

# SIMONE FORMENTIN'S CURRICULUM VITAE

UPDATED: OCTOBER 31, 2017

## PERSONAL DATA

*Name:* Simone Formentin

*Date of birth:* February 23, 1984

*Place of birth:* Legnano (MI), Italy

*Address:* Via Tortona, 2 - 21052 Busto Arsizio (VA), Italy

*Family status:* Married, father of Luna (born June 16, 2014) and Andrea (born January 8, 2016)

*E-mail:* [simone.formentin@polimi.it](mailto:simone.formentin@polimi.it)

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## CURRENT POSITION

### October 2016 – Today

Tenure-track Assistant Professor. Italian qualification for associate professorship, section 09/G1 (Automatica) obtained on April 07, 2017.

DIPARTIMENTO DI ELETTRONICA, INFORMAZIONE E BIOINGEGNERIA, POLITECNICO DI MILANO, ITALY

## PREVIOUS POSITIONS

### March 2014 – September 2016

Fixed-term Assistant Professor

DIPARTIMENTO DI ELETTRONICA, INFORMAZIONE E BIOINGEGNERIA, POLITECNICO DI MILANO, ITALY

### September 2012 – February 2014

Post-doctoral Fellow

DIPARTIMENTO DI INGEGNERIA GESTIONALE, DELL'INFORMAZIONE E DELLA PRODUZIONE, UNIVERSITÀ DEGLI STUDI DI BERGAMO, ITALY

### December 2011 – August 2012

Post-doctoral Fellow

LABORATOIRE D'AUTOMATIQUE, EPFL LAUSANNE, SWITZERLAND

## EDUCATION

### Ph.D. in Information Technology (with Doctor Europæus certification) February 2012

POLITECNICO DI MILANO, ITALY

Thesis title: “Direct data-driven control system design: theory and applications” (in English)

Advisor: Prof. Sergio M. Savaresi, Grade: A *summa cum laude*

Reviewers: Prof. Michel Verhaegen (TU Delft, The Netherlands), Prof. Lars Eriksson (Linköping University, Sweden)

### Qualifier exam to practice the profession of ICT engineering September 2009

POLITECNICO DI MILANO, ITALY

### Master of Science in Automation Engineering December 2008

POLITECNICO DI MILANO, ITALY

Thesis title: “Analisi e sviluppo di un sistema di controllo trazione per veicoli a due ruote” (in Italian)

Advisor: Prof. Sergio M. Savaresi (in collaboration with Aprilia S.p.A.), Grade: 110/110 *summa cum laude*

### Bachelor of Science in Automation Engineering September 2006

POLITECNICO DI MILANO, ITALY

Thesis title: “Dimensionamento e controllo di un microgeneratore ad energia alternativa” (in Italian)

Advisor: Prof. Marco Mauri, Grade: 110/110 *summa cum laude*

### Diploma di Maturità Scientifica July 2003

High-school diploma specializing in scientific studies

LICEO SCIENTIFICO GALILEO GALILEI, LEGNANO (MILANO), ITALY, Grade: 100/100 *with honors*

## VISITING APPOINTMENTS

**June 2017**

Visiting professor at ELEC, Vrije Universiteit Brussels, Belgium

**April–May 2017**

Visiting professor at GIPSA-Lab, Université Grenoble Alpes, France

**September–November 2015, May–July 2016**

Visiting professor at Dipartimento di Scienze e Metodi dell'Ingegneria, University of Modena and Reggio Emilia (UNIMORE), Italy

**May 2015, June 2016**

Visiting researcher at Department of Automatic Control, KTH Stockholm, Sweden

**November 2012, September 2013**

Visiting researcher at the Department of Electrical Engineering, TU Eindhoven, The Netherlands

**June 2012, April 2015**

Visiting researcher at the Laboratoire d'Analyse et d'Architecture des Systèmes, CNRS Toulouse, France

**July 2010, January 2011, August 2011**

Visiting scholar at the Laboratoire d'Automatique, EPFL Lausanne, Switzerland

**March 2010**

Visiting scholar at the Delft Center for Systems and Control, TU Delft, The Netherlands

**January 2009 – March 2013**

Visiting scholar (5 months during the Ph.D. program + several short-term stays) at the Institute for Design and Control of Mechatronic Systems, JKU Linz, Austria

## RESEARCH ACTIVITY

**1. Direct data-driven control system design**

For many industrial applications, finding a model from physical laws that is both simple and reliable for control design is a tough undertaking. When a set of measurements is available, the control law can be computed from data without relying on knowledge of the underlying physics. Specifically, in “indirect” data-driven approaches, a model of the system is first derived from data and then a controller is computed based on such a model. In “direct” data-driven approaches, the controller is directly derived from experimental data, such that process dynamics are automatically considered relevant or not, depending only on their weight on the final control index. The main advantages of such techniques are that they are insensitive to modeling errors and less time-consuming.

The first aim of this research work is to develop mathematical tools so as to extend existing data-driven methods to a larger class of industrially relevant problems. These methodological extensions include

- extensions to system identification and estimation methods [CS2, C61, C33, C62] (in collaboration with Università degli studi di Brescia)
- direct data-driven control of time-delay systems [J1, C1] (in collaboration with JKU);
- mixed-sensitivity loop-shaping control design [J7, C11] (in collaboration with EPFL);
- data-driven control in the frequency domain [C58, CS1] (in collaboration with ONERA);
- controller identification using closed-loop experiments [C19] (in collaboration with JKU);
- data-driven control of non-minimum phase plants [C50];
- one-shot tuning of cascade schemes [C10];
- PID tuning using deterministic VRFT [C34] (in collaboration with Università degli studi di Brescia);
- data-driven control of MIMO plants [J2, C7, C40] (in collaboration with JKU Linz and TU Eindhoven);
- data-driven control of LPV systems [J17, C12, C18, C28, C41] (in collaboration with TU Eindhoven and IMT Lucca);
- direct data-driven feed-forward linearization [J4, C6] (in collaboration with TU Delft).
- robustification of data-driven tuning [J26, C51];

- data-driven control of nonlinear systems [C39, C44, J21, C56, J28] (in collaboration with Politecnico di Torino).

Furthermore, since it is common belief that finding a good model of the plant is always the best way towards controller design, a secondary goal of this activity is to provide a quantitative assessment of direct data-driven techniques and show whether - and in which cases - they might be preferable (see [J14, C23]).

Finally, since it can be proven that the weak point of direct data-driven methods is their statistical performance, a third aim of this activity is to find mathematical solutions to improve the overall efficiency of the controller estimate. From this perspective, two directions are addressed, namely

- optimal experiment design [J6, C2, C17, B2] (in collaboration with EPFL, KTH and JKU Linz);
- $L_2$  regularization [J10, C20] (in collaboration with EPFL).

## 2. Intelligent vehicles and transportation systems

Nowadays, vehicle systems are definitely among the most challenging platforms for research in automatic control. As a matter of fact, almost all categories of vehicles are now equipped with sophisticated sensors and electronic control units able to process the available information on engine and vehicle dynamics. It follows that this information can be exploited to act on the vehicle, *e.g.*, to increase the level of safety, decrease the fuel consumption, deal with environmental constraints. Moreover, “smart vehicles” can be used to communicate among each other towards the establishment of “smart cities” with sustainable transports and optimized traffic flows. In this interesting field, the research activity is specifically focused on:

- $\text{NO}_x$  and exhaust manifold pressure estimation via in-cylinder pressure measurement [J9, J15, J3, J5, C16] (in collaboration with JKU and Liebherr GmbH);
- longitudinal and lateral motorcycle dynamics, *e.g.* traction, braking and stability control [P1, B1, C9, C3, C13, C30] (partially in collaboration with TU Delft and Aprilia SpA);
- Diesel engine control [J15, J11, C14] (in collaboration with JKU);
- design of electric and hybrid powertrains [C15, C5, C4, J19, J23, C32, C43, C42, C55, C37] (in collaboration with RSE SpA, Italianimoto Srl, EP Tender Sas, Blubrake Srl and Zehus Srl);
- vehicle sharing systems and green mobility [J12, C26, C38, C54, CS4, P4, P2];
- design and control of Brake-By-Wire (BBW) systems [J20, C30];
- Control of unmanned rotorcrafts [C8, C24, C45, C48];
- Marine vehicle technology [J8, C22, J18];

## 3. Other research activities (with at least one publication)

- Anti-windup systems [J24, C27, C29, C36] (in collaboration with LAAS CNRS Toulouse, IEIIT CNR Torino and Università degli studi di Trento)
- Robotics and mechatronics [C35, J13, C25, C31, J22, C52, C53, C59, JS3]
- Business analytics and finance [C57, CS3]

## TEACHING ACTIVITY

### Lecturer

Course:	Control-oriented identification (in English) <b>Ph.D. course</b>
Academic Year:	2016/2017
Class Hours per Year:	8
University:	Vrije Universiteit Brussels
Course:	Identification for control (in English) <b>Ph.D. course</b>
Academic Year:	2016/2017
Class Hours per Year:	6
University:	Université Grenoble Alpes

- Course: Data-driven control system design (in English)  
**Ph.D. course**
- Academic Year: 2014/2015 - 2016/2017  
Class Hours per Year: 20 - 20  
University: Politecnico di Milano
- Course: Optimal filtering and data analysis: from Kolmogorov-Wiener to Kalman  
(in English, co-taught with S. Bittanti, P. Bolzern, M. Farina, S. Garatti,  
G. De Nicolao, M. Prandini, S.M. Savaresi)  
**Ph.D. course**
- Academic Year: 2015/2016  
Class Hours per Year: 3  
University: Politecnico di Milano
- Course: Advanced data-driven methods for modeling and control (in English)  
**Ph.D. course**
- Academic Year: 2014/2015  
Class Hours per Year: 20  
University: Università degli studi di Bergamo
- Course: Fundamentals of Automatic Control (in Italian)  
B.Sc. course
- Academic Year: 2016/2017 - 2017/2018  
Class Hours per Year: 42 - 42  
University: Politecnico di Milano
- Course: Modeling, Identification and Simulation (in Italian)  
Post-graduate Master program in Adaptive Manufacturing
- Academic Year: 2014/2015 - 2015/2016  
Class Hours per Year: 30 - 50  
University: Università di Modena e Reggio Emilia (UNIMORE)
- Course: Model Identification and Data Analysis (in Italian)  
M.Sc. course
- Academic Year: 2012/2013 - 2013/2014 - 2014/2015 - 2015/2016 - 2016/2017  
Class Hours per Year: 60 - 60 - 48 - 48 - 48  
University: Università degli studi di Bergamo
- Course: Model Identification and Data Analysis (in English)  
M.Sc. course
- Academic Year: 2013/2014 - 2014/2015 - 2015/2016 - 2016/2017  
Class Hours per Year: 32 - 32 - 30 - 30  
University: Politecnico di Milano
- Course: Model Identification and Adaptive Systems (in English)  
M.Sc. course
- Academic Year: 2012/2013  
Class Hours per Year: 30  
University: Politecnico di Milano

**Tutorial Classes**

Course:	Fundamentals of Automatic Control (in Italian) B.Sc. Course – Teacher: Prof. P. Bolzern
Academic Year:	2015/2016
Class Hours per Year:	6
University:	Politecnico di Milano
Course:	Model Identification and Data Analysis II (in Italian) M.Sc. course – Teacher: Prof. S. Bittanti
Academic Year:	2013/2014
Class Hours per Year:	20
University:	Politecnico di Milano
Course:	Model Identification and Data Analysis (in Italian) M.Sc. Course – Teacher: Prof. S. Bittanti
Academic Year:	2012/2013 - 2014/2015 - 2015/2016
Class Hours per Year:	20 - 20 - 20
University:	Politecnico di Milano
Course:	Model Identification and Data Analysis (in English) M.Sc. Course – Teacher: Prof. S.M. Savaresi
Academic Year:	2012/2013
Class Hours per Year:	20
University:	Politecnico di Milano
Course:	Automatic Control (in Italian) M.Sc. Course – Teacher: Prof. N. Schiavoni
Academic Year:	2009/2010 - 2010/2011
Class Hours per Year:	37 - 34
University:	Politecnico di Milano
Course:	Model Identification and Data Mining (for Biomedical Engineering, in Italian) M.Sc. Course – Teacher: Prof. S.M. Savaresi
Academic Year:	2009/2010 - 2010/2011 - 2014/2015
Class Hours per Year:	28 - 12 - 28
University:	Politecnico di Milano
Course:	Advanced process control (in Italian until 2014/2015, then in English) M.Sc. Course – Teacher: Prof. F. Casella
Academic Year:	2008/2009 - 2009/2010 - 2010/2011 - 2012/2013 - 2014/2015 - 2015/2016
Class Hours per Year:	8 - 6 - 6 - 8 - 6 - 4
University:	Politecnico di Milano

**Ph.D. Theses Advisor or Co-Advisor**

- *Robustness in data-driven control: theory and automotive applications* - Ph.D. program in Information Technology, Politecnico di Milano. Student: G. Rallo. Politecnico di Milano, November 2017.
- *Optimal energy management of series hybrid electric vehicles* - Ph.D. program in Information Technology, Politecnico di Milano. Student: J. Guanetti. Politecnico di Milano, December 2015.

**M.Sc. Theses Advisor or Co-Advisor**

- *Analisi e sviluppo di un metodo di approssimazione stocastica delle matrici di covarianza del rumore nel filtraggio alla Kalman (in Italian)* - M.Sc. program in Computer Science and Engineering, Politecnico di Milano. Student: A. Meazzi. Academic Year 2016-2017.

- *A Kalman Filtering approach for traffic matrix estimation in computer networks (in English)* - M.Sc. program in Computer Science and Engineering, Politecnico di Milano. Student: G. Pozzi. Academic Year 2016-2017.
- *Direct data-driven control of cavity tuners in particle accelerators (in English)* - M.Sc. program in Engineering Physics, Politecnico di Milano. Student: R. Loddo. Academic Year 2016-2017.
- *Stock trading via feedback control: an extremum seeking approach (in English)* - M.Sc. program in Management Engineering, Politecnico di Milano. Student: C. Cantaro. **Unique advisor.** Academic Year 2015-2016.
- *Identificazione semi-supervisionata di modelli NFIR (in Italian)* - M.Sc. program in Computer Science and Engineering, Università degli Studi di Bergamo. Student: M. Scandella. Academic Year 2015-2016.
- *Analisi e sviluppo di un sistema di monitoraggio della pressione pneumatici per veicoli a due ruote (in Italian)* - M.Sc. program in Automation Engineering, Politecnico di Milano. Student: S. Della Pietra. Academic Year 2015-2016.
- *Il filtro particellare per la diagnostica dei guasti in ambito aerospaziale (in Italian)* - M.Sc. program in Computer Science and Engineering, Università degli Studi di Bergamo. Student: G. Maroni. Academic Year 2014-2015.
- *Analisi e sviluppo di un sensore virtuale della pressione dei pneumatici per veicoli stradali (in Italian)* - M.Sc. program in Automation Engineering, Politecnico di Milano. Student: L. Onesto. Academic Year 2014-2015.
- *Analisi e sviluppo di un sistema per la valutazione dello stile di guida nei trattori agricoli (in Italian)* - M.Sc. program in Automation Engineering, Politecnico di Milano. Student: R. Tasseti. Academic Year 2014-2015.
- *Controllo MIMO  $D^2$ -IBC: teoria e applicazione al controllo di stabilità di un autoveicolo a guida autonoma (in Italian)* - M.Sc. program in Automation Engineering, Politecnico di Milano. Student: O. Gallupi. Academic Year 2014-2015.
- *Modelli dinamici per l'interpretazione e la predizione di dati di ascolto televisivo (in Italian)* - M.Sc. program in Computer Science and Engineering, Politecnico di Milano. Student: A. Mosconi. Academic Year 2013-2014.
- *Approcci data-based diretti per il progetto di controllori robusti con applicazione in ambito automotive (in Italian)* - M.Sc. program in Automation Engineering, Politecnico di Milano. Student: M. Vanoncini. Academic Year 2013-2014.
- *Algoritmi real-time per l'ottimizzazione della velocità di una barca a vela (in Italian)* - M.Sc. program in Automation Engineering, Politecnico di Milano. Student: A. Testa. Academic Year 2013-2014.
- *Analisi dinamica di devices di rete: modellistica e predizione (in Italian)* - M.Sc. program in Automation Engineering, Politecnico di Milano. Students: P. Giambi and E. Zappella. Academic Year 2012-2013.
- *Modellistica di un electric power steering e sviluppo di algoritmi per la riduzione della coppia di cogging (in Italian)* - M.Sc. program in Automation Engineering, Politecnico di Milano. Student: M. Martines. Academic Year 2011-2012.
- *Analisi, sviluppo e ottimizzazione energetica del sistema elettronico di controllo di uno scooter elettrico (in Italian)* - M.Sc. program in Electronic Engineering, Politecnico di Milano. Students: M. Bongiorno, C. Rainato. Academic Year 2009-2010.

- *Progetto e analisi di efficienza di un azionamento per motore brushless di una bicicletta a pedalata assistita (in Italian)* - M.Sc. program in Electronic Engineering, Politecnico di Milano. Student: L. Visconti. Academic Year 2008-2009.

### Mathematics and Physics Tutor

- Individually tutored high school students in Mathematics and Physics - Period: 2002-2008

### INDUSTRIAL COLLABORATIONS

- *Black-box aging estimation in vehicle dampers*, within a research contract between Politecnico di Milano and Maserati Spa (Modena, Italy) - 2017.
- *Data-driven estimation of a vehicle COG via suspension and inertial measurements*, within a research contract between Politecnico di Milano and Maserati Spa (Modena, Italy) - 2017.
- *GPS and inertial measurement based speed and heading estimation in boats*, within a research contract between Politecnico di Milano and Astrayacht Srl (Monfalcone - GO, Italy) - 2017.
- *Mixed cost/noise optimization for extended range electric vehicles*, within a research contract between Politecnico di Milano and Steyr Motors GmbH (Steyr, Austria) - 2017.
- *Black-box vehicle modeling for sideslip angle estimation*, within a research contract between Politecnico di Milano and Ferrari Spa (Maranello - MO, Italy) - 2017.
- *Data-driven mass estimation in tilting vehicles*, within a research contract between Politecnico di Milano and Piaggio Spa (Pontedera - PI, Italy) - 2017.
- *Clamping force estimation in brake-by-wire actuators*, within a research contract between Politecnico di Milano and Brembo Spa (Curno - BG, Italy) - 2017.
- *Automatic calibration of power-meters for high performance bikes*, within a research contract between Politecnico di Milano and Favero Electronics Srl (Arcade - TV, Italy) - 2016.
- *Clamping force estimation in electric parking brakes*, within a research contract between Politecnico di Milano and Brembo Spa (Curno - BG, Italy) - 2016.
- *Indirect TPMS for two-wheeled vehicles*, within a research contract between Politecnico di Milano and Ducati Spa (Borgo Panigale - BO, Italy) - 2016.
- *Driving style estimation in tractors*, within a research contract between Politecnico di Milano, E-Novia Srl and Argo Tractors Spa (Fabbrico - RE, Italy) - 2015/2016.
- *Advanced business analytics with system identification techniques*, within a research contract between Politecnico di Milano, E-Novia Srl and Pastificio Rana Spa (Verona - Italy) - 2015.
- *Indirect and hybrid TPMS via advanced estimation techniques*, within a research contract between Politecnico di Milano and Maserati Spa (Modena, Italy) - 2014/2015.
- *Automatic MOB (Man On Board) recovery*, within a research contract between Politecnico di Milano and Blupassion Srl (Santa Maria la Longa - UD, Italy) - 2014.
- *Energy optimization for extended range electric vehicles*, within a research contract between Politecnico di Milano and EP Tender Sas (Poissy Cedex, France) - 2013/2014.
- *Feedback control of gravimetric blenders for polymer processes*, within a research contract between Università degli studi di Bergamo and Doteco Spa (Mirandola - MO, Italy) - 2013.
- *Data-driven corrections of wind sensor errors in sailboats*, within a research contract between Politecnico di Milano and Astrayacht Srl (Monfalcone - GO, Italy) - 2013.

- *Data-driven emission modeling for Diesel engines*, within a research contract between Johannes Kepler University of Linz and Liebherr GmbH (Linz, Austria) - 2011.
- *Innovative control algorithms for lightweight electric vehicles*, within a research contract between Politecnico di Milano and Italiainmoto Srl (Osio Sopra - BG, Italy) - 2009/2010.
- *Traction control for drive-by-wire applications in racing motorbikes*, within a research contract between Politecnico di Milano and Aprilia Spa (Noale - VE, Italy) - 2008.

#### GRANTS AND CONTRACTS

- *GPS and inertial measurement based speed and heading estimation in boats*, between Politecnico di Milano and Astrayacht Srl (Monfalcone - GO, Italy), funding: 15k€, 2017
- 2017 one-month visiting fellowship at Université Grenoble Alpes, France (1st ranked)

#### PARTICIPATION IN REGIONAL, NATIONAL AND INTERNATIONAL RESEARCH PROJECTS

- *i-Share*  
Period: 11/2016-4/2018  
Partners: E-novia Spa, Zed Milano Srl, Politecnico di Milano  
Funded by: Regione Lombardia
- *Adaptive Suspension Control for Bicycle*  
Period: 7/2016-12/2017  
Partners: E-shock Srl, Bertone Design Srl, Politecnico di Milano  
Funded by: Regione Lombardia (Smart Fashion and Design call)
- *New methods for Identification and Adaptive Control for Industrial Systems*  
Period: 1/2009-12/2011  
Partner: Politecnico di Milano  
Funded by: MIUR (Italian Ministry for University and Research)
- *Methods and tools of self-optimizing control of complex mechatronical systems*  
Period: 1/2009-12/2011  
Partners: Johannes Kepler University of Linz, Politecnico di Milano, Imperial College London, Katholieke Universiteit Leuven.  
Funded by: ACCM (Austrian Center of Competence in Mechatronics)

#### PARTECIPATION IN SCIENTIFIC EVENTS

##### Committees

- Member of the international program committee of the 18th IFAC Symposium on System Identification (SYSID), Stockholm, Sweden, July 9-11, 2018.
- Member of the international program committees of the 9th IFAC/IEEE Symposium on Robust Control Design (ROCOND) and the 2nd IFAC Workshop on Linear Parameter Varying Systems (LPVS), to be held jointly in Florianópolis, Brasil, September 3-5, 2018.
- Member of the international program committee of the 1st IFAC workshop on Linear Parameter Varying Systems (LPVS), Grenoble, France, September 7-9, 2015.
- Member of the national program committee of the Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), Bergamo, Italy, September 8-10, 2014.

##### Attendance to international conferences/workshops

- "25th ERNSI Workshop", Lyon, France, September 24-27, 2017.
- "BITFEST: Perspectives on System Identification and Control Science", Como, Italy, July 17-18, 2017.
- "20th IFAC World Congress", Toulouse, France, July 9-14, 2017.
- "55th IEEE Conference on Decision and Control", Las Vegas, NV, USA, December 12-14, 2016.



- "24th ERNSI Workshop", Cison di Valmarino, Italy, September 25-28, 2016.
- "17th IFAC Symposium on System Identification", Beijing, China, October 19-21, 2015.
- "1st IFAC Workshop on Linear Parameter Varying Systems", Grenoble, France, October 7-9, 2015.
- "53rd IEEE Conference on Decision and Control", Los Angeles, CA, USA, December 15-17, 2014.
- "22nd ERNSI Workshop", Ostend, Belgium, September 21-24, 2014.
- "19th IFAC World Congress", Cape Town, South Africa, August 25-29, 2014.
- "52nd IEEE Conference on Decision and Control", Firenze, Italy, December 10-13, 2013.
- "ASME Dynamic Systems and Control Conference 2013", Stanford, CA, USA, October 21-23, 2013.
- "12th European Control Conference 2013", Zurich, Switzerland, July 17-19, 2013.
- "16th IFAC Symposium on System Identification", Brussels, Belgium, July 11-13, 2012.
- "50th IEEE Conference on Decision and Control", Orlando, FL, USA, December 12-15, 2011.
- "18th IFAC World Congress", Milano, Italy, August 28 - September 2, 2011.
- "49th IEEE Conference on Decision and Control", Atlanta, GA, USA, December 13-15, 2010.
- "8th IFAC Symposium on Nonlinear Control Systems", Bologna, Italy, September 1-3, 2010.

#### **Attendance to national conferences/workshops**

- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), Milan, Italy, September 11-13, 2017.
- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), Bergamo, Italy, September 8-10, 2014.
- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), Palermo, Italy, September 16-18, 2013.
- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), Benevento, Italy, September 12-14, 2012.
- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), L'Aquila, Italy, September 13-15, 2010.

#### EDITORIAL ACTIVITY

##### **Editorships**

Since 2015, he is an Associate Editor of the Conference Editorial Board of the IEEE Control System Society.

##### **Reviews**

Since 2009, he has served as a reviewer for Automatica, IEEE Transactions on Automatic Control, International Journal of Adaptive Control and Signal Processing, Control Engineering Practice, IEEE Transactions on Control Systems Technology and for several IFAC/IEEE conferences.

##### **Memberships**

- He is a member of the Institute of Electrical and Electronics Engineers (IEEE) and the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.).
- He is a member of the following technical committees (TCs): IEEE TC on System Identification and Adaptive Control (TC-SIAC), IFAC TC on Modelling, Identification and Signal Processing, IFAC TC on Robust Control.
- He is the Social Media representative for the IFAC TC on Robust Control.

#### AWARDS

**"Best Young Author Journal Paper Award"** of the Italy Chapter of the IEEE Control Systems Society for the paper "Robust Linear Static Anti-Windup With Probabilistic Certificates". Motivation: *"The paper proposes a novel and promising paradigm for approaching robust static anti-windup design and performance analysis for saturated linear closed loops in the presence of nonlinear probabilistic parameter uncertainties via randomized techniques"*. Milan, Italy **June 2017**

**"Technical innovation Prize"** for the driving style estimator developed with Argo Tractors Spa at EIMA International Exposition 2016, Bologna, Italy **November 2016**

**Best oral presentation award** at the Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), Bergamo, Italy **September 2014**

**“Famiglia Legnanese” award for best students in AltoMilanese** funded by Quaglia & Colombo s.r.l., Legnano, MI (Italy) **December 2008**

#### INVITED TALKS

- *Robust anti-windup augmentation via randomized optimization.*  
GIPSA-Lab, Université Grenoble Alpes, France, May 18, 2017.
- *Direct design of LPV controllers from data.*  
Department of Automatic Control, Lund University, Sweden, August 26, 2015.
- *Direct data-driven control of linear parameter-varying systems.*  
Dynamical Systems Control and Optimization (DYSCO) research unit, IMT Lucca, Italy, July 08, 2015.
- *Recent results and open issues in direct data-driven control system design*  
Department of Automatic Control, KTH Stockholm, Sweden, May 04, 2015.
- *Direct control system design from data: overview and new challenges*  
ONERA DCSD, Toulouse, France, April 16, 2015.
- *On robust static anti-windup augmentation with probabilistic certificates*  
Laboratoire d'Analyse et d'Architecture des Systèmes, CNRS Toulouse, France, April 14, 2015.
- *Learning controllers from data: overview and new perspectives*  
EECS, UC Berkeley, California (USA), October 24, 2013.
- *“To model or not to model”: an insight into control system design using experimental data*  
Department of Electrical Engineering, TU Eindhoven, The Netherlands, September 11, 2013.
- *A comparison between model-based and data-driven control system design*  
Laboratoire d'Automatique, EPFL Lausanne, Switzerland, April 12, 2013.
- *Tuning controllers from data: a statistical perspective*  
Laboratoire d'Analyse et d'Architecture des Systèmes, CNRS Toulouse, France, June 12, 2012.

#### PERSONAL SKILLS, COMPETENCES AND ACTIVITIES

##### Languages

Italian (Mother tongue), English (C1 level, TOEFL iBT 2008), French (B1 level, DELF 2003)

##### Computer skills and competences

Operative systems: Windows, Mac OS  
Software packages: Office, Matlab, Simulink, BikeSim, CarSim  
Programming: C, C++

##### Sports

Judo Black belt I Dan, Karate V kyu, Ninjitsu I kyu, Swimming, Skiing

##### Artistic skills and competences

Bass-guitar, organ

##### Voluntary work

Fellow of the italian association of blood donors (AVIS) since 2002

##### Driving licence

Car licence (international)

## PUBLICATIONS

**International Journals***Published/accepted*

- [J28] C. Novara, S. FORMENTIN  
*Data-driven inversion-based control of nonlinear systems with guaranteed closed-loop stability.*  
IEEE Transactions on Automatic Control. Accepted. DOI: 10.1109/TAC.2017.2744499.
- [J27] D. Piga, S. FORMENTIN, A. Bemporad  
*Direct data-driven control of constrained linear systems.*  
IEEE Transactions on Control Systems Technology. Accepted. DOI: 10.1109/TCST.2017.2702118.
- [J26] S. FORMENTIN, S. Garatti, G. Rallo, S.M. Savaresi  
*Robust direct data-driven controller tuning with an application to vehicle stability control.*  
International Journal of Robust and Nonlinear Control. Accepted. DOI: 10.1002/rnc.3782.
- [J25] J. Guanetti, S. FORMENTIN, M. Corno, S.M. Savaresi  
*Optimal energy management in series hybrid bicycles.*  
Automatica, vol. 81, pages 96-106, July 2017.
- [J24] S. FORMENTIN, F. Dabbene, R. Tempo, L. Zaccarian, S.M. Savaresi  
*Robust linear static anti-windup with probabilistic certificates.*  
IEEE Transactions on Automatic Control, vol. 62, no. 4, pages 1575–1589, April 2017 (**Best Young Author Journal Paper Award of the Italian Chapter of the IEEE CSS**).
- [J23] J. Guanetti, S. FORMENTIN, S.M. Savaresi  
*Energy management for an electric vehicle with a rental range extender: a least-costly approach.*  
IEEE Transactions on Intelligent Transportation Systems, vol. 17, no. 11, pages 3022–3034, November 2016.
- [J22] M. Ermidoro, A.L. Cologni, S. FORMENTIN, F. Previdi  
*Fixed-order gain-scheduling control of overhead bridge cranes.*  
IFAC Mechatronics, vol. 39, pages 237–247, November 2016.
- [J21] C. Novara, S. FORMENTIN, S. M. Savaresi, M. Milanese  
*Data-driven design of two degree-of-freedom nonlinear controllers: the  $D^2$ -IBC approach.*  
Automatica, vol. 72, pages 19–27, October 2016.
- [J20] F. Todeschini, S. FORMENTIN, G. Panzani, M. Corno, S. M. Savaresi, L. Zaccarian  
*Nonlinear pressure control for BBW systems via dead zone and anti-windup compensation.*  
IEEE Transactions on Control Systems Technology, vol. 24, no. 4, pages 1419–1431, July 2016.
- [J19] S. FORMENTIN, J. Guanetti, S. M. Savaresi  
*Least costly energy management for series hybrid electric vehicles.*  
Control Engineering Practice, vol. 48, pages 37–51, March 2016.
- [J18] M. Corno, S. FORMENTIN, S. M. Savaresi  
*Data-Driven online speed optimization in autonomous sailboats.*  
IEEE Transactions on Intelligent Transportation Systems, vol. 17, no. 3, pages 762–771, March 2016.
- [J17] S. FORMENTIN, D. Piga, R. Tóth, S. M. Savaresi  
*Direct learning of LPV controllers from data.*  
Automatica, vol. 65, no. 1, pages 98–110, March 2016.
- [J16] S. FORMENTIN, C. Novara, S. M. Savaresi, M. Milanese  
*Active braking control system design: the  $D^2$ -IBC approach.*  
IEEE/ASME Transactions on Mechatronics, vol. 20, no. 4, pages 1573–1584, August 2015.

- [J15] C. Benatzky, S. Stadlbauer, S. FORMENTIN, A. Schilling and D. Alberer  
*Indicated Pressure-based Data Driven Diesel Engine  $NO_x$  Modeling.*  
International Journal of Engine Research, vol. 15, no. 8, pages 934–943, December 2014.
- [J14] S. FORMENTIN, K. van Heusden, A. Karimi  
*A comparison of model-based and data-driven controller tuning.*  
International Journal of Adaptive Control and Signal Processing, vol. 28, no. 10, pages 882–897, October 2014.
- [J13] S. FORMENTIN, A. L. Cologni, F. Previdi, S. M. Savaresi  
*A data-driven approach to control of batch processes with an application to a gravimetric blender.*  
IEEE Transactions on Industrial Electronics, vol. 61, no. 11, pages 6383–6390, November 2014.
- [J12] A. G. Bianchessi, G. Cugola, S. FORMENTIN, A. Morzenti, C. Ongini, E. Panigati, M. Rossi, S. M. Savaresi, F. Schreiber, L. Tanca, E. Vannutelli Depoli  
*Green Move: a platform for highly configurable, heterogeneous electric vehicle sharing.*  
IEEE Intelligent Transportation Systems Magazine. vol. 6, no. 3, pages 96–108, October 2014.
- [J11] T. E. Passenbrunner, S. FORMENTIN, S. M. Savaresi, L. Del Re  
*Direct multivariable controller tuning for internal combustion engine test benches.*  
Control Engineering Practice, vol. 29, pages 115–122, August 2014.
- [J10] S. FORMENTIN, A. Karimi  
*Enhancing statistical performance of data-driven controller tuning via  $L_2$ -regularization.*  
Automatica, vol. 50, no. 5, pages 1514–1520, May 2014.
- [J9] S. FORMENTIN, M. Corno, D. Alberer, C. Benatzky, S. M. Savaresi  
 *$NO_x$ -estimation in Diesel engines via in-cylinder pressure measurement.*  
IEEE Transactions on Control Systems Technology. vol. 22, no. 1, pages 396 – 403, January 2014.
- [J8] S. FORMENTIN, D. Berretta, N. Urbano, I. Boniolo, P. De Filippi, S. M. Savaresi  
*A parking assistance system for small-scale boats.*  
IEEE/ASME Transactions on Mechatronics. vol. 18, no. 6, pages 1844 – 1849, December 2013.
- [J7] S. FORMENTIN, A. Karimi  
*A data-driven approach to mixed-sensitivity control with application to an active suspension system.*  
IEEE Transactions on Industrial Informatics. vol. 9, no. 4, pages 2293 – 2300, November 2013.
- [J6] S. FORMENTIN, A. Karimi, S. M. Savaresi  
*Optimal input design for direct data-driven tuning of model-reference controllers.*  
Automatica, vol. 49, no. 6, pages 1874 – 1882, June 2013.
- [J5] S. Bottelli, H. Waschl, S. M. Savaresi, L. Del Re, S. FORMENTIN  
*Data-driven estimation of exhaust manifold pressure by use of in-cylinder pressure information.*  
SAE International Journal of Engines, vol. 6, no. 1, pages 659 – 668, May 2013.
- [J4] S. FORMENTIN, P. De Filippi, M. Corno, M. Tanelli, S. M. Savaresi  
*Data-driven design of braking control systems.*  
IEEE Transactions on Control Systems Technology, vol. 21, no. 1, pages 186 – 193, January 2013.
- [J3] S. Stadlbauer, D. Alberer, M. Hirsch, S. FORMENTIN, C. Benatzky, L. Del Re  
*Evaluation of virtual  $NO_x$  sensor models for off road heavy duty Diesel engines.*  
SAE International Journal of Commercial Vehicles, vol. 5, no. 1, pages 128 – 140, July 2012.
- [J2] S. FORMENTIN, S. M. Savaresi, L. Del Re  
*Noniterative direct data-driven tuning of multivariable controllers: theory and application.*  
IET Control Theory and Applications, vol. 6, no. 9, pages 1250 – 1257, June 2012.

- [J1] S. FORMENTIN, M. Corno, S. M. Savaresi, L. Del Re  
*Direct data-driven control of linear time-delay systems.*  
 Asian Journal of Control, vol. 14, no. 3, pages 652 – 663, May 2012.

*Submitted*

- [JS3] G. Rallo, S. FORMENTIN, M. Corno, S.M. Savaresi  
*Real-time cycling cadence estimation via wheel speed measurement.*  
 IEEE/ASME Transactions on Mechatronics.
- [JS2] G. Rallo, S. FORMENTIN, S.M. Savaresi  
*On-line model-based wheel speed filtering for disturbance rejection with application to cadence estimation in bicycles.*  
 IFAC Mechatronics.
- [JS1] S. FORMENTIN, O. Galluppi, C. Novara, S.M. Savaresi  
*Multivariable  $D^2$ -IBC and application to vehicle stability control.*  
 IEEE/ASME Transactions on Mechatronics.

### Book Chapters

- [B6] S. FORMENTIN, C. Ongini, S.M. Savaresi  
*A smartphone-based energy-oriented driving assistance system.*  
 In: “Electric Vehicle Sharing Services for Smarter Cities”, D.F. Bignami, A. Colorni Vitale, A. Lué, R. Nocerino, M. Rossi, S.M. Savaresi ed., Springer, 2017.
- [B5] S. FORMENTIN, A.G. Bianchessi, S.M. Savaresi  
*Automatic fleet balancing in one-way VSSs via closed-loop dynamic pricing.*  
 In: “Electric Vehicle Sharing Services for Smarter Cities”, D.F. Bignami, A. Colorni Vitale, A. Lué, R. Nocerino, M. Rossi, S.M. Savaresi ed., Springer, 2017.
- [B4] A.G. Bianchessi, G. Cugola, S. FORMENTIN, A. Morzenti, C. Ongini, E. Panigati, M. Rossi, F.A. Schreiber, S.M. Savaresi, L. Tanca, E.G. Vannutelli Depoli  
*Architecture of the Green Move System.*  
 In: “Electric Vehicle Sharing Services for Smarter Cities”, D.F. Bignami, A. Colorni Vitale, A. Lué, R. Nocerino, M. Rossi, S.M. Savaresi ed., Springer, 2017.
- [B3] S. FORMENTIN, G. Panzani, S. M. Savaresi  
*Virtual Reference Feedback Tuning (VRFT) for LPV systems: application to automotive control*  
 In: “Robust and LPV methods : theory and applications to vehicle dynamics”, O. Sename, P. Gaspar and J. Bokor ed., Lecture Notes in Control and Information Sciences, Vol. 437, Springer. 2013.
- [B2] M. Hirsch, D. Alberer, L. Del Re, S. FORMENTIN, S.M. Savaresi  
*Direct and indirect methods for DoE of automotive systems.*  
 In: “Design of Experiments (DoE) in Engine Development: Innovative Development Methods for Vehicle Engines”, Karsten Ropke ed., Expert-Verlag, 2011.
- [B1] S. FORMENTIN, S. M. Savaresi  
*An Overview on System-Identification Problems in Vehicle Chassis Control*  
 In: “Identification for Automotive Systems”, D. Alberer, H. Hjalmarsson and L. Del Re ed., Springer-Verlag, 2011.

**International Conferences***Published/accepted*

- [C62] G.Rallo, S. FORMENTIN, C. Rojas, T. Oomen, S.M. Savaresi  
*Data-driven  $\mathcal{H}_\infty$ -norm estimation via expert advice.*  
56th IEEE Conference on Decision and Control, Melbourne, Australia, 2017. Accepted.
- [C61] S. FORMENTIN, S. Garatti, M.C. Campi, S.M. Savaresi  
*Tuning regularization via scenario optimization.*  
56th IEEE Conference on Decision and Control, Melbourne, Australia, 2017. Accepted.
- [C60] S. Sabatini, S. FORMENTIN, G. Panzani, J. de-J. Lozoya Santos, S.M. Savaresi  
*Motorcycle tire rolling radius estimation for TPMS applications via GPS sensing.*  
IEEE Conference on Control Technology and Applications, Kohala Coast, Hawaii, USA, 2017, pages 1892–1897.
- [C59] M. Mazzoleni, G. Maroni, Y. Maccarana, S. FORMENTIN, F. Previdi  
*Fault detection in airliner electro-mechanical actuators via hybrid particle filtering.*  
20th IFAC World Congress, Toulouse, France, 2017, pages 2915–2920.
- [C58] P. Kergus, C. Poussot-Vassal, F. Demourant, S. FORMENTIN  
*Frequency domain data-driven control design in the Loewner framework.*  
20th IFAC World Congress, Toulouse, France, 2017, pages 2131–2136.
- [C57] M. Mazzoleni, S. FORMENTIN, F. Previdi, S. M. Savaresi  
*Control-oriented modeling of SKU-level demand in retail food market.*  
20th IFAC World Congress, Toulouse, France, 2017, pages 13545–13550.
- [C56] O. Galluppi, S. FORMENTIN, C. Novara, S. M. Savaresi  
*Nonlinear stability control of autonomous vehicles: a MIMO  $D^2$ -IBC solution.*  
20th IFAC World Congress, Toulouse, France, 2017, pages 3754–3759.
- [C55] G. Rallo, S. FORMENTIN, M. Corno, S. M. Savaresi  
*Real-time pedaling rate estimation via wheel speed filtering.*  
20th IFAC World Congress, Toulouse, France, 2017, pages 6184–6189 (**Best student paper award and best interactive paper award, finalist**).
- [C54] O. Galluppi, S. FORMENTIN, S. M. Savaresi  
*A vehicle-user matching tool to encourage electric mobility.*  
IEEE Intelligent Vehicles Symposium, Redondo Beach (CA), USA, 2017 pages 1625–1630.
- [C53] M. Parigi Polverini, S. FORMENTIN, L. Anh Dao, P. Rocco  
*Data-Driven Design of Implicit Force Control for Industrial Robots.*  
IEEE International Conference on Robotics and Automation, Marina Bay Sands, Singapore, 2017, pages 2322–2327 (**Best student paper award, finalist**).
- [C52] A.L. Cologni, M. Ermidoro, S. FORMENTIN, F. Previdi  
*Anti-sway fixed-order control of bridge cranes with varying rope length.*  
IEEE International Conference on Mechatronics, Latrobe, Australia, 2017, pages 56–61.
- [C51] G. Rallo, S. FORMENTIN, S. Garatti, S. M. Savaresi  
*Vehicle stability control via VRFT with probabilistic robustness guarantees.*  
55th IEEE Conference on Decision and Control, Las Vegas, NV, USA, 2016, pages 7165–7170.
- [C50] G. Rallo, S. FORMENTIN, S. M. Savaresi  
*On data-driven control design for non-minimum-phase plants: a comparative view.*  
55th IEEE Conference on Decision and Control, Las Vegas, NV, USA, 2016, pages 7159–7164.

- [C49] S. FORMENTIN, L. Luini, C. Capsoni, R. Nebuloni, D. Liberati  
*Modeling rain fields for earth space propagation applications by an autoregressive modeling approach.*  
8th Advanced Satellite Multimedia Systems Conference and 14th Signal Processing for Space Communications Workshop, Palma de Mallorca, Spain, 2016, pages 1–4.
- [C48] D. Invernizzi, P. Panizza, F. Riccardi, S. FORMENTIN, M. Lovera  
*Data-driven attitude control law of a variable-pitch quadrotor: a comparison study.*  
20th IFAC Symposium on Automatic Control in Aerospace (ACA), Sherbrooke, Quebec, Canada, 2016, pages 236–241.
- [C47] G. Rallo, S. FORMENTIN, A. Chiuso, S. M. Savaresi  
*Virtual Reference Feedback Tuning with bayesian regularization.*  
European Control Conference (ECC), Aalborg, Denmark, 2016, pages 507–512.
- [C46] A. Lucchetti, C. Ongini, S. FORMENTIN, S. M. Savaresi, L. Del Re  
*Automatic recognition of driving scenarios for ADAS design.*  
8th IFAC International Symposium on Advances in Automotive Control, Norrköping, Sweden, 2016, pages 109–114.
- [C45] P. Panizza, D. Invernizzi, F. Riccardi, S. FORMENTIN, M. Lovera  
*Data-driven attitude control law design for a variable-pitch quadrotor.*  
IEEE American Control Conference (ACC), Boston (MA), USA, 2016, pages 4434–4439.
- [C44] C. Novara, S. FORMENTIN, S. M. Savaresi, M. Milanese  
*A data-driven approach to nonlinear braking control.*  
54th IEEE Conference on Decision and Control, Osaka, Japan, 2015, pages 1453–1458.
- [C43] J. Guanetti, S. FORMENTIN, S. M. Savaresi  
*Least costly energy management for electric vehicles with plug-in range extenders.*  
54th IEEE Conference on Decision and Control, Osaka, Japan, 2015, pages 638–643.
- [C42] J. Guanetti, S. FORMENTIN, M. Corno, S. M. Savaresi  
*Optimal energy management in series hybrid electric bicycles.*  
54th IEEE Conference on Decision and Control, Osaka, Japan, 2015, pages 869–874.
- [C41] S. FORMENTIN, D. Piga, R. Tóth, S. M. Savaresi  
*Nonparametric LPV data-driven control.*  
1st IFAC Symposium on Linear Parameter Varying Systems (LPVS), Grenoble, France, 2015, pages 146–151.
- [C40] S. FORMENTIN, A. Bisoffi, T. Oomen  
*Asymptotically exact direct data-driven multivariable controller tuning.*  
IFAC Symposium on System Identification, Beijing, China, 2015, pages 1349–1354.
- [C39] S. FORMENTIN, C. Novara, S. M. Savaresi, M. Milanese  
*Data-driven inversion-based control of nonlinear systems.*  
IFAC Symposium on System Identification, Beijing, China, 2015, pages 1343–1348.
- [C38] S. FORMENTIN, A.G. Bianchessi, S.M. Savaresi  
*On the prediction of future vehicle locations in free-floating car sharing systems.*  
IEEE Intelligent Vehicles Symposium, COEX, Seoul, Korea, 2015, pages 1006–1011.
- [C37] A. Brankovic, D. Berretta, S. FORMENTIN, M. Corno, S.M. Savaresi  
*Modeling and speed limitation control of an electric kick scooter.*  
European Control Conference (ECC), Linz, Austria, 2015, pages 697–702.
- [C36] S. FORMENTIN, F. Dabbene, R. Tempo, L. Zaccarian, S.M. Savaresi  
*Scenario optimization with certificates and applications to anti-windup design.*  
53rd IEEE Conference on Decision and Control, Los Angeles (CA), USA, 2014, pages 2810 - 2815.

- [C35] M. Mazzoleni, S. FORMENTIN, F. Previdi, S.M. Savaresi  
*Fault Detection via modified Principal Direction Divisive Partitioning and application to aerospace electro-mechanical actuators.*  
53rd IEEE Conference on Decision and Control, Los Angeles (CA), USA, 2014, pages 5770 - 5775.
- [C34] S. FORMENTIN, M.C. Campi, S.M. Savaresi  
*Virtual Reference Feedback Tuning for industrial PID controllers.*  
19th IFAC World Congress, Cape Town, South Africa, 2014, pages 11275 - 11280.
- [C33] S. FORMENTIN, S. Bittanti  
*An insight into noise covariance estimation for Kalman filter design.*  
19th IFAC World Congress, Cape Town, South Africa, 2014, pages 2358 - 2363.
- [C32] J. Guanetti, S. FORMENTIN, S.M. Savaresi  
*Total cost minimization for next generation hybrid electric vehicles.*  
19th IFAC World Congress, Cape Town, South Africa, 2014, pages 4819 - 4824.
- [C31] S. FORMENTIN, A.L. Cologni, F. Previdi, S.M. Savaresi  
*On batch process control using feature extraction with application to a gravimetric blender.*  
IEEE American Control Conference (ACC), Portland (OR), USA, 2014, pages 1138 - 1143.
- [C30] F. Todeschini, S. FORMENTIN, G. Panzani, M. Corno, S.M. Savaresi, L. Zaccarian  
*Deadzone compensation and anti-windup design for brake-by-wire systems.*  
IEEE American Control Conference (ACC), Portland (OR), USA, 2014, pages 572 - 577.
- [C29] M. Ermidoro, S. FORMENTIN, A. Cologni, F. Previdi, S.M. Savaresi  
*On time-optimal anti-sway controller design for bridge cranes.*  
IEEE American Control Conference (ACC), Portland (OR), USA, 2014, pages 2809 - 2814.
- [C28] S. FORMENTIN, D. Piga, R. Tóth, S. M. Savaresi  
*Direct data-driven control of linear parameter-varying systems.*  
52nd IEEE Conference on Decision and Control, Firenze, Italy, 2013, pages 4110 - 4115.
- [C27] S. FORMENTIN, S. M. Savaresi, L. Zaccarian, F. Dabbene  
*Randomized analysis and synthesis of robust linear static anti-windup.*  
52nd IEEE Conference on Decision and Control, Firenze, Italy, 2013, pages 4498 - 4503.
- [C26] A. G. Bianchessi, S. FORMENTIN, S. M. Savaresi  
*Active Fleet Balancing in Vehicle Sharing Systems via Feedback Dynamic Pricing.*  
16th IEEE Conference on Intelligent Transportation Systems (ITSC), The Hague, The Netherlands, 2013, pages 1619 - 1624.
- [C25] A. Cologni, S. FORMENTIN, F. Previdi, S. M. Savaresi  
*Polymer flow control in continuous gravimetric blenders.*  
ASME Dynamic Systems and Control Conference (DSCC), Stanford, Palo Alto (CA), USA, 2013, pages 1837 - 1844.
- [C24] F. Riccardi, M. F. Haydar, S. FORMENTIN, M. Lovera  
*Control of variable-pitch quadrotors.*  
19th IFAC Symposium on Automatic Control in Aerospace, Würzburg, Germany, 2013, pages 206 - 211.
- [C23] S. FORMENTIN, K. van Heusden, A. Karimi  
*Model-based and data-driven model-reference control: a comparative analysis.*  
European Control Conference (ECC), Zurich, Switzerland, 2013, pages 1410 - 1415.
- [C22] D. Berretta, N. Urbano, S. FORMENTIN, I. Boniolo, P. De Filippi, S. M. Savaresi  
*Modeling, identification and control of a Boat Parking Assistance system.*  
European Control Conference (ECC), Zurich, Switzerland, 2013, pages 3012 - 3017.



- [C21] S. FORMENTIN, A. Karimi  
*Direct data-driven design of sparse controllers.*  
IEEE American Control Conference (ACC), Washington DC, USA, 2013, pages 3099 - 3104.
- [C20] S. FORMENTIN, A. Karimi  
*On  $L_2$ -regularization for Virtual Reference Feedback Tuning.*  
IEEE American Control Conference (ACC), Washington DC, USA, 2013, pages 3105 - 3110.
- [C19] T. E. Passenbrunner, S. FORMENTIN, S. M. Savaresi and L. del Re  
*Direct data-driven control of internal combustion engine test benches using closed-loop experiments.*  
51st IEEE Conference on Decision and Control, Maui, Hawaii, USA, 2012, pages 3765 - 3770.
- [C18] G. Panzani, S. FORMENTIN, S.M. Savaresi  
*Active motorcycle braking via direct data-driven load transfer scheduling.*  
IFAC Symposium on System Identification, Brussels, Belgium, 2012, pages 1257 - 1262.
- [C17] S. FORMENTIN, A. Karimi, S.M. Savaresi  
*On input design for direct data-driven controller tuning.*  
IFAC Symposium on System Identification, Brussels, Belgium, 2012, pages 1466 - 1471.
- [C16] S. FORMENTIN, D. Alberer, M. Corno, L. Del Re, S.M. Savaresi  
 *$NO_x$  estimation via in-cylinder pressure feature extraction.*  
IFAC Symposium on System Identification, Brussels, Belgium, 2012, pages 739 - 744.
- [C15] G. Alli, S. FORMENTIN, S.M. Savaresi  
*A range-bounding strategy for electric scooters.*  
IEEE International Electric Vehicle Conference, Greenville, South Carolina USA, 2012, pages 1 - 7.
- [C14] S. FORMENTIN, M. Hirsch, S.M. Savaresi, L. Del Re  
*Direct data-driven control of a Diesel engine airpath.*  
IEEE American Control Conference, Montreal, Canada, 2012, pages 4198 - 4203.
- [C13] S. FORMENTIN, I. Boniolo, P. Lisanti, C Spelta, S.M. Savaresi  
*Fault detection in roll angle estimation for two-wheeled vehicles.*  
13th IFAC Symposium on Control in Transportation Systems, Sofia, Bulgaria, 2012, pages 54 - 59.
- [C12] S. FORMENTIN, S.M. Savaresi  
*Virtual Reference Feedback Tuning for linear parameter-varying systems.*  
18th IFAC World Congress, Milano (Italy), 2011, pages 10219 - 10224.
- [C11] S. FORMENTIN, A.Karimi, S.M. Savaresi  
*Direct data-driven  $\mathcal{H}_2 - \mathcal{H}_\infty$  loop-shaping.*  
18th IFAC World Congress, Milano (Italy), 2011, pages 11423 - 11428.
- [C10] S. FORMENTIN, D. Belloli, A. Cologni, F. Previdi, S.M. Savaresi  
*Fast tuning of cascade control systems.*  
18th IFAC World Congress, Milano (Italy), 2011, pages 10243 - 10248.
- [C9] P. De Filippi, S. FORMENTIN, S.M. Savaresi  
*A comparison between model-based and data-driven design of an active stability control system for two-wheeled vehicles.*  
ASME Dynamic Systems and Control Conference, Arlington, VA, USA, 2011, pages 823 - 830.
- [C8] S. FORMENTIN, M. Lovera  
*Flatness-based control of a quadrotor helicopter via feed-forward linearization.*  
50th IEEE Conference on Decision and Control, Orlando (FL), USA, 2011, pages 6171 - 6176.

- [C7] S. FORMENTIN, S.M. Savaresi  
*Noniterative data-driven design of multivariable controllers.*  
50th IEEE Conference on Decision and Control, Orlando (FL), USA, 2011, pages 5106 - 5111.
- [C6] S. FORMENTIN, P. De Filippi, M. Tanelli, S.M. Savaresi  
*Model-free control for active braking systems in sport motorcycles.*  
8th IFAC Symposium on Nonlinear Control Systems, Bologna (Italy) 2010, pages 873 - 878.
- [C5] G. Alli, S. FORMENTIN, S.M. Savaresi  
*On the suitability of EPACs in urban use.*  
IFAC Mechatronics, Boston (MA), USA, 2010, pages 277 - 284.
- [C4] S. FORMENTIN, G. Alli, S.M. Savaresi, F. Castelli Dezza  
*Analysis and design of hardware architectures and control algorithms for an EPAC.*  
ASME Dynamic Systems and Control Conference, Boston (MA), USA, 2010, pages 481 - 488.
- [C3] S. FORMENTIN, P. De Filippi, S.M. Savaresi  
*Optimal design of experiment for the identification of throttle-to-slip dynamics in two-wheeled vehicles.*  
IEEE Multi-Conference on Systems and Control, Yokohama, Japan, 2010, pages 142 - 147.
- [C2] S. FORMENTIN, S.M. Savaresi, M. Hirsch, L. Del Re  
*On the experimental protocol in Virtual Reference Feedback Tuning.*  
49th IEEE Conference on Decision and Control, Atlanta (GA), USA, 2010, pages 5554 - 5559.
- [C1] S. FORMENTIN, M. Corno, S.M. Savaresi, L. Del Re  
*Virtual Reference Feedback Tuning of Internal Model Controllers.*  
49th IEEE Conference on Decision and Control, Atlanta (GA), USA, 2010, pages 5542 - 5547.

*Submitted*

- [CS4] D. Nava, S. FORMENTIN, S.M. Savaresi  
*Online power meter calibration for accurate cyclist power control.*  
European Control Conference (ECC), Limassol, Cyprus, 2018.
- [CS3] S. FORMENTIN, F. Previdi, G. Maroni, C. Cantaro  
*Stock trading via feedback control: an extremum seeking approach.*  
European Control Conference (ECC), Limassol, Cyprus, 2018.
- [CS2] M. Mazzoleni, S. FORMENTIN, M. Scandella, F. Previdi  
*Semi-supervised learning of dynamical systems: a preliminary study.*  
European Control Conference (ECC), Limassol, Cyprus, 2018.
- [CS1] P. Kergus, S. FORMENTIN, C. Poussot-Vassal, F. Demourant  
*Data-driven control design in the Loewner framework: dealing with stability and noise.*  
European Control Conference (ECC), Limassol, Cyprus, 2018.

**Patents**

- [P4] S.M. Savaresi, G. Favero, S. FORMENTIN, D. Nava  
*Dispositivo e metodo per la determinazione della potenza impressa sui pedali di una bicicletta.*  
Applicant: Favero Electronics S.r.l. and Politecnico di Milano  
Patent number (Italian Patent): 102017000043114. April 20, 2017.
- [P3] S. FORMENTIN, M. Corno, S.M. Savaresi, G. Rallo  
*Dispositivo per la determinazione di una grandezza cinematica di una bicicletta e della cadenza di pedalata esercitata sui pedali di detta bicicletta.*  
Applicant: E-Novia S.r.l. and Politecnico di Milano  
Patent number (Italian Patent): 102015000076011. November 24, 2015.

- [P2] S.M. Savaresi, S. FORMENTIN, A.G. Bianchessi  
*Metodo per la predizione della distanza utente-veicolo in servizi car-sharing on-demand.*  
Applicant: Politecnico di Milano  
Patent number (Italian Patent): VI2014A000187. July 14th, 2014.  
European extension: July 7, 2015.
- [P1] S.M. Savaresi, M. Corno, S. FORMENTIN, L. Fabbri  
*Sistema e metodo di controllo della trazione in un veicolo a due ruote.*  
Applicant: Piaggio Group S.p.A. and Politecnico di Milano  
Patent number (Italian Patent): MI2009A0010134. June 9, 2009.

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