Davide M. Raimondo

PERSONAL INFORMATION

Born: 07-11-1981 in Pavia (Italy)
Phone: +39 333 3525930
Home address: via Aselli 52, 27100, Pavia, Italy
Email: davide.raimondo@unipv.it
Website: http://sisdin.unipv.it/labsisdin/raimondo/raimondo.php

LANGUAGES

***Italian*:** mother tongue. ***English*:** proficient. ***Spanish*:** fluent. ***German*:** basic knowledge.

RESEARCH INTERESTS

Theory: control, fault detection and isolation, optimization.
Applications: energy, medical, robotics, logistics.

BIBLIOMETRIC PROFILE

Davide M. Raimondo currently (October 10, 2017) has an h index of 18 (Scopus) - 22 (Google Scholar) and a number of citations equal to 1428 (Scopus) - 2284 (Google Scholar). [1]

EDUCATION

Nov. 05 – Nov. 08	UNIVERSITY OF PAVIA ***Ph.D. in electronic, computer and electrical engineering,*** Identification and Control of Dynamical Systems Laboratory, Thesis title: *Nonlinear Model Predictive Control: Stability, Robustness and Applications.* Advisor: Prof. Lalo Magni (Ph.D. thesis defended on January 16, 2009)	Pavia *Italy*
Oct. 03 – Jul. 05	UNIVERSITY OF PAVIA ***M.Sc.*** in Automatic Control Engineering. 110/110 cum laude	Pavia *Italy*
Oct. 00 – Sep. 03	UNIVERSITY OF PAVIA ***B.Sc.*** in Computer Science Engineering. 110/110 cum laude	Pavia *Italy*
Nov. 00 – Jul. 05	ALMO COLLEGIO BORROMEO ***Student***. Recognized by the Italian Ministry of Education, University and Research as a "Highly qualified cultural institute".	Pavia *Italy*

[1] According to Google Scholar Metrics, the top journals in the field of Automation & Control Theory are Automatica (impact factor 3.635) and IEEE Transactions on Automatic Control (impact factor 2.777).

Nov. 00 – Nov. 05	INSTITUTE FOR ADVANCED STUDY OF PAVIA (IUSS) ***Student***. Recognized by the Italian Ministry of Education, University and Research as a Superior Graduate Schools with "University Status".	Pavia *Italy*

ACADEMIC AND RESEARCH APPOINTMENTS

May 15 –	UNIVERSITY OF PAVIA **Associate Professor** at the Identification and Control of Dynamical Systems Laboratory, Department of Electrical, Computer and Biomedical Engineering	Pavia *Italy*
Jan. 13 –	UNIVERSITY OF PAVIA **Head** of the educational Process Control Laboratory, Department of Electrical, Computer and Biomedical Engineering	Pavia *Italy*
Oct. 17 – Feb 18	UNIVERSITY OF KONSTANZ **Visiting Professor,** Department of Mathematics and Statistics, University of Konstanz	Konstanz *Germany*
Dec. 10 – May 15	UNIVERSITY OF PAVIA **Assistant Professor** (**tenured 29/12/2013**) at the Identification and Control of Dynamical Systems Laboratory, Dept. of Electrical, Computer and Biomedical Engineering	Pavia *Italy*
Mar. 15 – Apr. 15	VIENNA UNIVERSITY OF TECHNOLOGY (TU WIEN) **Visiting Professor**, Computer Engineering PhD School	Vienna *Austria*
Mar. 14 – Apr. 14	VIENNA UNIVERSITY OF TECHNOLOGY (TU WIEN) **Visiting Professor**, Computer Engineering PhD School	Vienna *Austria*
Jan. 09 – Dec. 10	SWISS FEDERAL INSTITUTE FOR TECHNOLOGY (ETHZ) **Postdoc** at the Automatic Control Laboratory Dept. of Information Technology and Electrical Engineering	Zürich *Switzerland*
Nov. 08 – Dec. 08	SWISS FEDERAL INSTITUTE FOR TECHNOLOGY (ETHZ) Employee at the Automatic Control Laboratory Dept. of Information Technology and Electrical Engineering	Zürich *Switzerland*
Jul. 07 – Jan. 08	UNIVERSITY OF PAVIA Contracted for the development of predictive control techniques for biological applications	Pavia *Italy*
Sep. 05 – Nov. 05	UNIVERSITY OF PAVIA Contracted for the Development of robust model predictive controllers for nonlinear systems.	Pavia *Italy*

RESEARCH STAYS

Oct. 15 – Nov. 15	MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) Prof. Braatz group, Department of Chemical Engineering	Cambridge *USA*
Jan. 15 – Feb. 15	MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) **Visiting scholar** in Prof. Braatz group, Department of Chemical Engineering	Cambridge *USA*

Sep. 14 – Nov. 14	MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) **Visiting scholar** in Prof. Braatz group, Department of Chemical Engineering	Cambridge *USA*
Mar. 14 – May. 14	VIENNA UNIVERSITY OF TECHNOLOGY (TU WIEN) Institute of Computer Engineering	Vienna *Austria*
Aug. 13 – Sep. 13	MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) **Visiting scholar** in Prof. Braatz group, Department of Chemical Engineering	Cambridge *USA*
Mar. 12 – Jun. 12	MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) **Visiting scholar** in Prof. Braatz group, Department of Chemical Engineering	Cambridge *USA*
Oct. 06 – May 07	UNIVERSITY OF SEVILLE **Academic Guest** in the Department of Automation and System Engineering	Sevilla *Spain*

AWARDS

Automatica Paper Prize Award over the years 2014-2016 for the paper J.K. Scott, D.M. Raimondo, G.R. Marseglia, R.D. Braatz: Constrained zonotopes: A new tool for set-based estimation and fault detection. Automatica, Vol. 69, July 2016, pp. 126-136

QUALIFICATIONS

Jan. 14	Qualified at the national level (national scientific habilitation) for the position of Associate Professor, section 09/G1 Automatica	*Italy*
Nov. 05	UNIVERSITY OF PAVIA Professional practice exam ("esame di stato") for **engineering license** passed in Pavia, Italy.	Pavia *Italy*

PROJECTS AND FUNDING

European Projects

- SEMI40 (2016-2019) *Power Semiconductor and Electronics Manufacturing 4.0*
  H2020-EU.2.1.1.7. – ECSEL (EU Contribution to UNIPV Unit: 150K€)
  Role: participant
- AP@HOME (2010-2014) *Bringing the Artificial Pancreas Home*
  EU's Seventh Framework Programme (EU Contribution to UNIPV Unit: ~500K€)
  Role: participant
- IMPROVE (2009-2012) *Implementing manufacturing science solutions to increase equipment productivity and fab performance*
  European Nanoelectronics Initiative Advisory Council
  Role: participant
- FEEDNETBACK (2008-2011)
  EU's Seventh Framework Programme
  Role: participant

Italian Projects

- PRIN project, Ministry of University and Scientific Research and Technology, Italy
  Forget Diabetes: Adaptive Physiological Artificial Pancreas (FORGETDIAB)
  Role: participant

- PRIN project, Ministry of University and Scientific Research and Technology, Italy
  Artificial pancreas: physiological models, control algorithms and clinical trial
  Pavia Unit: *Predictive control algorithms for the artificial pancreas* (2008 -2010)
  Role: participant

Local Projects

- PROJECT PAVIA-BOSTON
  Project promoted by the Pro-Rector in charge of the Third Mission, University of Pavia.
  Role: recipient of 15K€ for research stays at MIT

Contracts

- STELAR S.R.L. (2016-2017) - 60K€
  Characterization, modelling and simulation software tool of the magnetic field control loop for Fast Field Cycling (FFC) NMR
  Role: principal investigator

- CESI-RICERCA, Centro Elettrotecnico Sperimentale Italiano (2006)
  Research contract number: ODAR06436
  Optimized procedures for the start-up of combined cycle plants
  Role: participant

RESULTS IN TECHNOLOGY TRANSFER

Patents

- Magni L. D. M. Raimondo, G. De Nicolao, C. Dalla Man and C. Cobelli **Predictive Control Based System And Method For Control Of Insulin Delivery In Diabetes Using Glucose Sensing,** International Patent Application Serial No. PCT/US2008/082063, filed 31/10/2008

SOFTWARE

Promoter and co-author of LIONSIMBA

Li-ion Simulation Battery (LIONSIMBA) toolbox
A simulation environment for Li-ion batteries

Official website: http://sisdin.unipv.it/labsisdin/lionsimba.php

Available on GitHub: https://github.com/lionsimbatoolbox/LIONSIMBA

More than 400 downloads!

TEACHING AND STUDENT SUPERVISION

Lecturer

Ph.D. courses

2015	Model Predictive Control (Special Topics in Cyber-Physical Systems), Computer Engineering PhD School, TU Wien (role: lecturer, ~30 hours, ~15 students)	Vienna *Austria*
2014	Short course on Moving Horizon Estimation as part of the Hybrid Systems Course, TU Wien (role: lecturer, ~10 hours, ~15 students)	Vienna *Austria*
2014	Model Predictive Control (Special Topics in Cyber-Physical Systems), Computer Engineering PhD School, TU Wien (role: lecturer, ~30 hours, ~15 students)	Vienna *Austria*

Master courses

2016-2017	Advanced Automation and Control, University of Pavia (role: lecturer, ~40 hours/year, 5 credits, ~30 students) Course taught in English	Pavia *Italy*

Bachelor courses

2016-2017	Basics of Automatic Control, University of Pavia (~100 hours/year, 9 credits, ~100 students)	Pavia *Italy*
2015-2016	Basics of Automatic Control, University of Pavia (~100 hours/year, 9 credits, ~100 students)	Pavia *Italy*
2014-2015	Basics of Automatic Control, University of Pavia (~100 hours/year, 9 credits, ~100 students)	Pavia *Italy*
2013-2014	Basics of Automatic Control, University of Pavia (~100 hours/year, 9 credits, ~100 students)	Pavia *Italy*
2012-2013	Automatic Control and Process Control, University of Pavia (~100 hours/year, 9 credits, ~30 students)	Mantova *Italy*
2011-2012	Automatic Control and Process Control, University of Pavia (~100 hours/year, 9 credits, ~30 students)	Mantova *Italy*
2006-2007	Introduction to systems analysis, University of Pavia (~20 hours/year, 1 credit, ~100 students)	Pavia *Italy*

Teaching assistant

2009-2011	Model Predictive Control, ETH (seminars, ~10 hours/year)	Zürich *Switzerland*
2007	Master in Methods for Management of Complex Systems, Intsitute for Advanced Study, IUSS, (seminars ~10 hours)	Pavia *Italy*

2001-2005	Tutor of computer programming (Java), University of Pavia (~50 hours/year)	Pavia *Italy*

Teaching rating

In the teaching evaluation questionnaires, I obtained an average rating of 8.22/10 (departmental average 8.15/10) for the academic year 2014-2015 and an average rating of 8.97/10 (departmental average 8.14/10) for the academic year 2015-2016.

Participation as president in exam committees

- Course: *Basics of Automatic Control*, University of Pavia, Pavia, Italy. Number of evaluated tests: 252 - Number of exam sessions: 15
- Course: *Automatic Control and Process Control*, University of Pavia, Mantova, Italy. Number of evaluated tests: 85 - Number of exam sessions: 18

Student Supervision

Ph.D. students

Nov. 17 -	Andrea Pozzi Role: supervisor Topic: **Advanced Battery Management Systems**	Pavia *Italy*
Nov. 16 -	Alessio Mosca Role: supervisor Topic: **Cooperative control**	Pavia *Italy*
Nov. 16 -	Giacomo Galuppini Role: co-advisor (supervisor: Prof. Lalo Magni) Topic: **Fast field cycling**	Pavia *Italy*
Nov. 13 -	Marcello Torchio Role: co-advisor (supervisor: Prof. Lalo Magni) Topic: **Modeling and Control of Lithium-ion Batteries**	Pavia *Italy*
Nov. 12 – Jan. 16	Giuseppe Roberto Marseglia Role: supervisor Topic**: Active Fault Diagnosis and Fault Tolerant Control**	Pavia *Italy*

Master thesis

Pavia, Italy

1. **Optimal power flow** applied to a microgrid in islanded mode, G. Milani
2. Control of **Lithium-ion batteries**, A. Pozzi
3. Study for a **Field Frequency Lock** for FFC NMR applications, G. Galuppini (co-advisor)
4. **Wind farm layout optimization** on a continuous 3D domain: a scalable approach, E. Messori
5. **Wind farm layout optimization** on a discretized 3D domain, F. Acerbi
6. Implementation in COMSOL Multiphysics of an electrochemical model of **lithium-ion battery**, C. Sarchi
7. Optimal placement **of wind turbines** on a continuous domain: an MILP-based approach, A.

Arbasini
8. **Fast evaluation** of explicit nonlinear MPC**,** F. Fassina (Erasmus at Ruhr Universität Bochum)
9. Automatic remote control of 1:27 scale **race cars**, F. Fiorentino (Erasmus at Ruhr Universität Bochum)
10. Optimal placement of **wind turbines** of a wind farm, D. Colli
11. Design and implementation of **infrared vision system** and **breaking control** of a small-scale train, A. Barbieri
12. Nonlinear model predictive control of **glycaemia** in type 1 diabetic patients, S. Riverso
13. Validation of a linear model predictive control of **glycaemia** in type 1 diabetic patients, G. Ferrario
14. Experimentation in silico of predictive control algorithms for the control of **glycaemia** in type 1 diabetic patients, R. Tessera
15. Modeling and control of the start-up phase of a **combined cycle power plant**, A. Ferramosca
16. Predictive control of the start-up phase of a **combined cycle power plant**, D. Polli

Zürich, Switzerland

1. Implementation of **a stochastic reachability** framework for **surveillance** with pan-tilt-zoom cameras, S. Aufdenblatten
2. **Reachability** analysis of **nonlinear systems**: an approach based on conservative approximations, O. Huber
3. **Patrolling** algorithms for pan-tilt-zoom **cameras**, M. Pattarello
4. Control of Multiple Cameras for Tracking and **Surveillance**, D. Sturzenegger
5. A set theoretic method for verifying feasibility of a **fast** explicit **nonlinear** model predictive **controller**, S. Riverso

Bachelor thesis

Pavia, Italy

1. **Test-bed** for the validation of **dial-to-ride strategies** in semiconductor production, G. Saccani
2. Design and control of a **two-joint inverted pendulum**, R. Carminati
3. **GPS anti-theft device** for vehicles: an application based on Arduino and MIT inventor, M. Messina
4. **Model Predictive Control** of a small-scale **crane**, G. Brigo
5. **Modeling** of a **quadricopter**, A. Ziruddu
6. Design and development of a **conveyor belt** and a **vision system** for **cargo handling process**, B. Codecà
7. Level control of a **tank** via **conventional and renewable sources**, F. Uberti
8. Realization and **Pure Pursuit control** of a mobile robot, F. Napoli
9. **Advanced control** of a **mobile robot**, L. Borrelli
10. Realization of an **infrared vision system** for control applications, I. Triggiani
11. Blade MCX2 **Helicopter**: **reverse engineer** of **the remote controller** for the automatic control of the aircraft, A. Rossetti
12. Identification and advanced control of a **solar tracker**, G.M. Riolo
13. Realization of a remote **control** system for a **small-scale submarine**, G. Simone
14. **Design** and **realization** of a small-scale **crane,** S. Termini
15. **Modeling** and **control** of a small-scale **crane,** L. Zurlo
16. Design and control of a **solar tracker**, G. Morandi

17. **Hand gesture control** of vehicles, E. Maranini
18. **Design and construction** of a **small-scale submarine**, C. Vazzana
19. Design and validation of a **control system** for a **small-scale submarine**, D. Gioria
20. **Design and implementation** of an automatic **system for handling goods,** L. Vantadori
21. **Modeling** and **control** of a **system for handling goods**, A. Spinoglio
22. Simulation and **implementation** of **control** strategies for an **RC helicopter**, F. Seccamonte
23. **Path following control** of a Lego Mindstorm mobile vehicle, D. Procop
24. **Speed control** of a small-scale train with MPC, M. Arcuri
25. Design and implementation of a 3D **infrared vision system**, M. Grecchi
26. Adaptive control of an RC helicopter based on the **modeling** of the **lithium battery**, G. Bellazzi
27. Design of a remote control system for **RC helicopter**, A. Ricci
28. **Embedded tracking control** of an inverted pendulum, M. Rotulo
29. **Embedded predictive control** of an inverted pendulum, A. Mezzadra

Zürich, Switzerland

1. MPC based **Trajectory Tracking** for 1:43 scale race cars, L. Wunderli
2. Software Framework for **Position Control** of 1:43 scale **race cars**, F. Ferrara
3. Infrared based **vision system** for tracking 1:43 scale **race cars**, M. Rutschmann

Internship supervision

1. Usability study of a **mobile application**, M. Pichetto
2. Development of control logics of a **coal power plant**, E. Strotz
3. Standardization of HMI interfaces on **injection presses**, D. Prando
4. Development of a distributed control system for the supervision of a **metro station**, N.S.E. Fady
5. Implementation of **cryptographic** algorithms for the security of **telemetric data** archives, L. Merlano

OTHER INSTITUTIONAL ACTIVITIES

Jul. 15 –	Coordinator of promotional activities (Area Automatica) COR Centro Orientamento	Pavia *Italy*
2012–2016	Member of the committee for the qualification to the profession of Computer Science Engineer	Pavia *Italy*
Nov. 17 –	Member of the Scientific Board of the PhD program in Electronics, Computer science and Electrical Engineering	Pavia *Italy*
Aug. 17 –	Member of the board of the Department of Industrial Engineering and Information	Pavia *Italy*

External Ph.D. thesis committee member

2014	PhD committee member for Feng Xu, Automatic Control Departament, Universitat Politècnica de Catalunya	Barcelona *Spain*
2013	PhD committee member for Isabel Jurado Flores, Department of Systems Engineering and Automation, University of Seville	Sevilla *Spain*

INVITED SEMINARS, PARTICIPATION TO INTERNATIONAL CONFERENCES

Participation to international conferences

Overall 18 presentations held at international conferences (CDC, ACC, ECC, NMPC, IFAC WC, IFAC NOLCOS, IFAC NecSys'09, Systol, Diabetes Technology Society Annual Meetings).

Invited talks held at international conferences

Jul. 13	*Approximate nonlinear explicit MPC based on reachability analysis,* European Control Conference (ECC) 2013	Zürich *Switzerland*

Papers at invited sessions of international conferences

Sep. 10	*Fast explicit nonlinear model predictive control via multi-resolution function approximation with guaranteed stability,* Symposium on Nonlinear Control Systems (NOLCOS) 2010	Bologna *Italy*
Sep. 10	*A Nonlinear Model Predictive Control Scheme with Multirate Integral Sliding Mode,* Symposium on Nonlinear Control Systems (NOLCOS) 2010	Bologna *Italy*
Aug. 07	*Regional Input-to-State Stability of Min-Max Model Predictive Control,* Symposium on Nonlinear Control Systems (NOLCOS) 2007	Pretoria *South Africa*
Aug. 07	*A Decentralized MPC Algorithm for Nonlinear Systems,* Symposium on Nonlinear Control Systems (NOLCOS) 2007	Pretoria *South Africa*

Invited seminars

Jun. 16	*Optimal charging of Li-ion cells: a model predictive control approach*	Magdeburg *Germany*
Jun. 16	*Model Predictive Control algorithms for the charging of Li-ion cells*	Braunschweig *Germany*
Feb. 16	*Optimal Design of an Advanced Battery Management System Suitable for Hybrid Electric Vehicles, IIT, Italian Institute of Technology*	Genova *Italy*
Dec. 15	*Input Design for Active Fault Diagnosis,* Imperial College London, *Control and Power Seminar Series*	London *UK*
Oct. 15	*Input Design for Active Fault Diagnosis,* Boston University, *Center for Information & Systems Engineering*	Boston *USA*
Aug .15	*Input Design for Active Fault Diagnosis, Electrical Engineering and Computer Sciences Department, University of California, Berkeley*	Berkeley *USA*
Apr. 15	*Real-time Model Predictive Control for Optimal Charging of a Li-ion Battery,* TU Wien, *Ring Lecture Current Trends in Computer Science*	Vienna *Austria*
May 14	*Active Fault Diagnosis for Uncertain Systems,* TU Wien, *Ring Lecture Current Trends in Computer Science*	Vienna *Austria*

Jan. 14	*Active Input Design for Fault Diagnosis: a Set-Based Approach, Automatic Control Laboratory,* TU Wien	Vienna *Austria*
Jan. 14	*Active Input Design for Fault Diagnosis: a Set-Based Approach, Automatic Control Laboratory,* ABB Schweiz AG	Baden *Switzerland*
Jan. 14	*Active Input Design for Fault Diagnosis: a Set-Based Approach, Automatic Control Laboratory,* IfA, ETH	Zürich *Switzerland*
Sep. 13	*Active Input Design for Fault Diagnosis: a Set-Based Approach,* Automatic Control Laboratory, EPFL	Lausanne *Switzerland*
Sep. 13	*Design of Active Inputs for Set-Based Fault Diagnosis.* Mitsubishi Electric Research Laboratories	Cambridge *USA*
Apr. 13	*Optimal placement of wind turbines,* Institute of Cartography and Geoinformation (IKG), ETH	Zürich *Switzerland*
May 12	*Time-optimal control for constrained nonlinear systems: A fast explicit approximation,* Process systems engineering laboratory seminar, Department of Chemical Engineering, MIT	Cambridge *USA*
Jan. 12	*An approximate explicit minimum time controller for nonlinear systems with feasibility and stability guarantees, ABB Schweiz AG*	Baden Switzerland
Oct. 11	*An approximate explicit minimum time controller for nonlinear systems with feasibility and stability guarantees, Ruhr-Universität Bochum*	Bochum *Germany*
May 08	*Robust Nonlinear Model Predictive Control, Automatic Control Laboratory, Department of Information Technology and Electrical Engineering, ETH*	Zürich *Switzerland*

EDITORIAL ACTIVITY AND PROFESSIONAL SERVICE

Editorial Board

2016-	Associate Editor, Conference Editorial Board, IEEE Control Systems Society
May 2015 -	Subject editor for the journal Optimal Control Applications and Methods

International Program Committees

Nov. 2015 -	Member of the stirring committee of the IEEE Technical committee on Process Control	
2015	International program committee member of the Nonlinear Model Predictive Control 2015 (NMPC'15)	Sevilla *Spain*
2015	Conference Editorial Board member of the European Control Conference 2015 (ECC'15)	Linz *Austria*
2015	International program committee member of the International Symposium on Advanced Control of Chemical Processes (ADCHEM 2015)	Whistler *Canada*

2014	Conference Editorial Board member of the European Control Conference 2014 (ECC'14)	Strasbourg *France*
2013	International program committee member of the European Control Conference 2013 (ECC'13)	Zürich *Switzerland*
2012	International program committee member of the conf. Nonlinear Model Predictive Control 2012 (NMPC'12)	Noordwijkerhout *The Netherlands*

Organization of scientific events

2010	Invited session "Nonlinear Model Predictive Control", 10th IFAC Symposium on Nonlinear Control Systems	Bologna *Italy*
2008	Co-chair of the International workshop on Assessment and Future Direction of Nonlinear Model Predictive Control	Pavia *Italy*
2007	Invited session "New Development in NMPC", 7th IFAC Symposium on Nonlinear Control Systems	Pretoria *South Africa*

Reviewer activity

Reviewer of Applied Mathematics and Computation, Automatica, IEEE Transaction on Automatic Control, IEEE Transaction on Biomedical Engineering, International Journal of Control, International Journal of Adaptive Control and Signal Processing, International Journal of Robust and Nonlinear Control, International Journal of System Science, Journal of Process Control, Journal of Biomedical Informatics, SIAM Journal on Control and Optimization, System & Control Letters, Springer Lectures Notes in Control and Information Sciences Series (LNCIS), and several control conferences (CDC, ACC, ECC, IFAC WC, IFAC NOLCOS, IFAC NECSYS, IFAC NMPC, MTNS).