Luigi Iannelli
Curriculum Vitae et studiorum
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Personal data

Assistant Professor of Automatic Control at the University of Sannio in Benevento, Italy

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He was born in Benevento (Italy) on April 5, 1975

Languages: Italian, native; English, fluent.

IEEE (Institute of Electrical and Electronic Engineers) Senior Member.

IEEE Control Systems Society Member.

IEEE Circuits and Systems Society Member.

SIAM (Society for Industrial and Applied Mathematics) Member.

SICC (Italian Society for Chaos and Complexity) Member.

Education

February 12, 2003

Ph.D. degree in Information Engineering (curriculum in Automatic Control) at the University of Napoli Federico II (Italy). Thesis title:"Dithering for smoothing relay feedback systems: an averaging approach"; advisors: Prof. Franco Garofalo and Prof. Francesco Vasca.

June 30, 1999

"Laurea" degree in Computer Engineering obtained from the University of Sannio in Benevento (Italy) with full marks ("summa cum laude"). Thesis title: "A new technique for the dynamic compensation of SAR converters nonlinearities"; advisors: Prof. Pasquale Daponte and Prof. Pasquale Arpaia.

Academic appointments

December 2004 –

Assistant Professor (Ricercatore Universitario) at the University of Sannio in Benevento, Italy, Department of Engineering.

July 2003 – December 2004

PostDoc position at the Department of Computer and Systems Engineering, University of Napoli Federico II.

March – May 2003

Guest researcher and teacher at the Royal Institute of Technology (KTH), Stockholm, Sweden.

January – July 2002

Visiting student at the Royal Institute of Technology (KTH), Stockholm, Sweden.

Professional and scientific appointments

January 2014

Associate Professorship qualification obtained from the Italian Ministry of University and Research.

March 2012

IEEE Senior Membership obtained from Institute of Electrical and Electronics Engineers.

January 2005

Co-founder of the company Mosaico Monitoraggio Integrato s.r.l., a small enterprise involved in industrial automation.

February 2000

Qualification as Italian professional engineer obtained from the University of Napoli Federico II, Italy.

Research areas

Distributed control and optimization over networks; nonsmoooth systems; piecewise quadratic stability; smart grids; power electronics; automotive control.

Other skills and expertise

Programming languages: C, Matlab/Simulink, Python. LaTeX. Distributed version control systems: Mercurial, Git.

Research projects and collaborations

Participation and operative responsibility within the FP7 european research project ICT-2011-8, project number 318184, called **I3RES, ICT-based intelligent management of Integrated RES for the smart grid optimal operation**. November 2012 – October 2015. Project amount: 429 kEuros (only related to University of Sannio activities).

Participation and scientific co-responsibility of the research collaboration between FIAT PowerTrain Technologies S.p.A. and the Engineering Department of the University of Sannio. Title: **"TMS controls: tranmsission modeling for HIL simulation"**. Project amount: 40 kEuros. May 2012 – December 2012.

Participation and operative responsibility within the research project SFERE co-funded by Ministero per l'Università e la Ricerca, PON 2007-2013. Title: **"Railway systems: eco-sustainability and energetic efficiency"**. January 2011 – . Project amount: 858 kEuros (only related to University of Sannio activities).

Participation and operative responsibility within the research collaboration between AnsaldoBreda S.p.A. and the Engineering Department of University of Sannio. Title: **"Simulation platform aimed to the evaluation of efficiency and consumption of railway vehicles"**. May 2011 – July 2012. Project amount: 38.5 kEuros (only related to University of Sannio activities).

Participation and operative responsibility within the research project POSTRAIN co-funded by Ministero per lo Sviluppo Economico, IPI2015. Topic: railway vehicles. March 2009 -July 2010. Project amount: 210 kEuros (only related to University of Sannio activities).

Participation and operative responsibility within the research project VIRNET-MEF co-funded by Regione Campania, POR 2000-2006, 3.17 activity. Title: **"VIRtual NETwork for Marketing and Loyalty Programs"**. August 2008 – March 2010. Project amount: 46 kEuros (only related to University of Sannio activities).

Participation and operative responsibility within the research collaboration between ELASIS S.c.p.A. and the Engineering Department of the University of Sannio. Title: **"Transmissibility characteristics of the dry clytch, learning algorithms and pattern tests for validation in a HIL environment"**. Project amount: 35 kEuros. May 2008 – December 2008.

Scientific responsible of the research collaboration between Ansaldo Sistemi Industriali S.p.A and the Engineering Department of University of Sannio. Title: **"Simulation platform for analysis and real-time hardware-in-the-loop validation of control systems for power electronics converters"**. Project amount: 33 kEuros. June 2007 - March 2008.

Participation and operative responsibility within the research collaboration between Ansaldo Breda S.p.A and the Engineering Department of the University of Sannio. Title: **"Real-time hardware-in-the-loop simulation for railway traction control systems"**. November 2006 – February 2008.

Participation and scientific co-responsibility of the research collaboration between ELASIS S.c.p.A. and the Engineering Department of the University of Sannio. Title: **"Electro-hydraulic actuation system for dry clutches"**. Project amount: 30 kEuros. May 2006 – March 2007.

Scientific responsible of the research collaboration between CSM S.p.A and the Engineering Department of University of Sannio. Title: **"Dynamic model for the estimation of the actuation capacity of electric motors for a stretch reducing mill plant"**. Project amount: 45 kEuros. November 2005 – March 2006.

Participation and operative responsibility within the research collaboration between CSM S.p.A and the Engineering Department of the University of Sannio. Title: **"Simulation models and simulators for complex production processes in the steel-making field"**. May 2004 – July 2007.

Participation at the FP5 European Research Project IST2001-37172 called **SICONOS, SImulation and COntrol of NOnsmooth Systems**. September 2002 – August 2006. Within the project he actively participated at the coordinating and research spending some periods at the European research partners.

Research visits

October 2015 – today, *Univeristy of Groningen*, Groningen, The Netherlands, Prof. Kanat Camlibel.

February 2014, *California Institute of Technology*, Pasadena CA, USA. Prof. Steven Low.

April 2013, *Doğuş University*, Istanbul, Turkey. Prof. Cem Göknar.

February 2013, *INRIA*, Grenoble, France. Dr. Vincent Acary and Dr. Bernard Brogliato.

October 2005, *Royal Institute of Technology*, Stockholm, Sweden. Prof. Karl Johansson.

Invited talks

June 13th, 2015 "IoT technologies: new frontiers for scientific research", Make & Share event, Benevento, Italy.

May 16th, 2014 "Modeling and control of storage equipped electrical grids", (in teleconference) Universidad Industrial de Santander, Bucaramanga, Colombia.

September 13th, 2013 "Computation of oscillations through a complementarity approach", 8th SICC International School on Bifurcations in Piecewise Smooth Systems: Perspectives, Methodologies and Open Problems, Urbino, Italy.

April 17th, 2013 "Linear complementarity models for switched electronic systems", Doğuş University, Istanbul, Turkey.

February 7th, 2013 "Linear complementarity models for switched electronic systems", INRIA, Grenoble, France.

November 30th, 2006 "Complementarity and passivity for piecewise-linear feedback systems", Università degli Studi di Napoli Federico II, Napoli, Italy.

November 17th, 2005 "Cooperative control of multi-agent systems", KTH, Stockholm, Sweden.

October 24th, 2005 "Dynamic complementarity systems for modelling power converters", Università degli Studi del Sannio di Benevento, Italy.

January 7th, 2005 "Simulation of a voltage controlled buck converter", INRIA, Grenoble, France.

April 26th, 2004 "Modeling and control for automated manual transmissions with dry clutch", Università degli Studi di Palermo, Palermo, Italy.

May 24th, 2002 "Pricing techniques for network congestion control", KTH, Stockholm, Sweden.

March 22nd, 2002 "Network congestion control: pricing techniques", KTH, Stockholm, Sweden.

January 17th, 2002 "Automatic control of dry clutch engagement", KTH, Stockholm, Sweden.

Conference activity

Programme Committees

- Member of the Program Commitee of the IEEE First International Conference on Control, Measurement and Instrumentation, January 8–10, 2016.
- Member of the Program Committe of the IEEE Conference on Automation Science and Engineering, August 23–26, 2008.

Organizing Committee

- Member of the Organizing Committee of the Informal Workshop on Automotive Clutch Control, University of Sannio in Benevento, May 2006.

Local Organizing Committee

- Member of the Local Organizing Committe of the Annual National Meeting of the SIDRA (Italian Society of Automatic Control), AUTOMATICA.IT 2012, University of Sannio in Benevento, September 12 – 14, 2012.
- Member of the Local Organizing Committee of the International Workshop on the Future of Control in Transportation Systems, University of Sannio in Benevento, May 27 – 29, 2010.

Conferences services

- Associate editor of IEEE Conference on Decision and Control, 2015.
- Associate editor of IEEE American Control Conference, 2015, 2016.

Invited and tutorial sessions

- Organizer of the tutorial session "New Modeling and Control Challenges Inspired by Switched Electronic Systems", Mediterranean Conference on Control and Automation, June 2014, together with Prof. Francesco Vasca, University of Sannio in Benevento, Italy, and Dr. Sebastien Mariethoz, ETH Zurich, Switzerland.
- Organizer of the invited session "Switched Electronic Systems", IEEE Conference on Decision and Control, December 2009, together with Prof. Francesco Vasca, University of Sannio in Benevento, Italy.

Presented papers

- "A colored Gauss-Seidel approach for the distributed network flow problem", SIDRA (Italian Society of Automatic Control) National Meeting, Bari, September 2015.
- "An overview of averaging results with applications to power converters", IEEE Mediterranean Conference on Control and Automation, Palermo, Italy, June 2014.
- "Computation of limit cycles in Lur'e systems", American Control Conference, San Francisco, CA, USA, July 2011.
- "Computation of limit cycles and forced oscillations in discrete–time piecewise linear feedback systems through a complementarity approach", IEEE Conference on Decision and Control, Cancun, Mexico, December 2008.
- "Analysis of periodic solutions in piecewise linear feedback system via a complementarity approach", IFAC World Congress, Seoul, South Korea, June 2008.
- "Rate admission control for hard real-time task scheduling", International Conference on Hybrid Systems: Computation and Control, Pisa, Italy, April 2007.
- "Complementarity and passivity for piecewise linear feedback systems", IEEE Conference on Decision and Control, San Diego, CA, USA, December 2006.
- "Sensor fusion by using a sliding observer for an underwater breathing system", IEEE Conference on Decision and Control, Seville, Spain, December 2005.
- "Dither shape in the av- eraging of switched systems", American Control Conference, Boston, MA, USA, July 2004.
- "Effects of dither shapes in nonsmooth feedback systems: experimental results and theoretical insight", IEEE Conference on Decision and Control, Maui, HI, USA, December 2003.
- "Practical Stability and Limit Cycles of Dithered Relay Feedback Systems", European Control Conference, Cambridge, UK, September 2003.
- "Analysis of dither in relay feedback systems", IEEE Conference on Decision and Control, Las Vegas, NV, USA, December 2002.
- "Participation Factors and their Connections to Residues and Relative Gain Array", IFAC World Congress, Barcelona, Spain, July 2002.
- "Analysis of dither in relay feedback systems", CIRA (Italian Consortium of Automatic Control) National Meeting, Perugia, Italy, September 2002.
- "Smooth engagement for automotive dry clutch", IEEE Conference on Decision and Control, Orlando, FL, USA, December 2001.
- "Participation factors, residues and RGA", CIRA (Italian Consortium of Automatic Control) National Meeting, Lecce, Italy, September 2001.

Teaching activity

Academic Years: Since 2010/2011 – today

Undergraduate Course **"Automatic Control"**, (6 ECTS credits) second year of the

Laurea degree in Computer and Electronics Engineering, Department of Engineering, University of Sannio in Benevento, Italy.

Academic Year: 2010/2011
Undergraduate Course **"Modelling and Simulation"**, (4 ECTS credits) third year of the Laurea degree in Computer Engineering, Faculty of Engineering, University of Sannio in Benevento, Italy.

Academic Years: Since 2005/2006 till 2009/2010
Graduate Course **"Nonlinear Dynamics"**, (4 ECTS credits) first year of the Master degree in Automation Engineering, Faculty of Engineering, University of Sannio in Benevento, Italy.

Academic Years: Since 2004/2005 till 2009/2010
Graduate Course **"Process Control"**, (6 ECTS credits) first year of the Master degree in Automation Engineering, Faculty of Engineering, University of Sannio in Benevento, Italy.

Academic Years: 2004/2005 and 2005/2006
Undergraduate Course **"Automatic Control"**, (3 ECTS credits) second year of the Laurea degree in Energetic Engineering, Faculty of Engineering, University of Sannio in Benevento, Italy.

March-May 2003
Undergraduate course **"Automatic Control Project Course"** (12 ECTS credits) at the Royal Institute of Technology (KTH), Stockholm, Sweden, academic year 2002/2003.

Academic Years: 2001/2002 and 2002-2003
Undergraduate course **"Control Engineering"** (4 ECTS credits) at Engineering Faculty of University of Sannio in Benevento, Italy, academic year 2002/2003.

Academic Year: 2000-2001
Tutoring activity for the undergraduate course "Systems Theory" at Engineering Faculty of University of Napoli Federico II, Napoli, Italy.
Tutoring activity for the Laurea degree course "Automatic Control II" (Prof. F. Garofalo) at Engineering Faculty of University of Sannio in Benevento, Italy.

Academic Years: 1999/2000 and 2000/2001
Tutoring activity for the Laurea degree "Process Control" at Engineering Faculty of University of Napoli Federico II, Napoli, Italy.

Luigi Iannelli is also co-author of the lectures notes "Systems identification" (written in Italian language) together with Prof. Franco Garofalo and Prof. Francesco Vasca. Such lecture notes are used by students of the courses "Models identification" (University of Sannio in Benevento) and "Identification and optimal control" (University of Napoli Federico II).

PhD students supervision

2013 –
Alessio Maffei, University of Sannio in Benevento, Italy. Topic: "Distributed optimization over networks". Tutor Prof. Luigi Glielmo.

2011 – 2014
Daniela Meola, University of Sannio in Benevento, Italy. Thesis: "Modeling and Optimization of Distribution Networks: a Smart Grid Approach", July 2014. Cotutor Prof. Luigi Glielmo.

2010 – 2013

Valentina Sessa, University of Sannio in Benevento, Italy. Thesis: "Periodic oscillations in piecewise linear Lur'e systems: a complementarity approach", July 2013. Tutor Prof. Francesco Vasca.

2010 – 2013

Carmen Pedicini, University of Sannio in Benevento, Italy. Thesis: "Averaging techniques for switched systems", July 2013. Co-tutor Prof. Francesco Vasca.

2009 – 2012

Silvio Baccari, University of Sannio in Benevento, Italy. Thesis: "Photo-electro-thermal Model Predictive Control for Light Emitting Diode", July 2012. Tutor Prof. Francesco Vasca.

2008 – 2011

Gianluca Angelone, University of Sannio in Benevento, Italy. Thesis: "Steady-state Analysis for Switched Electronic Systems Through Complementarity", July 2011. Tutor Prof. Francesco Vasca.

2003 – 2007

Roberto Frasca, University of Sannio in Benevento, Italy. Thesis: "Modeling and Simulation of Switched Electrical Networks: a Complementarity Systems Approach", May 2007. Tutor Prof. Francesco Vasca.

2002 – 2006

Maria Carmela De Gennaro, University of Sannio in Benevento, Italy. Thesis: "Decentralized Formation Control for Multi-Agent Systems", May 2006. Tutor Prof. Francesco Vasca.

University service

December 2013 –

Member of the board for the Doctorate in "Information Technologies for Engineering", University of Sannio in Benevento, Italy.

February 2013 – February 2014

Member of the committee for the new department rules, Department of Engineering, University of Sannio in Benevento, Italy.

November 2008 – December 2009

Member of the examining committee for the qualification as Italian professional engineer, 2nd session 2008 and 1st and 2nd session 2009, University of Sannio in Benevento, Italy.

2008 – 2013

Elected representative of assistant professors at the Engineering Faculty Board, University of Sannio in Benevento, Italy.

Scientific and editorial activities

Editorial Board

Associate Editor of the IEEE Control Systems Society Conference Editorial Board. June 2014 – today

Editor of edited books

F. Vasca, L. Iannelli, "Dynamics and Control of Switched Electronic Systems", Springer-Verlag, May 2012.

Editorial Advisory Board

F. Flammini, "Railway Safety, Reliability, and Security: Technologies and Systems Engineering", Information Science Reference, May 2012 (from November 2010 till May 2012).

PhD defense committe member

Member of the committee for the doctoral thesis of Niliana Andreina Carrero Candelas, Universitat Politècnica de Catalunya, Barcelona, July 2014.

Expert Reviewer for Funding Agencies

Reviewer for the Italian Ministry for Education, University and Research (MIUR), 2013, 2014.

International journals reviewer

- Automatica (2005 – today)
- IEEE Transactions on Automatic Control (2005, 2006, 2009 – today)
- IEEE Transactions on Circuits and Systems, Part I (2005, 2009, 2013 – today)
- IEEE Transactions on Circuits and Systems, Part II (2004, 2006, 2007, 2009)
- IEEE Transactions on Control Systems Technology (2008 – 2010, 2012 – today)
- ASME Journal of Dynamic Systems, Measurement and Control (2009)
- IEEE/ASME Transactions on Mechatronics (2009)
- Control Engineering Practice (2006, 2013 – today)

International conferences reviewer

- IEEE Conference on Decision and Control
- American Control Conference
- Mediterranean Conference on Control and Automation
- IEEE Conference on Control Applications

Chairman or co-chairman of international conference sessions

- IEEE Conference on Decision and Control, 2015
- Mediterranean Conference on Control and Automation, 2014
- IFAC World Congress, 2008
- American Control Conference, 2004

Research activities

Stability of piecewise-linear systems [IC3, IJ1, IC15, IC19, IC20]

A recent research activity has been started with the aim of investigating the stability of piecewise-linear systems by using modern computational tools that might give less conservative results with respect to classical approaches. In particular the complementarity framework (see the research line below) has been applied for deriving stability results of a class of Lur'e systems [IC19, IC20] while new computational tools based on the concept of cone-copositivity have been successfully applied to the stability analysis of piecewise-linear differential inclusions [IC19] and conewise linear systems [IJ1], also in the presence of sliding modes [IC3].

Linear complementarity systems [IB1],[BC3],[IJ2, IJ3, IJ6, IJ8, IJ9],[IC8, IC11, IC17, IC18, IC22–IC25, IC27–IC29, IC38]

Complementarity systems are dynamical systems described in the state space, where state dynamics are affected by the so-called complementarity variables, which are variables under nonnegativity and mutual orthogonality constraints. Complementarity systems have been recently proposed as a framework for modeling and analyzing discontinuous, and in general nonsmooth, dynamic systems. The research activity has been

carried on linear complementarity systems and the generalization of switched cone complementarity systems. It has been shown how complementarity models can represent and model switching electronic devices (diodes, thyristors, transistors, MOSFETs) allowing to analyze power electronics converters [BC3],[IJ9],[IC18, IC22, IC23, IC28, IC38]. Furthermore it has been shown the effectiveness of the complementarity formalism in the solving of state jumps due to ideal switches commutations in electrical networks. In particular it has been shown how such an approach allows to obtain the same solution given by classical approaches based on the principle of the charge/flux conservation [IJ8],[IC27]. One of the advantages of the complementarity formalism consists in obtaining an explicit solution in a systematic way and, so, easily implementable through an algorithm. The study has been extended to the analysis of a class of systems in the Luré form, in particular dynamic linear systems with a piecewise linear feedback. Results coming from the circuit theory have been exploited for getting a linear complementarity model preserving, whenever possible, the fundamental property of passivity [IC27] that has been proved to have an important role for well-posedness of such class of systems [IJ3].The complementarity approach has been effective for detecting in a numeric way the existence of periodic solutions in the class of piecewise linear Lur'e systems [IC17, IC24, IC25] and in a class of power electronic converters [BC3],[IJ6],[IC18, IC22, IC23]. Recent advancements, based on formulating the existence of periodic solutions as a mixed linear complementarity problem, allowed to simplify the computation and getting more accurate numeric solutions [IC11] as well as computing oscillations with unknown period [IC8]. Current activities deal with a complete modeling framework of switching electronic devices, thus extending previous results and allowing to model closed-loop controlled power converters as simple linear complementarity systems rather than more complex switched cone complementarity systems [IJ2].

Control and optimization of networks and smart grids [IC1, IC4, IC5]

Nowadays networks and cyberphyisical systems represent a class of systems that give rise to very challenging control problems. This recent research activity has been focused on the optimal management and control of smart grids where reneweable energy sources, economic issues and physical network constraints must be considered together with the aim of improving the working behavior of real power networks. To this aim a model predictive control approach has been used in order to cope with the problem [IC5]. The control strategy exploits the grid model and the forecast of renewable sources [IC4] in order to optimize the overall operating behavior.

From a more theoretical point of view, a novel algorithm for solving of the minimum cost network flow problem in a fully distributed way has been proposed [IC1]

Modeling and control of high-power LEDs [IC12],[PT1]

This research activity started with the aim of applying model based control methodologies to the control of high power LEDs for illuminating applications. In particular a photo-thermal model of the LED has been derived and a model predictive control approach has been used for regulating the luminous flux taking into account thermal and electrical constraints [IC12]. An Italian patent has been deposited [PT1].

Averaging techniques for nonlinear and discontinuous systems [IJ4], [IB1], [BC2], [IC6],[IC14], [IJ10, IJ12, IJ14], [IC7, IC9, IC16, IC33, IC39, IC41, IC44, IC46, IC47], [TH1]

The dithering technique (injection of high frequency signals) in control loops that have discontinuous nonlinearities (e.g. the relay) gives rise to interesting phenomena that

do not appear when nonlinearities are smooth. The research activity has been of a methodological type, without neglecting applicative and experimental aspects that validated theoretical results and highlighted subtleties of the analysis of interest in the application. In particular it has been shown in a rigorous way that averaging theory can be applied to a wide class of dynamic systems [IC6],[BC2], even nonsmooth, where the injected dither signal satisfies some conditions related to the waveform shape, in particular the Lipschitz condition on the amplitude distribution function [IJ12, IJ14],[IC39, IC44, IC46, IC47],[TH1]. It has been highlighted how dither signals that do not satisfy such conditions (e.g., the square wave signal) could give rise to complex phenomena when discontinuous nonlinearities are in the control loop. Such effects have been shown through experiments applying theoretical results in the power electronics converters field [IC33, IC39, IC41], [IJ10]. Recent research activity has been aimed to investigate different approaches for analyzing nonlinear systems through averaging techniques [IC16] and to surveying how such techniques have been used in control applications [IC14]. Moreover the averaging has been applied to switched systems whose dynamics is described by differential algebraic equations [IJ4],[IC7, IC9].

Optimization in dynamic games [IC2]

Some research activity has been conducted regarding multi-agents perspective in dynamic games. In particular, in [IC2] it has been investigated the problem of linear quadratic optimization for a hierarchical and multi-agent dynamic game.

Control of magnetostrictive actuators [IJ5]

A recent research activity has been started dealing with the analysis and control of magnetostrictive actuators that suffer from strong hysteretic phenomena. In [IJ5] a simple but effective two-degrees-of-freedom controller has been proposed and compared with more standard control schemes through real time experiments.

Nonlinear dynamics in power electronics converters, DC/DC type [IC6],[IB1], [IJ11, IJ15], [IC32, IC36, IC42, IC43, IC50]

During such research activity come complex behaviors have been investigated, by considering the nonlinear dynamics intrinsic into the operating principles of DC/DC power electronics converters. It has been shown how such phenomena can be classified by the bifurcation theory of piece-wise smooth systems. Experimental results have supported the theoretical analysis [IC50],[IJ15]. Furthermore theoretical results coming form the dithering and averaging analysis for nonsmooth systems have been applied to the sliding mode control technique. In particular dithering has been proposed as an implementation method of the boundary layer control at fixed switching frequency for DC/DC power electronics converters [IC32, IC36, IC42, IC43]. Moreover experimental activities have been carried out aiming to show the effectiveness of the approach [IJ11]. The expertise in this field, together with the research activities dealing with systems and control theory, have been combined towards the editorship of a recent book on modeling and control of switched electronics systems [IB1].

Modeling and control of automated manual transmission systems [RB1], [RP1], [BC1, BC4], [IJ7, IJ13], [IC26, IC31, IC40, IC45, IC48, IC51]

The research activity dealt with an important automotive system, the automated manual transmission [BC1]. In particular it has been studied how to model transmissions with dry clutches for controlling the engagement phase during a gear shift. Some control strategies have been proposed for tracking reference speed signals (flywheel and dry clutch) in order to obtain fast and comfortable engagements [IC45, IC48, IC51]. The proposed control architecture has been validated on numerical models identified by experimental data [IC40],[IJ13]. Moreover a robustness and sensitivity analysis has been carried out, thus formulating a controller designed by the robust control technique named QFT [IC31]. The activity is nowadays aimed to defining a detailed model of the transmissibility characteristic of the clutch torque that takes into account variations of the friction coefficient depending on the slipping speed, the temperature between friction surfaces, the distribution of the radial and tangential pressures [IJ7],[IC26]. The expertise gained in such field, together with other automotive control topics, has allowed the automatic control group of University of Sannio (GRACE) to organize an International Workshop on the Future of Control in Transportation Systems. A report of the workshop has been published on the IEEE Control Systems Society web site [RP1].

Real time simulation and scheduling [RB2, RB4]

During the last years significant work has been dedicated to the real time hardware-in-the-loop simulation of complex control systems. Such methodology is aimed to the verification and validation of electronic control units (ECUs): the hardware device, together with its running firmware, is inserted into the loop completed with mathematical models that emulate other parts of the equipment under control. The models must react in real-time to the inputs coming from the device under test so as they operate in the real world. The research activity, in particular, has dealt with traction control in railway system [RB2].

A further related research activity dealt with control techniques applied to scheduling problems in real-time systems. It has been proposed a hybrid model describing the scheduling policy named Earliest Deadline First with the presence of aperiodic tasks. After deriving a Mixed Logical Dynamical model, it has been designed a controller for optimizing the choice of the execution period by exploiting prediction information related to the use of the processor [RB4].

Real time implementation of Model Predictive Control [IC13]

A recent research activity started dealing with the implementation of model predictive control laws. In particular, in [IC13] a strategy for solving in a parallel way the implicit MPC through barrier functions has been proposed.

Flight control of Unmanned Aerial Vehicles [IC10, RB3]

Recently some contributions [IC10, RB3] to the flight control design have been given within an international research cooperation aimed to implement control laws for small-size UAVs built-up with COTS.

Synchronization of parallel connected inverters [IC21]

The aim of the research consists of controlling parallel inverters connected to a common load in a decentralized way, achieving synchronization among them [IC21].

Underwater breathing apparatus with air recirculation (rebreather) [IC34, IC35]

The research activity dealt with the development of a nonlinear observer for estimat-

ing the partial pressure of the oxygen in underwater breathing apparatus [IC35]. The designed sliding mode observer has been used with a sensor fusion technique aimed to the fault diagnosis of sensors. In particular the analyzed scenario consisted of hardware redundancy of the pressure sensor (usually three sensors are used) that does not allow the detecting and isolation of the fault by classical voting logic techniques [IC34].

Modeling of steel-making processes [IC30]

Such research activity has been strongly connected to a research collaboration with the Centro Sviluppo Materiali S.p.A., aimed to deriving a model able to describe the process of stretch reducing for seamless tube production. The model, based on the analysis of the pressure distribution and tangential stresses on the contact area, allows to compute in a fast way a good estimation of the power needed by the process. The model has been validated on experimental data, highlighting the easier application compared to finite element methods, without suffering from too many approximations [IC30].

Multi agent systems and formation control [IC37]

It has been investigated a class of multi agent systems consisting of a set of agents moving on a plane and interacting among them exchanging local information with the aim of reaching a common objective or executing a task in a coordinated way. A typical task is the achieving and maintaining of a desired formation, where each agent maintains a desired distance from its neighbors. The used approach is the artificial potentials, investigating the feasibility in terms of formation reaching avoiding to get in local minima configurations. Indeed it has been shown the existence of such configurations and some techniques for getting out of such undesired configurations have been proposed [IC37].

Participation factors and model order reduction for dynamic systems [IC49]

It has been investigated the model order reduction technique based on participation factors (Selective Model Analysis) and connections with residues of the dynamic matrix have been illustrated. Moreover a new interpretation of participation factors, based on a particular relative gain array associated to the linear system, has been given [IC49].

Publications

Books

[IB1] F. Vasca and L. Iannelli, eds. *Dynamics and Control of Switched Electronic Systems*. Advances in Industrial Control. Springer, Apr. 2012. ISBN: 978-1-4471-2884-7. DOI: 10.1007/978-1-4471-2885-4.

Referred book chapters

[RB1] **L. Iannelli**. “Transmission”. In: *Encyclopedia of Systems and Control*. Ed. by J. Baillieul and T. Samad. London: Springer London, Mar. 2014, pp. 1484–1492. ISBN: 978-1-4471-5057-2. DOI: 10.1007/978-1-4471-5058-9_76. URL: http://link.springer.com/referenceworkentry/10.1007/978-1-4471-5058-9_76.

[RB2] S. Baccari, G. Cammeo, C. Dufour, **L. Iannelli**, V. Mungiguerra, M. Porzio, G. Reale, and F. Vasca. "Real-Time Hardware-in-the-Loop in Railway: Simulations for Testing Control Software of Electromechanical Train Components". In: *Railway Safety, Reliability, and Security: Technologies and Systems Engineering*. Ed. by F. Flammini. Information Science Reference, May 2012. Chap. 10, pp. 221–248. ISBN: 978-1-4666-1643-1. DOI: 10.4018/978-1-4666-1643-1.ch010. URL: http://dx.doi.org/10.4018/978-1-4666-1643-1.ch010.

[RB3] Peter Bauer et al. "UAV Lab, Open Research Platform for Unmanned Aerial Vehicles". In: *Advances in Aerospace Guidance, Navigation and Control*. Ed. by Florian Holzapfel and Stephan Theil. Springer, 2011, pp. 175–186. ISBN: 978-3-642-19816-8. DOI: 10.1007/978-3-642-19817-5_14. URL: http://dx.doi.org/10.1007/978-3-642-19817-5_14.

[RB4] V. Vacca, F. Vasca, and **L. Iannelli**. "Rate Admission Control for Hard Real-Time Task Scheduling". In: *Hybrid Systems: Computation and Control, 10th International Conference*. Ed. by A. Bemporad, A. Bicchi, and G. Buttazzo. Vol. 4416. Lecture Notes on Computer Science. Springer-Verlag Berlin, Apr. 2007, pp. 573–586. ISBN: 978-3-540-71492-7. DOI: 10.1007/978-3-540-71493-4. URL: http://dx.doi.org/10.1007/978-3-540-71493-4.

Book chapters

[BC1] **L. Iannelli**. "Automated Manual Transmissions". In: *The Impact of Control Technology*. Ed. by T. Samad and A.M. Annaswamy. 2nd ed. IEEE Control Systems Society, 2014. ISBN: 978-0-692-24262-9. URL: http://ieeecss.org/general/IoCT2-report.

[BC2] C. Pedicini, **L. Iannelli**, F. Vasca, and U.T. Jönsson. "Averaging for Power Converters". In: *Dynamics and Control of Switched Electronic Systems*. Ed. by F. Vasca and L. Iannelli. Advances in Industrial Control. Springer, 2012. Chap. 5, pp. 163–188. ISBN: 978-1-4471-2884-7. DOI: 10.1007/978-1-4471-2885-4_5.

[BC3] G. Angelone, F. Vasca, **L. Iannelli**, and M.K. Camlibel. "Dynamic and Steady-State Analysis of Switching Power Converters Made Easy: Complementarity Formalism". In: *Dynamics and Control of Switched Electronic Systems*. Ed. by F. Vasca and L. Iannelli. Advances in Industrial Control. Springer, 2012. Chap. 7, pp. 217–243. ISBN: 978-1-4471-2884-7. DOI: 10.1007/978-1-4471-2885-4_7.

[BC4] **L. Iannelli**. "Automated Manual Transmissions". In: *The Impact of Control Technology*. Ed. by T. Samad and A.M. Annaswamy. IEEE Control Systems Society, Feb. 2011, pp. 133–134. URL: http://ieeecss.org/general/impact-control-technology.

Referred journals

[IJ1] R. Iervolino, F. Vasca, and **L. Iannelli**. "Cone-Copositive Piecewise Quadratic Lyapunov Functions for Conewise Linear Systems". In: *IEEE Transactions on Automatic Control* (2015). to appear. ISSN: 0018-9286. DOI: 10.1109/TAC.2015.2409933. URL: http://dx.doi.org/10.1109/TAC.2015.2409933.

[IJ2] V. Sessa, **L. Iannelli**, and F. Vasca. “A Complementarity Model for Closed-Loop Power Converters”. In: *IEEE Transactions on Power Electronics* 29.12 (Dec. 2014), pp. 6821–6835. ISSN: 1941-0107. DOI: 10.1109/TPEL.2014.2306975. URL: http://dx.doi.org/10.1109/TPEL.2014.2306975.

[IJ3] M.K. Camlibel, **L. Iannelli**, and F. Vasca. “Passivity and complementarity”. In: *Mathematical Programming* 145.1-2 (June 2014), pp. 531–563. ISSN: 1436-4646. DOI: 10.1007/s10107-013-0678-4. URL: http://dx.doi.org/10.1007/s10107-013-0678-4.

[IJ4] **L. Iannelli**, C. Pedicini, S. Trenn, and F. Vasca. “Averaging for switched DAEs”. In: *Proceedings in Applied Mathematics and Mechanics* 13.1 (Dec. 2013), pp. 489–490. ISSN: 1617-7061. DOI: 10.1002/pamm.201310237. URL: http://dx.doi.org/10.1002/pamm.201310237.

[IJ5] D. Davino, A. Giustiniani, **L. Iannelli**, and C. Visone. “Comparison of real-time control strategies with hysteresis compensation for magnetostrictive actuators”. In: *International Journal of Applied Electromagnetics and Mechanics* 39.1–4 (2012). Impact Factor: 0.384, pp. 529–534. ISSN: 1383-5416. DOI: 10.3233/JAE-2012-1506. URL: http://dx.doi.org/10.3233/JAE-2012-1506.

[IJ6] **L. Iannelli**, F. Vasca, and G. Angelone. “Computation of Steady-State Oscillations in Power Converters Through Complementarity”. In: *IEEE Transactions on Circuits and Systems I: Regular Papers* 58.6 (June 2011). Impact Factor: 1.970, pp. 1421–1432. ISSN: 1549-8328. DOI: 10.1109/TCSI.2010.2094390. URL: http://dx.doi.org/10.1109/TCSI.2010.2094390.

[IJ7] F. Vasca, **L. Iannelli**, A. Senatore, and G. Reale. “Torque Transmissibility Assessment for Automotive Dry-Clutch Engagement”. In: *IEEE/ASME Transactions on Mechatronics* 16.3 (June 2011). Impact Factor: 2.865, pp. 564–573. ISSN: 1083-4435. DOI: 10.1109/TMECH.2010.2047509. URL: http://dx.doi.org/10.1109/TMECH.2010.2047509.

[IJ8] R. Frasca, M.K. Camlibel, I.C. Goknar, **L. Iannelli**, and F. Vasca. “Linear Passive Networks With Ideal Switches: Consistent Initial Conditions and State Discontinuities”. In: *IEEE Transactions on Circuits and Systems I: Regular Papers* 57.12 (Dec. 2010). Impact Factor: 1.573, pp. 3138–3151. ISSN: 1549-8328. DOI: 10.1109/TCSI.2010.2052511. URL: http://dx.doi.org/10.1109/TCSI.2010.2052511.

[IJ9] F. Vasca, **L. Iannelli**, M.K. Çamlıbel, and R. Frasca. “A New Perspective for Modeling Power Electronics Converters: Complementarity Framework”. In: *IEEE Transactions on Power Electronics* 24.2 (Feb. 2009). Impact Factor: 2.929, pp. 456–468. ISSN: 0885-8993. DOI: 10.1109/TPEL.2008.2007420. URL: http://dx.doi.org/10.1109/TPEL.2008.2007420.

[IJ10] **L. Iannelli**, K.H. Johansson, U. Jönsson, and F. Vasca. “Subtleties in the averaging of a class of hybrid systems with applications to power converters”. In: *Control Engineering Practice* 16.8 (Aug. 2008). Impact Factor: 1.871, pp. 961–975. ISSN: 0967-0661. DOI: 10.1016/j.conengprac.2007.10.005. URL: http://dx.doi.org/10.1016/j.conengprac.2007.10.005.

[IJ11] R. Frasca, **L. Iannelli**, and F. Vasca. “Dithered Sliding Mode Control for Switched Systems”. In: *IEEE Transactions on Circuits and Systems, part II: express briefs* 53.9 (Sept. 2006). Impact Factor: 0.922, pp. 872–876. ISSN: 1549-7747. DOI: 10.1109/TCSII.2006.880332. URL: http://dx.doi.org/10.1109/TCSII.2006.880332.

[IJ12] **L. Iannelli**, K.H. Johansson, U. Jönsson, and F. Vasca. "Averaging of Nonsmooth Systems Using Dither". In: *Automatica* 42.4 (Apr. 2006). Impact Factor: 2.273, pp. 669–676. ISSN: 0005-1098. DOI: 10.1016/j.automatica.2005.12.012. URL: http://dx.doi.org/10.1016/j.automatica.2005.12.012.

[IJ13] L. Glielmo, **L. Iannelli**, V. Vacca, and F. Vasca. "Gearshift Control for Automated Manual Transmissions". In: *IEEE/ASME Transactions on Mechatronics* 11.1 (Feb. 2006). Impact Factor: 0.979, pp. 17–26. ISSN: 1083-4435. DOI: 10.1109/TMECH.2005.863369. URL: http://dx.doi.org/10.1109/TMECH.2005.863369.

[IJ14] **L. Iannelli**, K.H. Johansson, U. Jönsson, and F. Vasca. "Dither for Smoothing Relay Feedback Systems". In: *IEEE Transactions on Circuits and Systems, Part I: Fundamental Theory and Applications* 50.8 (Aug. 2003), pp. 1025–1035. ISSN: 1057-7122. DOI: 10.1109/TCSI.2003.815194. URL: http://dx.doi.org/10.1109/TCSI.2003.815194.

[IJ15] M. di Bernardo, F. Garofalo, **L. Iannelli**., and F. Vasca. "Bifurcations in Piecewise Smooth Feedback Systems". In: *International Journal of Control* 75.16/17 (Nov. 2002), pp. 1243–1259. ISSN: 0020-7179. DOI: 10.1080/0020717021000023681. URL: http://dx.doi.org/10.1080/0020717021000023681.

Referred conference proceedings

[IC1] A. Maffei, **L. Iannelli**, and L. Glielmo. "A Colored Gauss-Seidel Approach for the Distributed Network Flow Problem". In: *Conference on Decision and Control*. accepted for publication. Dec. 2015.

[IC2] M. Saffar, H. Kebriaei, and **L. Iannelli**. "On Robust One-Leader Multi-Followers Linear Quadratic Dynamic Games". In: *Conference on Decision and Control*. accepted for publication. Dec. 2015.

[IC3] R. Iervolino, F. Vasca, and **L. Iannelli**. "Stability Analysis of Conewise Linear Systems with Sliding Modes". In: *Conference on Decision and Control*. accepted for publication. Dec. 2015.

[IC4] I. Landa et al. "The application of the data mining in the integration of RES in the smart grid". In: *Proceedings of the 5th International Conference on Power Engineering, Energy and Electrical Drives*. Riga, Latvia, May 2015.

[IC5] A. Maffei, D. Meola, G. Marafioti, G. Palmieri, **L. Iannelli**, G. Mathisen, L. Glielmo, and E. Bjerkan. "Optimal Power Flow model with energy storage, an extension towards large integration of renewable energy sources". In: *Proceedings of the 19th IFAC World Congress*. Aug. 2014.

[IC6] **L. Iannelli**, S. Mariéthoz, and F. Vasca. "New Modeling and Control Challenges Inspired by Switched Electronic Systems". In: *Proceedings of the 22nd Mediterranean Conference on Control and Automation*. Tutorial session. June 2014, pp. 670–673. ISBN: 978-1-4799-5899-3.

[IC7] **L. Iannelli**, C. Pedicini, S. Trenn, and F. Vasca. "An Averaging Result for Switched DAEs with Multiple Modes". In: *Proceedings of the 52nd IEEE Conference on Decision and Control*. Dec. 2013, pp. 1378–1383. ISBN: 978-1-4673-5714-2. DOI: 10.1109/CDC.2013.6760075. URL: http://dx.doi.org/10.1109/CDC.2013.6760075.

[IC8] V. Sessa, **L. Iannelli**, V. Acary, B. Brogliato, and F. Vasca. "Computing Period and Shape of Oscillations in Piecewise Linear Lur'e Systems: A Complementarity Approach". In: *Proceedings of the 52nd IEEE Conference on Decision and Control*. Dec. 2013, pp. 4680–4685. ISBN: 978-1-4673-5714-2. DOI: 10.1109/CDC.2013.6760622. URL: http:dx.doi.org/10.1109/CDC.2013.6760622.

[IC9] **L. Iannelli**, C. Pedicini, S. Trenn, and F. Vasca. "On averaging for switched linear differential algebraic equations". In: *Proceedings of the European Control Conference*. Zürich, Switzerland, July 2013, pp. 2163–2168. ISBN: 978-3-952-41734-8. URL: https://controls.papercept.net/conferences/conferences/ECC13/program/ECC13_ContentListWeb_3.html.

[IC10] D. Meola, **L. Iannelli**, and L. Glielmo. "Flight Control System for small-size Unmanned Aerial Vehicles: Design and Software-In-the-Loop Validation". In: *Proceedings of the 21st IEEE Mediterranean Conference on Control & Automation*. June 2013, pp. 357–382. ISBN: 978-1-4799-0995-7. DOI: 10.1109/MED.2013.6608746. URL: http://dx.doi.org/10.1109/MED.2013.6608746.

[IC11] V. Sessa, **L. Iannelli**, and F. Vasca. "Mixed Linear Complementarity Problems for the Analysis of Limit Cycles in Piecewise Linear Systems". In: *Proceedings of the 51st IEEE Conference on Decision and Control*. Dec. 2012, pp. 1023–1028. ISBN: 978-1-4673-2065-8. DOI: 10.1109/CDC.2012.6426544. URL: http://dx.doi.org/10.1109/CDC.2012.6426544.

[IC12] S. Baccari, M. Tipaldi, **L. Iannelli**, and F. Vasca. "Photoelectrothermal Model Predictive Control for Light Emitting Diodes". In: *Proceedings of the 51st IEEE Conference on Decision and Control*. Dec. 2012, pp. 394–399. ISBN: 978-1-4673-2065-8. DOI: 10.1109/CDC.2012.6426679. URL: http://dx.doi.org/10.1109/CDC.2012.6426679.

[IC13] S. Baccari, **L. Iannelli**, and F. Vasca. "A Parallel Algorithm for Implicit Model Predictive Control with Barrier Functions". In: *Proceedings of the 2012 IEEE Multi-conference on Systems and Control*. Oct. 2012, pp. 1405–1410. ISBN: 978-1-4673-4503-3. DOI: 10.1109/CCA.2012.6402342. URL: http://dx.doi.org/10.1109/CCA.2012.6402342.

[IC14] C. Pedicini, **L. Iannelli**, and F. Vasca. "The Averaging Method for Control Design and Stability Analysis of Practical Switched Systems". In: *Proceedings of the 2012 IEEE Multi-conference on Systems and Control*. Oct. 2012, pp. 1285–1290. ISBN: 978-1-4673-4503-3. DOI: 10.1109/CCA.2012.6402375. URL: http://dx.doi.org/10.1109/CCA.2012.6402375.

[IC15] R. Iervolino, F. Vasca, and **L. Iannelli**. "A Cone-Copositive Approach for the Stability of Piecewise Linear Differential Inclusions". In: *Proceedings of the 50th IEEE Conference on Decision and Control*. Dec. 2011, pp. 1062–1067. ISBN: 978-1-4673-0457-3. DOI: 10.1109/CDC.2011.6160752. URL: http://dx.doi.org/10.1109/CDC.2011.6160752.

[IC16] C. Pedicini, F. Vasca, **L. Iannelli**, and U. Jönsson. "An Overview on Averaging for Pulse-Modulated Switched Systems". In: *Proceedings of the 50th IEEE Conference on Decision and Control*. Dec. 2011, pp. 1860–1865. ISBN: 978-1-4673-0457-3. DOI: 10.1109/CDC.2011.6160796. URL: http://dx.doi.org/10.1109/CDC.2011.6160796.

[IC17] **L. Iannelli**, F. Vasca, and V. Sessa. “Computation of limit cycles in Lur’e systems”. In: *Proceedings of the American Control Conference*. San Francisco, CA, USA, June 2011, pp. 1402–1407. ISBN: 978-145770080-4. URL: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5991294&isnumber=5989965.

[IC18] F. Vasca, G. Angelone, and **L. Iannelli**. “Linear complementarity models for steady-state analysis of pulse-width modulated switched electronic systems”. In: *Proceedings of the 19th IEEE Mediterranean Conference on Control and Automation*. June 2011, pp. 400–405. ISBN: 978-145770125-2. DOI: 10.1109/MED.2011.5982981. URL: http://dx.doi.org/10.1109/MED.2011.5982981.

[IC19] F. Vasca, R. Iervolino, and **L. Iannelli**. “Stability of Lur’e systems with piecewise linear sector bounds”. In: *Proceedings of the 19th IEEE Mediterranean Conference on Control and Automation*. June 2011, pp. 1337–1342. ISBN: 978-145770125-2. DOI: 10.1109/MED.2011.5983074. URL: http://dx.doi.org/10.1109/MED.2011.5983074.

[IC20] R. Iervolino, **L. Iannelli**, and F. Vasca. “Absolute stability of Lur’e systems: A complementarity and passivity approach”. In: *Proceedings of the 49th IEEE Conference on Decision and Control*. Dec. 2010, pp. 2420–2425. ISBN: 978-1-4244-7745-6. DOI: 10.1109/CDC.2010.5718043. URL: http://dx.doi.org/10.1109/CDC.2010.5718043.

[IC21] C. Di Pietro, F. Vasca, **L. Iannelli**, and F. Oliviero. “Decentralized synchronization of parallel inverters for train auxiliaries”. In: *Proceedings of the International Conference on Electrical Systems for Aircraft, Railway and Ship Propulsion*. Bologna, Italy, Oct. 2010, pp. 1–6. ISBN: 978-1-4244-9092-9. DOI: 10.1109/ESARS.2010.5665243. URL: http://dx.doi.org/10.1109/ESARS.2010.5665243.

[IC22] **L. Iannelli** and F. Vasca. “Cyclic steady state behaviour of switched electronic systems”. In: *Proceedings of the 48th IEEE Conference on Decision and Control*. Shanghai, China, Dec. 2009, pp. 6549–6554. ISBN: 978-1-4244-3871-6. DOI: 10.1109/CDC.2009.5400610. URL: http://dx.doi.org/10.1109/CDC.2009.5400610.

[IC23] F. Vasca, **L. Iannelli**, and G. Angelone. “Steady state analysis of power converters via a complementarity approach”. In: *Proceedings of the European Control Conference*. Budapest, Hungary, Aug. 2009, pp. 3587–3592. ISBN: 978-963-311-369-1. URL: https://controls.papercept.net/conferences/scripts/abstract.pl?ConfID=5&Number=498.

[IC24] **L. Iannelli** and F. Vasca. “Computation of limit cycles and forced oscillations in discrete–time piecewise linear feedback systems through a complementarity approach”. In: *Proceedings of the 47th IEEE Conference on Decision and Control*. Cancun, Mexico, Dec. 2008, pp. 1169–1174. ISBN: 978-1-4244-3123-6. DOI: 10.1109/CDC.2008.4739076. URL: http://dx.doi.org/10.1109/CDC.2008.4739076.

[IC25] **L. Iannelli** and F. Vasca. “Analysis of periodic solutions in piecewise linear feedback system via a complementarity approach”. In: *Proceedings of the 17th IFAC World Congress*. Seoul, South Korea, July 2008, pp. 14438–14443. ISBN: 978-3-902661-00-5. DOI: 10.3182/20080706-5-KR-1001.02446. URL: http://dx.doi.org/10.3182/20080706-5-KR-1001.02446.

[IC26] F. Vasca, **L. Iannelli**, A. Senatore, and M. Taglialatela Scafati. “Modeling Torque Transmissibility for Automotive Dry Clutch Engagement”. In: *Proceedings of the American Control Conference*. Seattle (Washington), USA, June 2008, pp. 306–311. ISBN: 978-1-4244-2079-7. DOI: 10.1109/ACC.2008.4586508. URL: http://dx.doi.org/10.1109/ACC.2008.4586508.

[IC27] R. Frasca, M.K. Çamlıbel, I.C. Goknar, **L. Iannelli**, and F. Vasca. “State Discontinuity Analysis of Linear Switched Systems via Energy Function Optimization”. In: *Proceedings of the IEEE International Symposium on Circuits and Systems*. Seattle (Washington), USA, May 2008, pp. 540–543. ISBN: 978-1-4244-1683-7. DOI: 10.1109/ISCAS.2008.4541474. URL: http://dx.doi.org/10.1109/ISCAS.2008.4541474.

[IC28] F. Vasca, **L. Iannelli**, and M.K. Çamlıbel. “A new perspective in power converters modelling: complementarity systems”. In: *Proceedings of the 38th IEEE Power Electronics Specialists Conference*. Orlando (Florida), USA, June 2007, pp. 1817–1823. DOI: 10.1109/PESC.2007.4342277. URL: http://dx.doi.org/10.1109/PESC.2007.4342277.

[IC29] **L. Iannelli**, F. Vasca, and M.K. Çamlıbel. “Complementarity and passivity for piecewise linear feedback systems”. In: *Proceedings of the 45th IEEE Conference on Decision and Control*. San Diego (California), USA, Dec. 2006, pp. 4212–4217. DOI: 10.1109/CDC.2006.377145. URL: http://dx.doi.org/10.1109/CDC.2006.377145.

[IC30] M. Taglialatela Scafati, **L. Iannelli**, A. Lucarelli, and C. Pietrosanti. “A Stand Power Predictive Model for Tube Stretch Reducing Mills”. In: *Proceedings of the IFAC Workshop on Automation in Mining, Minerals and Metal Industry*. Cracow, Poland, Sept. 2006, pp. 235–240. ISBN: 83-922498-2-8.

[IC31] L. Glielmo, P.O. Gutman, **L. Iannelli**, and F. Vasca. “Robust Smooth Engagement of an Automotive Dry Clutch”. In: *Proceedings of the 4th IFAC Symposium on Mechatronic Systems*. Heidelberg, Germany, Sept. 2006, pp. 632–637. ISBN: 978-3-902661-17-3. DOI: 10.3182/20060912-3-DE-2911.00110. URL: http://dx.doi.org/10.3182/20060912-3-DE-2911.00110.

[IC32] R. Frasca, **L. Iannelli**, and F. Vasca. “Experimental Validation of Dithered Sliding Mode Control for Switched Systems”. In: *Proceedings of the American Control Conference*. Minneapolis (Minnesota), USA, June 2006, pp. 5905–5910. ISBN: 1-4244-0209-3. DOI: 10.1109/ACC.2006.1657667. URL: http://dx.doi.org/10.1109/ACC.2006.1657667.

[IC33] **L. Iannelli**, K.H. Johansson, U. Jönsson, and F. Vasca. “Subtleties in the averaging of hybrid systems with applications to power electronics”. In: *Proceedings of the 2nd IFAC Conference on Analysis and Design of Hybrid Systems*. Alghero, Italy, June 2006, pp. 247–252. ISBN: 978-0-08-044613-4. DOI: 10.3182/20060607-3-IT-3902.00045. URL: http://dx.doi.org/10.3182/20060607-3-IT-3902.00045.

[IC34] S. Carotenuto, **L. Iannelli**, S. Manfredi, and S. Santini. “Sensor fusion by using a sliding observer for an underwater breathing system”. In: *Proceedings of the 44th IEEE Conference on Decision and Control*. Seville, Spain, Dec. 2005, pp. 7662–7667. ISBN: 0-7803-9567-0. DOI: 10.1109/CDC.2005.1583399. URL: http://dx.doi.org/10.1109/CDC.2005.1583399.

[IC35] F. Garofalo, **L. Iannelli**, S. Manfredi, and S. Santini. “A sliding observer for closed-circuit underwater breathing apparatus”. In: *Proceedings of the 16th IFAC World Congress*. Prague, Czech Republic, July 2005, pp. 97–102. ISBN: 978-0-08-045108-4. DOI: 10.3182/20050703-6-CZ-1902.01958. URL: http://dx.doi.org/10.3182/20050703-6-CZ-1902.01958.

[IC36] R. Frasca, **L. Iannelli**, and F. Vasca. “Boundary Layer Using Dithering in Sliding Mode Control”. In: *Proceedings of the 16th IFAC World Congress*. Prague, Czech Republic, July 2005, pp. 616–621. ISBN: 978-0-08-045108-4. DOI: 10.3182/20050703-6-CZ-1902.00758. URL: http://dx.doi.org/10.3182/20050703-6-CZ-1902.00758.

[IC37] M.C. De Gennaro, **L. Iannelli**, and F. Vasca. “Formation Control and Collision Avoidance in Mobile Agent Systems”. In: *Proceedings of the 13th IEEE Mediterranean Conference on Control and Automation*. Limassol, Cyprus, June 2005, pp. 796–801. ISBN: 0-7803-8936-0. DOI: 10.1109/.2005.1467116. URL: http://dx.doi.org/10.1109/.2005.1467116.

[IC38] M.K. Çamlıbel, **L. Iannelli**, and F. Vasca. “Modelling switching power converters as complementarity systems”. In: *Proceedings of the 43rd IEEE Conference on Decision and Control*. Paradise Island, The Bahamas, Dec. 2004, pp. 2328–2333. ISBN: 0-7803-8682-5. DOI: 10.1109/CDC.2004.1428741. URL: http://dx.doi.org/10.1109/CDC.2004.1428741.

[IC39] **L. Iannelli**, K.H. Johansson, U. Jönsson, and F. Vasca. “On the averaging of a class of hybrid systems”. In: *Proceedings of the 43rd IEEE Conference on Decision and Control*. Paradise Island, The Bahamas, Dec. 2004, pp. 1400–1405. ISBN: 0-7803-8682-5. DOI: 10.1109/CDC.2004.1430239. URL: http://dx.doi.org/10.1109/CDC.2004.1430239.

[IC40] L. Glielmo, **L. Iannelli**, F. Vasca, and V. Vacca. “Speed control for automated manual transmission with dry clutch”. In: *Proceedings of the 43rd IEEE Conference on Decision and Control*. Paradise Island, The Bahamas, Dec. 2004, pp. 1709–1714. ISBN: 0-7803-8682-5. DOI: 10.1109/CDC.2004.1430290. URL: http://dx.doi.org/10.1109/CDC.2004.1430290.

[IC41] **L. Iannelli**, K.H. Johansson, U. Jönsson, and F. Vasca. “Dither shape in the averaging of switched systems”. In: *Proceedings of the American Control Conference*. Boston (Massachussets), USA, July 2004, pp. 5812–5817. ISBN: 0-7803-8335-4.

[IC42] **L. Iannelli** and F. Vasca. “Dithering for sliding mode control of DC/DC converters”. In: *Proceedings of the 35th IEEE Annual Power Electronics Specialists Conference*. Aachen, Germany, June 2004, pp. 1616–1620. ISBN: 0-7803-8399-0. DOI: 10.1109/PESC.2004.1355667. URL: http://dx.doi.org/10.1109/PESC.2004.1355667.

[IC43] **L. Iannelli** and F. Vasca. “Dither for chattering reduction in sliding mode control systems”. In: *Proceedings of the IEEE International Symposium on Circuits and Systems*. Vancouver, Canada, May 2004, pp. 709–712. ISBN: 0-7803-8251-X. DOI: 10.1109/ISCAS.2004.1329102. URL: http://dx.doi.org/10.1109/ISCAS.2004.1329102.

[IC44] **L. Iannelli**, K.H. Johansson, U. Jönsson, and F. Vasca. “Effects of dither shapes in nonsmooth feedback systems: experimental results and theoretical insight”. In: *Proceedings of the 42nd IEEE Conference on Decision and Control*. Maui (Hawaii), USA, Dec. 2003, pp. 4285–4290. ISBN: 0-7803-7924-1. DOI: 10.1109/CDC.2003.1271824.

[IC45] L. Glielmo, **L. Iannelli**, V. Vacca, and F. Vasca. "Modelling and Control for Automated Manual Transmissions with Dry Clutch". In: *Proceedings of selected paper of the 3rd International Conference on Applied Automatic Systems*. Ohrid, Macedonia, Sept. 2003, pp. 79–88. ISBN: 9989-2175-1-3.

[IC46] **L. Iannelli**, K.H. Johansson, U. Jönsson, and F. Vasca. "Practical Stability and Limit Cycles of Dithered Relay Feedback Systems". In: *Proceedings of the IEE European Control Conference*. Cambridge, UK, Sept. 2003.

[IC47] **L. Iannelli**, K.H. Johansson, U. Jönsson, and F. Vasca. "Analysis of dither in relay feedback systems". In: *Proceedings of the 41st IEEE Conference on Decision and Control*. Las Vegas (Nevada), USA, Dec. 2002, pp. 4425–4430. ISBN: 0-7803-7516-5. DOI: 10.1109/CDC.2002.1185069. URL: http://dx.doi.org/10.1109/CDC.2002.1185069.

[IC48] F. Garofalo, L. Glielmo, **L. Iannelli**, and F. Vasca. "Optimal Tracking for Automotive Dry Clutch Engagement". In: *Proceedings of the 15th IFAC World Congress*. Barcelona, Spain, July 2002, pp. 367–372. ISBN: 978-0-08-044295-2. DOI: 10.3182/20020721-6-ES-1901.01529.

[IC49] F. Garofalo, **L. Iannelli**, and F. Vasca. "Participation Factors and their Connections to Residues and Relative Gain Array". In: *Proceedings of the 15th IFAC World Congress*. Barcelona, Spain, July 2002, pp. 125–130. ISBN: 978-0-08-044295-2. DOI: 10.3182/20020721-6-ES-1901.00182. URL: http://dx.doi.org/10.3182/20020721-6-ES-1901.00182.

[IC50] M. di Bernardo, F. Vasca, and **L. Iannelli**. "Experimental detection of bifurcations and sliding in DC-DC power converters". In: *Proceedings of the IEEE International Symposium on Circuits and Systems*. Phoenix, AZ, USA, May 2002, pp. 385–388. ISBN: 0-7803-7448-7. DOI: 10.1109/ISCAS.2002.1009858. URL: http://dx.doi.org/10.1109/ISCAS.2002.1009858.

[IC51] F. Garofalo, L. Glielmo, **L. Iannelli**, and F. Vasca. "Smooth engagement for automotive dry clutch". In: *Proceedings of the 40th IEEE Conference on Decision and Control*. Orlando (Florida), USA, Dec. 2001, pp. 529–534. ISBN: 0-7803-7061-9. DOI: 10.1109/.2001.980156. URL: http://dx.doi.org/10.1109/.2001.980156.

Patents

[PT1] S. Baccari, **L. Iannelli**, M. Tipaldi, and F. Vasca. "Smart led supply (sls) - alimentatore intelligente per led". Italian patent 0001414486 (IT). Mar. 13, 2015. URL: http://www.uibm.gov.it/uibm/dati/Titolare.aspx?load=info&id=2004221&table=Invention&#ancoraSearch.

Reports

[RP1] L. Glielmo, G.J. Balas, J. Bokor, F. Vasca, M. Lovera, M. Jankovic, **L. Iannelli**, and K. Matsumoto. *A Perspective View on the Future of Control in Transportation System*. Project report. IEEE Control Systems Society, Dec. 2011. URL: http://ieeecss.org/sites/ieeecss.org/files/documents/iwfct_final_14dec11_.pdf.

Thesis

[TH1] **L. Iannelli**. "Dither for smoothing relay feedback systems: an averaging approach". PhD thesis. Dipartimento di Informatica e Sistemistica, Università di Napoli Federico II, Napoli, Italy, Nov. 2002. URL: http://www.ing.unisannio.it/iannelli/public/phd_thesis.pdf.

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