

## Matteo Corno

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PERSONAL DATA	Matteo Corno Delft University of Technology Delft Center for Systems and Control Mekelweg 2, 2628 CD Delft The Netherlands	m.corno@tudelft.nl Tel: (+31) (0)15 27 85242 Mobile: (+31) (0)6 23 911748 Fax: (+31) (0)15 27 86679
CURRENT POSITION	<i>Assistant Professor</i>	<b>Delft University of Technology Delft, the Netherlands Oct. 15th, 2009 – Present</b> Assistant Professor at the Delft Center for Systems and Control in the Faculty of Mechanical, Maritime and Materials Engineering, under the chair of Intelligent Automotive System held by prof. Edward Holweg.
PROFESSIONAL EXPERIENCE	<i>PostDoc Researcher</i>	<b>Politecnico di Milano Milan, Italy Feb. 1st, 2009 – Jul. 31st, 2009</b> Lead and carried out individual research on the project named “Design of control systems for two-wheeled vehicles”. In particular focus has been given to the traction control problem, and steering instabilities.
	<i>PostDoc Researcher</i>	<b>Johannes Kepler Universitat Linz, Austria Jan. 1st, 2009 – Jun. 31st, 2009</b> Studied control techniques for emission optimization for automotive Diesel Engines; research carried out in the Institut fur Design und Regelung Mechatronischer Systeme. Original appointment was scheduled to end in December 2009; resigned earlier to accept position at TU Delft.
	<i>Research Specialist</i>	<b>University of Minnesota Minneapolis, MN, USA Jul. 1st, 2007 – Nov. 15th, 2007</b> Studied control techniques for Linear Parameter Varying systems and their application to two wheeled vehicle traction control. Research carried out at the Department of Aerospace and Mechanical Engineering.

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*Intern*

Thales Alenia Space srl

Torino, Italy

Oct. 1st, 2006 – Apr. 30th, 2007

Feasibility study and preliminary development of the attitude control system of an orbiting particle detector.

*Consultant Analyst*

Ravizza &C srl.

Milan, Italy

Aug. 1st 2005 – Dec. 31st, 2007

Design and coding of an information system for a small company (20 employees). The system is composed of a database (SQL) and a web interface (PHP).

*Research Assistant*

University of Illinois

Chicago, IL, USA

Jan. 1st, 2004 – May 31st, 2005

Developed and formally analyzed haptic devices and controllers to be used in training tasks. Obtained “Investigator Education Certification” to work with human subjects.

### EDUCATION

January 2006 - March 2009

**PhD, Information Engineering.**

Politecnico di Milano, Milano, Italy.

Major Research Topic: “*Active Stability Control Systems Design for Road Vehicles*”

Advisor: Prof. Sergio M. Savaresi

Minor Research Topic: “*Spacecraft Attitude Estimation and Control*”

Advisor: Prof. Marco Lovera

Final grade: **Laude**

January 2004 - August 2005

**M.S., Electrical and Computer Engineering.**

University of Illinois, Chicago, IL, USA.

GPA: **3.87/4**

September 1999 - October 2005

**Laurea (Master’s Equivalent), Computer Engineering.**

Politecnico di Milano, Milano, Italy.

Dissertation title: “*Haptic Playback: a New Approach to Teaching of Sensorimotor Skills*”

Final grade: **100/100 cum Laude**

September 1994 – July 1999

**High School Diploma.**

Liceo Scientifico A. Banfi, Vimercate, MI, Italy

Final grade: **100/100**

POST-GRADUATE **Graduate Schools**  
 COURSE WORK

Course	Institution Lead Instructor
Fast Estimation and Identificaion Methods	Gipsa-lab, Grenoble Prof. M. Fliess
Piecewise-smooth Dynamical Systems	Society for Chaos and Complexity Prof. S. Rinaldi
LMI's in Control	HYCON-EECI, Supelec Prof. C. Scherer.
LPV/LFT Modeling and Identification	Politecnico di Milano Prof. K. Poolla

**PhD Courses**

Course	Instructor Grade
Object Oriented Modeling and Simulation	Prof. F. Casella Grade: A
Hybrid Systems	Prof. M. Prandini Grade: A
Nonlinear Control	Prof. M. Lovera Grade: A
Motion Control	Prof. P. Rocco and G. Ferretti Grade: A
Closed Loop Identification	Prof. I. D. Landau Grade: A
Variational Methods for Optimal Control	Prof. A. Locatelli Grade: A
Fault Detection in Mechatronic Systems	Prof. G. Rizzoni Grade: A
Microcontrollers	Prof. F. Zappa Grade: A

**Other Courses**

Course	Institution
Personal Research Grants	TU Delft
Aquisition power and Presentation Skills	TU Delft
How to Write a Competitive Proposal for Framework 7 (FP7)	Hyperion Ltd

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## RESEARCH STATEMENT

My research interests mainly encompass vehicle systems. Vehicle systems offer a challenging platform for research problems, especially as emerging countries citizens gain access to personal transportation systems. If one considers that China car market is growing roughly 20 percent a year, it is clear that the need for sustainable transportation means is going to increase. Moreover, the ability of providing inherently safe vehicles would help saving lives and reducing health care costs, in Western countries as well as emerging ones. Not only automotive systems represent an economic potential, but they are rich in open research problems for the control community. During my graduate studies, I principally focused on active chassis stabilization of both two and four wheeled vehicles. Most of these projects were carried out in collaboration with industrial partners. This experience provided me with the needed expertise to manage industry - academia joint research projects. I believe that engineering academic research must be carried out along two parallels and interbreeding tracks. On one side, it is important for a researcher to stay in contact with the industry, which is a source of interesting and relevant problems; on the other side, he or she must be capable of initialize, manage and formalize more long-sighted research projects. I believe that interbreeding between the two tracks is the real added value that doing research in an academic environment can provide.

## RESEARCH BACKGROUND

My research experience began while I was attending the Master of Science program at the University of Illinois. There, I worked with Professor Milos Zefran on haptic playback and its potentiality in the teaching of sensorimotor skills. Haptic playback refers to the possibility of simultaneously displaying pre-recorded position and force information to one or more users through haptic (or force feedback) interfaces. During the three years of my Ph.D., I changed research topic to focus on automotive systems. My Ph.D. Dissertation is aimed at providing a methodologically and experimentally sound treatment of the stability issues affecting two and four-wheeled vehicles. Along the path toward an integrated stability control system, I researched different problems ranging from the active control of braking via LPV modeling, to traction control, and semi-active control of steering damper. In tackling these problems I have adopted a research method that is methodologically sound and, at the same time, aimed at experimental validation. As an elective minor research topic, I faced the problems of nonlinear estimation of satellite attitude via unscented Kalman filtering, multi-body modeling of satellite and fuel-constrained reference attitude generation.

## CURRENT RESEARCH

I am currently working on three main research directions.

- **Two-wheeled vehicles active stability control.** In the field of two-wheeled vehicles, I am following the themes of control-oriented nonlinear modeling of motorbike engine-to-slip dynamics and of out-of-plane dynamics. These efforts are aimed at devising an integrated active stability control for motorbikes. I believe this effort to be very important, as two-wheeled vehicles can be seen as a solution to the urban congestion and pollution problems, and increasing the safety of this kind of vehicles would foster their diffusion.

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- **Load-based vehicle dynamics control.** In collaboration with SKF (the world's leading bearing manufacturer), I am investigating the potentialities of the load-based vehicle dynamics approach. Currently, most vehicle dynamic control systems are motion based, meaning that the control action is decided using motion measurements (acceleration, velocities, angular rates). This is an indirect approach, as the final objective is that of controlling the force generated by the tire. SKF has recently developed load sensing bearing, the availability of this direct measurement allows to adopt a more direct approach that can yield better performance. Up to now, I have proved the feasibility of this approach in the longitudinal dynamics domain (ABS). The future steps will focus on lateral and vertical domains.
- **Methodologies for Battery Management and Control.** In collaboration with two Dutch companies, I have been active in the field of estimation techniques for battery systems. In particular, one of the most daunting challenges is that of determining the state of health of the battery. I have been approaching the problem from two perspectives: a data driven approach based on LPV techniques and a model based approach based on a physical modeling of the cell. The electrochemical cell is governed by processes that can be described as ODE equations; I am developing estimation techniques for that kind of systems. In particular a Semi-Separable Structure approach is being pursued; by exploiting the SS structure a more computational efficient treatment of large scale distributed systems is achieved.

FUNDED RESEARCH PROJECTS *Data-driven battery state of health Estimation*

**Epyon Power  
Delft, the Netherlands  
January 2009 – Present**

Development of a real time data-driven battery state of health estimator for fast charging management and control.

*Design of a Semi-active Steering Damper for Sport Motorcycles*

**Aprilia Brand, Piaggio Group  
Noale (VE), Italy  
April 2008 – October 2009**

Two-wheeled vehicles exhibit two oscillatory modes (wobble and weave) that can become unstable; the research carried out shows that by actively controlling the steering damping coefficient, vehicle stability and handling qualities can be improved.

*Electronic Redefinition of Four-wheeled Vehicle Lateral Dynamics*

**FIAT Group  
Torino, Italy  
May 2008 – December 2009**

The research is aimed at electronically redefining the behavior of the vehicle by acting through individual rear wheel braking. Experimental validation shows that the approach is successful in improving agility while cornering.

*Design of an Active Central Transfer Case Controller*

**FIAT Group  
Torino, Italy  
May 2008 – December 2009**

Front wheel drive and four wheel drive cars present a trade-off between performance and stability when accelerating in a corner. In this research an active central transfer case is used to improve stability and performance.

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*Design of a Lateral Drift Compensator for  
Four-wheeled Vehicles*

**FIAT Group  
Torino, Italy  
January 2008 – June 2008**

Lateral drift of a four-wheeled vehicle during braking may occur for several reasons; the aim of the research project is that of compensating the lateral drift via rear differential braking.

*Design of a Traction Control System for  
Motorbikes*

**Aprilia Brand, Piaggio Group  
Noale (VE), Italy  
April 2008 – November 2008**

Nonlinear systems identification and modeling techniques are employed to design a robust traction control system for two-wheeled vehicles. The system has been developed in collaboration with professional test riders.

*Identification of Engine-to-Slip Dynamics  
of a Superbike*

**Yamaha Superbike Team  
Lesmo (MI), Italy  
January 2008 – March 2008**

The research considers the problem of modeling the engine-to-slip dynamics. Instead of using the classical approach of multi-body modeling, this work takes the challenge of directly estimating the Input/Output slip dynamics by black-box identification, using the data collected with some experiments specifically designed for this purpose, and implemented on the real motorcycle.

*Design of Electronic Throttle Control for  
Racing Motorcycles*

**Aprilia Racing Team  
Noale (VE), Italy  
April 2007 – December 2007**

The research is devoted to the study of a servo-controller for an electronic throttle body (ETB) for ride-by-wire applications. Specifically, the open-loop dynamics of the system are studied in detail discussing the effects of friction based on appropriate experiments.

*SAFEBIKE*

**REGINS  
European Community Initiative  
April 2005 – June 2006**

The research goal is to develop a curve safe ABS for motorcycles. A motorcycle simulator is developed in Modelica, along with a model of an electro-hydraulic actuator. Tire characteristics are then used as the basis to develop an ABS controller that allows to safely negotiate braking while cornering.

*Design of the Attitude Control Sub-System  
for an Orbiting Particle Detector*

**Thales Alenia Space srl.  
Torino, Italy  
October 2006 – June 2007**

The research is aimed at investigating the possibility of put into orbit a particle detector (AMS02) on an artificial satellite. A reconfigurable and object oriented simulator is developed in Modelica language while a simplified linear periodic model is formulated and used to design the control law. A attitude reference generator is devised. The proposed control system allows to save up to 40% of propellant with respect to classical three axis controllers.

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*Modelization of a Common Rail for  
Gasoline Engines*

**FIAT Powertrain srl.  
Arese (MI), Italy  
June 2006 – February 2007**

An analytical, object oriented simulator is developed of a common rail engine is developed; the model parameters are identified and the simulator is validated using real data. Using the validated simulator, an analysis of the system dynamics is developed. This analysis provides a deep insight in the trade-offs involved in the choice of some components of the injection system.

### TEACHING STATEMENT

I consider teaching both a duty and an opportunity for a researcher. I consider it a duty, as there is no progress without diffusion of knowledge. Teaching is also an opportunity because preparing a course, explaining the material and finding new and student-tailored approaches are a useful practice that deepens ones knowledge of the subject.

I had my first teaching experience during my first years of college as a private tutor of high school students. I privately tutored several students in maths and physics. My experience then continued during my Ph.D. In graduate school, I served as a teaching assistant for several editions of three courses, an introductory course to linear dynamical systems for non-control major bachelor students, a graduate course in industrial robotics and a graduate course (thought for international student and thus taught in English) on System Identification and Adaptive Control. All appointments required recitation classes, office hours, computer lab exercises and grading exams. This experience gave me the possibility to face two different challenges. In the first class it was important to stimulate the students interest in a subject that was perceived as foreign to their economics major curriculum. The other two courses, being graduate level courses, challenged my teaching ability with more advanced material.

My teaching experience continued at TU Delft, here I am currently the responsible instructor for two graduate level automotive courses. It has been my responsibility to design the courses, choosing the material, the structure, the examination methods and teaching classes.

My past experiences lead me to the conclusion that the key to teaching is planning. I believe that good planning leads to good teaching. Knowing the subject is not enough; order is essential to teaching. And order is achieved through planning. Although I support the use of computer tools for teaching, I do not use them indiscriminately. Such tools are more suited for some courses than others. Courses (or parts of courses) that are mainly about ideas are best taught at blackboard pace. Instead, courses that are mainly about techniques can profit from computer-based interactive lectures. During my classes and in building relationships with students, I have always adopted an attitude that would hearten questions; as I believe that a class in which students are afraid to ask questions cannot be a successful class. As an instructor, I tried to be as accessible as possible to my students; not only in person but also providing good studying material.

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TEACHING  
EXPERIENCE

*Responsible Instructor*  
Delft, the Netherlands

**Delft University of Technology**  
**January 2010 – Present**

Responsible Instructor for the following Master of Science Courses:

*Vehicle Mechatronics* - 4 ETCS

Responsible Instructor for the following Master of Science Courses to be taught in 2011:

*Vehicle Dynamics B: Anti Lock Braking Systems* - 3 ETCS

*Teaching Assistant*  
Milan, Italy

**Politecnico di Milano**  
**April 2006 – Present**

Teaching assistant for the courses:

- *Robotic Industrial Manipulators* - graduate level - 3 editions - taught in Italian.
- *Introduction to Automatic Controls* - undergraduate level - 1 edition - taught in Italian.
- *Model Identification and Adaptive Systems* - graduate level - 1 edition - taught in English.

*Master's Theses Co-Advisor*  
Milan, Italy

**Politecnico di Milano and TU Delft**  
**January 2006 – Present**

Co-Advisor of the following Master of Science Theses:

- State Dependent Riccati Equation Optimal Vehicle Dynamics Control (2010) - TU Delft
- Model-Based Estimation of State of Charge of Lithium Cells (2010) - TU Delft
- Design and implementation of a load based ABS control algorithm (2010) - TU Delft
- Data-driven battery state of health Estimation (2010) - TU Delft
- ABS system on modern vehicles equipped with regenerative braking design issues (2010) - TU Delft
- Analysis and Design of a Cornering-Optimal Traction Control System for Two-Wheeled Vehicles (2009) - poliMI
- Analysis and Design of a Semi-Active Steering Damper for Two-Wheeled Vehicles (2008) - poliMI
- Analysis and Design of a Traction Control System for Two-Wheeled Vehicles (2008) - poliMI
- Analysis and Design of an Active Lateral Drift Compensator for Four-Wheeled Vehicles (2008) - poliMI
- Analysis and Design of a Electronic Throttle Body Control System for Racing Motorcycles (two projects: 2007-2008) - poliMI
- Analysis and Simulation of a Gasoline Common Rail Injection System (2006) - poliMI



## PRIZES

Best Papers published in Control Engineering Practice for the period 2008-2010 for the paper M. Corno, S. M. Savaresi, M. Tanelli, L. Fabbri. (2008) *On Optimal Motorcycle Braking*. Control Engineering Practice. Vol. 16, No. 6, pp. 644-657. doi:10.1016/j.conengprac.2007.08.001 . ISSN: 0967-0661.

"General Chairs' Recognition Award for Interactive Papers" for the paper Advanced Yaw Control of Four-wheeled Vehicles via Rear Active Differential Braking in interactive session in The Combined 48th IEEE Conference on Decision and Control and 28th Chinese Control Conference.

## CONFERENCES ATTENDANCE

- 1st Bicycle and Motorcycle Dynamics Symposium on the Dynamics and Control of Single Track Vehicles. Delft, The Netherlands. October 20-22, 2010.
- 2010 IEEE Multi-Conference on Systems and Control (MSC 2010), Yokohama, Japan, September 8-10 2010.
- 6th IFAC Symposium on Advances in Automotive Control. Munich, Germany. July 12-14, 2010.
- 47th IEEE Conference on Decision and Control, Cancun, Mexico. December 9-11, 2008
- 17th World Congress of International Federation of Automatic Control. Seoul, Korea. July 6-11, 2008.

## INVITED SPEECHES

- *Linear Parameter-Varying System Identification: the Subspace Approach*. 1st International Workshop on Identification in Automotive. Linz, Austria. July 15-16, 2010
- *Semi-active steering damper control in two-wheeled vehicles*. TU Delft. Delft, the Netherlands. February 2, 2009.
- *Closed loop identification of MIMO Hammerstein-Wiener models*. Opportunities for System Identification in Engine Modeling. KTH Stockholm, Sweden. March 17, 2010

## OTHER ACTIVITIES

Reviewer for the following International Journals: {Automatica, Transaction of Control System Technologies, International Journal of Robust and Nonlinear Control, Control Engineering Practice, Transactions on Intelligent Transportation Systems}.

Reviewer for several conferences in the Systems and Control community

Faculty Advisor for the automotive student teams at Delft Technical University. Provided supervision during the transition from gasoline powered car to electric car for the Formula Student team and provided supervision for the vehicle dynamics control program of Green Forze team (Hydrogen powered cart).

Participated to the organization of three editions of the Politecnico di Milano "open days" for perspective undergraduate and graduate students, and two editions of a similar initiative at TU Delft.

## SCIENTIFIC PUBLICATIONS

My publications are currently divided in eleven **(11)** papers on International Journals, twenty-one **(21)** papers on proceedings of International Conferences, four **(4)** filed Italian Patents, **(2)** filed Europeans Patents.

M. Corno, M. Tanelli, S. M. Savaresi, L. Fabbri, L. Nardo. (2010) *Design and Validation of a Gain-Scheduled Controller for the Electronic Throttle Body in Ride-by-Wire Racing Motorcycles*. IEEE Transactions on Control Systems Technology (to appear).

P. De Filippi, M. Tanelli, M. Corno, S.M. Savaresi, L. Fabbri (2010) *Semi-active steering damper control in two-wheeled vehicle*. IEEE Transactions on Control Systems Technology (to appear).

M. Corno, S. M. Savaresi. (2010) *Experimental Identification of Engine-to-Slip Dynamics for Traction Control Applications in a Sport Motorbike*. European Journal of Control 2010, vol. 16, no 1, pp. 88-108.

C. Vecchio, M. Tanelli, M. Corno, A. Ferrara, S. M. Savaresi. (2009) *Traction Control for Ride-by-Wire Sport Motorcycles: a Second Order Sliding Mode Approach*. IEEE Transactions on Industrial Electronics vol.56, no.9, pp.3347-3356, Sept. 2009. doi: 10.1109/TIE.2009.2018430. ISSN: 0278-0046.

M. Corno, S.M. Savaresi, G.J. Balas. (2008) *On Linear Parameter Varying (LPV) Slip-Controller Design for Two-Wheeled Vehicles*. International Journal of Robust and Nonlinear Control. International Journal of Robust and Nonlinear Control. vol. 19, no. 12, pages 1313-1336, August 2009. doi: 10.1002/rnc.1381. ISSN: 1099-1239.

M. Corno, S. M. Savaresi, R. Scattolini, E. Comignaghi, M. Sofia, A. Palma, E. Sepe. (2009) *Modeling, Parameter Identification and Dynamics Analysis of a Common Rail Injection System for Gasoline Engines*. International Journal of Vehicle Systems Modelling and Testing. Vol. 4, No.1/2 pp. 17 - 42. ISSN: 1745-6436.

G. Panzani, M. Corno, M. Tanelli, A. Zappavigna, S. M. Savaresi, A. Fortina, S. Campo. (2009) *On-Demand Four-Wheel-Drive Vehicles Design via Central Transfer Case Active Control*. IEEE Transactions on Intelligent Transportation Systems vol.PP, no.99, pp.1-11, 0. doi: 10.1109/TITS.2010.2055858. ISSN: 1524-9050.

M. Tanelli, M. Corno, I. Boniolo, S. M. Savaresi. (2009) *Active Braking Control of Two-Wheeled Vehicles on Curves*. International Journal of Vehicle Autonomous Systems, vol, 7, no 3-4 / 2009, pp. 243 - 269. doi: 10.1504/IJ-VAS.2009.033263. ISSN: 1471-0226

M. Corno, M. Lovera. (2008) *Spacecraft Attitude Dynamics and Control in the Presence of Large Magnetic Residuals*. Control Engineering Practice Vol. 17, No. 4, April 2009, Pages 456-468. doi: doi:10.1016/j.conengprac.2008.09.010. ISSN: 0967-0661.

M. Corno, S. M. Savaresi, M. Tanelli, L. Fabbri. (2008) *On Optimal Motorcycle Braking*. Control Engineering Practice. Vol. 16, No. 6, pp. 644-657. doi:10.1016/j.conengprac.2007.08.001 . ISSN: 0967-0661.

M. Corno, L. Fabbri, L. Nardo S. M. Savaresi, M. Tanelli. (2007) *Braking Optimal Maneuver: the Role of Front and Rear Tires in a Sport Motorbike*. Tire Technology International Review 2007, 2007, pp. 40-46.

PUBLICATIONS ON S. Formentin, M. Corno, S.M. Savaresi, L. Del Re, *Virtual Reference Feedback*  
INTERNATIONAL *Tuning of Internal Model Controllers*. Proceedings of the 49th IEEE Conference  
CONFERENCES on Decision and Control (to appear)

M. Corno, M. Massaro, R. Lot, S.M. Savaresi *On Linear-Parameter-Varying Roll Angle Controller design for Two-Wheeled Vehicles*. Bicycle and Motorcycle Dynamics 2010 Symposium on the Dynamics and Control of Single Track Vehicles, Delft, The Netherlands . ISBN: 978 94911 04015.

P. De Filippi, M.Tanelli, M. Corno., S.M. Savaresi, L. Fabbri (2010) *Design of steering angle observers for the active control of two-wheeled vehicles*. Proceedings of the 2010 IEEE Multi-Conference on Systems and Control (MSC 2010), Yokohama, Japan, September 8-10 2010, pp. 155-160.

E. de Bruijn, M. Corno, M.Gerard, M. Verhaegen and E. Holweg (2010) *On the performance increase of wheel deceleration control through force sensing*. . Proceedings of the 2010 IEEE Multi-Conference on Systems and Control (MSC 2010), Yokohama, Japan, September 8-10 2010, pp. 161-166.

P. De Filippi, M. Tanelli, M. Corno, S.M. Savaresi (2010) *Toward Electronic Stability Control for Two-Wheeled Vehicles*. Proceedings of the 2010 ASME Dynamic Systems and Control Conference (DSCC 2010), Boston, MA, USA, September 13-15, 2010. in MoBT3.2.

M. Gerard, M. Corno, M.Verhaegen, E. Holweg (2010) *Two-phase Anti-lock Braking System using Force Measurement*. Proceedings of the 10th International Symposium on Advanced Vehicle Control. Loughborough, UK. August 22-26 2010. in AVON.

P. De Filippi, M. Tanelli, M. Corno, S.M. Savaresi, L. Fabbri (2010) *Design of semi-active steering damper control strategies for sport motorcycles*. Proceedings of the 2010 IFAC Symposium on Advances in Automotive Control. Munich, Germany. July 12-14, 2010. In WA2.3.

M. Corno, M. Tanelli, I. Boniolo, S. M. Savaresi.(2009) *Advanced Yaw Control of Four-wheeled Vehicles via Rear Active Differential Braking*. Proceedings of the 48th IEEE Conference on Decision and Control, 2009 held jointly with the 2009 28th Chinese Control Conference. CDC/CCC 2009, pp.5176-5181, 15-18 Dec. 2009 doi: 10.1109/CDC.2009.5399843.

G. Panzani, M. Corno, M. Tanelli, A. Zappavigna, S.M. Savaresi, A. Fortina, S. Campo (2009). *Combined Performance and Stability Optimisation via Central Transfer Case Active Control in Four-Wheeled Vehicles*. . Proceedings of the 48th IEEE Conference on Decision and Control, 2009 held jointly with the 2009 28th Chinese Control Conference. CDC/CCC 2009, 15-18 Dec. 2009. doi: 10.1109/CDC.2009.5400127.

G. Panzani, M. Corno, M. Tanelli, S. M. Savaresi, A. Fortina, S. Campo. (2009) *Control-Oriented Vehicle Attitude Estimation with Online Sensors Bias Compensation*. Proceedings of the 2nd ASME Annual Dynamic Systems and Control Conference (DSCC09), October 12-14, 2009 , Hollywood, CA, USA. pp. 819-826. doi:10.1115/DSCC2009-2531. ISBN: 978-0-7918-4892-0.

M. Corno, G. Panzani, G. Maggio, P. Mazzocchi, A. Goggi, S. M. Savaresi. (2009) *Nonlinear Modeling and Control of a Dual-Stage Hybrid Ride-by-Wire Throttle Body for a Sport Motorbike*. . Proceedings of the 2nd ASME Annual Dynamic Systems and Control Conference (DSCC09), October 12-14, 2009. Hollywood, CA, USA. pp. 827-833. doi:10.1115/DSCC2009-2534. ISBN: 978-0-7918-4892-0.

M. Corno, S. M. Savaresi. (2009) *Experimental Identification of Rear Wheel Slip Dynamics of a Motorbike*. Proceedings of the 15th IFAC Symposium on System Identification. Saint-Malo, France July 6-8, 2009. pp. 1229- 1234. doi: 10.3182/20090706-3-FR-2004.00204

M. Tanelli, M. Corno, P. De Filippi, S. Rossi, S.M. Savaresi, L. Fabbri. (2009) *Control-oriented Steering Dynamics Analysis in Sport Motorcycles: Modeling, Identification and Experiments*. . Proceedings of the 15th IFAC Symposium on System Identification. Saint-Malo, France July 6-8, 2009. pp. 468-473. doi: 10.3182/20090706-3-FR-2004.00077.

C. Vecchio, M. Tanelli, M. Corno, A. Ferrara, S. M. Savaresi. (2009) *Second Order Sliding Mode for Traction Control in Ride-by-Wire Sport Motorcycles*. . Proceedings of the 2009 American Control Conference. St. Louis, MO, USA. June 10-12, 2009. pp. 3344-3349.

M. Corno, S.M. Savaresi, G.J. Balas (2008). *Linear, Parameter-Varying Wheel Slip Control for Two-Wheeled Vehicles*. Proceedings 47th IEEE Conference on Decision and Control, Cancun, Mexico. December 9-11, 2008. pp.5030-5035. doi: 10.1109/CDC.2008.4738924.

M. Corno, M. Tanelli, S.M. Savaresi, L. Fabbri, L. Nardo (2008). *Electronic Throttle Control for Ride-by-Wire in Sport Motorcycles*. Proceedings of the IEEE Multi-conference on Systems and Control, San Antonio, Texas, USA. September 3-5, 2008. pp. 233-238. doi: 10.1109/CCA.2008.4629640.

M. Corno, M. Lovera. (2008). *Spacecraft Attitude Dynamics and Control in the Presence of Large Magnetic Residuals*. Proceedings of 17th World Congress of International Federation of Automatic Control. Seoul, Korea. July 6-11, 2008. pp. 14054-14059.

M. Corno, E. Comignaghi, A. Palma, E. Sepe, S. M. Savaresi, R. Scattolini, M. Sofia. (2008). *Modeling, Parameter Identification and Dynamics Analysis of a Common Rail Injection Control System for Gasoline Engines*. Proceedings of 17th World Congress of International Federation of Automatic Control. Seoul, Korea. July 6-11, 2008. pp. 8481-8486.

M. Corno, S. M. Savaresi, R. Scattolini. (2008). *Object Oriented Modeling of a Gasoline Direct Injection System*. Object Oriented Modeling of a Gasoline Direct Injection System. Proceedings of 2008 Modelica Conference. Bielefeld, Germany. March 3-4, 2008. pp. 83-91.

M. Corno, M. Tanelli, S. M. Savaresi. (2007) *High Performance Braking for Racing Motorcycles*. Proceedings of the European Control Conference 2007 - ECC 2007 - July 2-5 2007, Kos, Greece, pp. 5225-5232.

M. Corno, M. Zefran. (2006) *Haptic Playback: Modeling, Control Design and Stability Analysis*. Proceedings of the 2nd Robotics: Science and Systems Conference, Philadelphia, USA. August 2006. Available online <http://www.roboticsproceedings.org/rss02/index.html>.

#### PATENTS

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MI2010A 000877 (2010). Italian Patent. *Metodo di controllo della trazione per partenze da fermo in un motoveicolo ed apparato implementante lo stesso*. Piaggio & C. S.p.A, Politecnico di Milano (G. Panzani, M. Corno, S.M. Savaresi, L. Fabbri, A. Ricci, F. Fioravanzo, P.Lisanti). Filed on 17/5/2010.

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