Advanced Vehicle Control (AVEC '12), Seoul Korea, 2012.
- [C3] Mattias Hjort, **Fredrik Bruzelius**, Håkan Andersson *The importance of tyre grip for the function of ESC systems on icy roads*, Proceedings of the 22st International Symposium on Dynamics of Vehicles on Roads and Tracks (IAVSD'11), Manchester, UK, August 14-19, 2011.

- [C2] Nicolas Dela, Leo Laine, **Fredrik Bruzelius**, Håkan Sehammar, Linda Renner, Gustav Markkula, Ann-Sofi Karlsson, *A pilot evaluation of using large movement driving simulator experiments to study driver behaviour influence on active safety systems for commercial heavy vehicles*, Proceedings of the 21st International Symposium on Dynamics of Vehicles on Roads and Tracks (IAVSD'09), Stockholm, Sweden, August 17-21, 2009.
- [C1] Jacob Svendenius, Magnus Gäfvert, **Fredrik Bruzelius**, Johan Hultén *Experimental Validation of the Brush Tire Model*. Meeting of the Tire Society, September 2007.

## CONTROL THEORY (BEFORE PHD DEGREE)

- [1] **Bruzelius, Fredrik**; *Linear Parameter-Varying Systems - an approach to gain scheduling*. PhD Thesis, Chalmers University of Technology. 2004.
- [2] **Bruzelius, Fredrik**; Pettersson, Stefan; Breitholtz, Claes *Linear parameter-varying descriptions of nonlinear systems*. American Control Conference, Boston, Massachusetts, pp. 1374-1379. 2004.
- [3] Guisheng Zhai Koyama, N. **Bruzelius, F.** Yoshida, M. *Strict LMI conditions for stability and stabilization of discrete-time descriptor systems*. IEEE International Symposium on Intelligent Control, 2004.
- [4] **Bruzelius, Fredrik**; Pettersson, Stefan; Breitholtz, Claes *Induced  $\mathcal{L}_2$ -gain domain for LPV-Gain scheduled control systems*. IEEE Mediterranean Conference on Control and Automation. 2003.
- [5] **Bruzelius, Fredrik**; Pettersson, Stefan; Breitholtz, Claes *Region of attraction estimates for LPV-Gain scheduled control systems*. European Control Conference. 2003.
- [6] **Bruzelius, Fredrik**; Pettersson, Stefan; Breitholtz, Claes *LPV-Based Gain Scheduling Technique applied to a Turbo Fan Engine Model*. IEEE International Conference on Control Applications, 2002
- [7] **Bruzelius, Fredrik** *On the computation of LPV controllers* Technical Report 1403-266X, Department of Signals and Systems. Chalmers University of Technology. 2001
- [8] **Bruzelius, Fredrik**; Breitholtz, Claes *Gain Scheduling using Linear Parameter-varying Systems and  $\mathcal{H}_\infty$  synthesis*. Proc of the 4th Swedish-Russian control conference. 2001
- [9] **Bruzelius, Fredrik**; Breitholtz, Claes *Gain scheduling via affine linear parameter-varying systems and  $\mathcal{H}_\infty$  synthesis*. 40th IEEE Conference on Decision and Control. 2001.

## THESES

- [1] Bruzelius, Fredrik *A discrete subdivision scheme for constructing a convex surface, using the Monge-Ampère operator*, LiTH-MAT-Ex-98-22. 1998. MSc thesis.
- [2] Bruzelius, Fredrik *LPV-Based Gain Scheduling – An  $\mathcal{H}_\infty$  approach*, Technical Report No 430L, Chalmers University of Technology, 2002. Tech. Lic. thesis.
- [3] Bruzelius, Fredrik *Linear Parameter-Varying Systems an approach to gain scheduling*, ISBN 91-7291-394-0, Technical Report No 472, School of Electrical Engineering, Chalmers University of Technology, 2004. PhD thesis.

---

## PATENTS

- [1] Svendenius J; Gäfvert M; Bruzelius F; Hultén J, *Systems and methods for determining a parameter relating to a tire-to-road contact and/or relation between a wheel and a vehicle motion* Patent number US20080041404 20080303.

- [2] Bruzelius F; Solyom S; Svendenius J; Hultén J, Gävert M, *Vehicle-to-road contact estimation*. Patent number EP2138372A1.
  - [3] Jonasson M; Gustavsson T; Albinsson A; Bruzelius F, *Method and arrangement for tire to road friction estimation*. Patent number 15172369.9-1756
  - [4] Jonasson, M. Albinsson A; Bruzelius F, *Method and a System for computing a road friction estimate*. Patent/application number 17169229.6-1762
  - [5] Chugh, T., Bruzelius F. and XXX *METHOD AND APPARATUS FOR OPERATING A HAPTIC SYSTEM*. Patent/application number XXX
- 

## REFERENCES

Available upon request

Göteborg, May 18, 2021