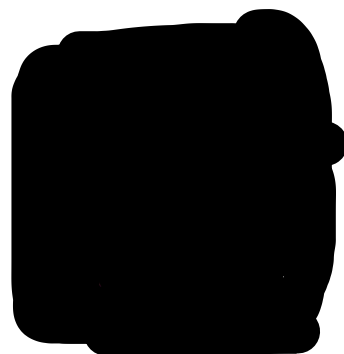


# Mattia Mattioni

*PhD in Automatica*



Ai fini della pubblicazione in ottemperanza all'art. 15 del D. Lgs. 33/2013.

**Short bio** Class 1990, he received his Bachelor Degree (Laurea) and Master of Science (Laurea Magistrale) in Control Engineering from La Sapienza, Università di Roma (Italy), both Magna cum Laude. In 2015, he received the double degree for the Master de Recherche en Automatique, Traitement du Signal et des Images (M2R ATSI) through the bilateral agreement *Elisa* with Université Paris-Sud. He received the PhD in System and Control Theory in 2018 from La Sapienza, Università di Roma (Italy) and Université Paris-Sud (France) through a joint program with DIAG A. Ruberti (La Sapienza, Università di Roma) under the supervision of Salvatore Monaco and Dorothee Normand-Cyrot. In 2019, he received the SIDRA Award for the best Italian PhD thesis in Automatica; he was finalist for the *Prix des Meilleures Thèses du GDR MACS et de la Section Automatique du Club EEA*. His research is mainly concerned with hybrid systems, networked systems and nonlinear systems under sampling and time-delays.

September, 2020–Present **Assistant Professor (Ricercatore a Tempo Determinato di Tipo a)**, *Dipartimento di Ingegneria Informatica, Automatica e Gestionale A. Ruberti – Università degli Studi di Roma La Sapienza*.

## Titles and Education

January, 2020 **Qualification as Information Engineer professionalist.**

October, 2019 **Cultore della Materia for Teoria dei Sistemi (Laurea in Ingegneria Informatica e Automatica) and Nonlinear Systems and Control (Laurea Magistrale in Ingegneria Automatica)**, *Dipartimento di Ingegneria Informatica, Automatica e Gestionale A. Ruberti – Università degli Studi di Roma La Sapienza*.

2015–2018 **PhD in Automatica**, *Université Paris-Saclay, Paris (France)*, with Honours.

2015–2018 **PhD in Automatica, Bioingegneria e Ricerca Operativa**, *Università degli Studi di Roma La Sapienza, Rome (IT)*, cum Laude.  
Doctor Europaeus

2014–2015 **Master de Recherche en Automatique, Traitement du Signal et des Images**, *Université Paris Sud, Orsay (France)*, double degree program STIC&A.  
First Class Honours

2013–2015 **Masters of Science in Control Engineering**, *Università degli Studi di Roma La Sapienza, Rome (Italy), 110/110 cum Laude.*

2009–2012 **Bachelor of Science in Computer and Control Engineering**, *Università degli Studi di Roma La Sapienza, Rome (Italy), 110/110 cum Laude.*

#### PhD Schools

2017 **Energy-based modeling and control of physical systems**, *EECI International Graduate School on Control, 21 hours (5 ECTS)*, Instructors: Arjan van der Schaft and Dimitri Jeltsema.

2016 **Time-delay, sampled-data and PDE systems**, *EECI International Graduate School on Control, 21 hours (5 ECTS)*, Instructor: Emilia Fridman.

2015 **Local methods for nonlinear systems and control**, *EECI International Graduate School on Control, 21 hours (5 ECTS)*, Instructor: Rodolphe Sepulchre.

2015 **Distributed control and computation**, *EECI International Graduate School on Control, 21 hours (5 ECTS)*, Instructor: A. Stephen Morse.

2015 **Hybrid Systems: modeling, stability, robustness and the math behind it**, *EECI International Graduate School on Control, 21 hours (5 ECTS)*, 21 hours (5 ECTS). Instructor: Rafal K. Goebel.

#### PhD Thesis

Title *Stabilization of nonlinear cascaded systems under sampling and delays*

Supervisors Dr. Dorothée Normand-Cyrot & Prof. Salvatore Monaco

**Double degree program STIC&A**, *Laboratoire des Signaux et Systèmes (L2S, CNRS) and Dipartimento di Ingegneria Informatica, Automatica e Gestionale A. Ruberti (DIAG, Università degli Studi di Roma La Sapienza).*

Defense **May, 25th 2018**, *L2S, Université Paris-Saclay.*

**November, 2nd 2018**, *DIAG, Università degli Studi di Roma La Sapienza.*

#### Masters Thesis

Title *Control of nonlinear sampled-data systems: an Immersion and Invariance approach*

Supervisors Prof. Salvatore Monaco & Dr. Dorothée Normand-Cyrot

#### Bachelor Thesis

Title *Concezione e progetto di un sensore per il controllo dell'orientamento della vela solare*

Supervisor Prof. Salvatore Monaco

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### Scientific Community

2021 **6th IFAC Hybrid Conference on Analysis and Control of Chaotic Systems**, *International Program Committee Member.*

2020–present **IFAC Technical Committee on Non-Linear Control Systems**, *Corresponding Member.*

2020–present **Frontiers in Control Engineering**, *Associate Reviewer.*

2015–2019 **IEEE-CSS**, *Member.*

2015–present **Peer to peer anonymous reviewer**, *IEEE Transactions on Automatic Control*, *IEEE L-CSS Letters*, *IEEE Robotics and Automation Letters*, *IMA Journal of Mathematical Control and Information*, *Applied Mathematics and Computation*, *IEEE Conference on Decision and Control (2015 to present)*, *American Control Conference (2015 to present)*, *Mediterranean Control Conference*, *ICSTCC 2018*, *20th IFAC World Congress*, *IFAC CHAOS 2018*, etc.

2015–2018 **IEEE-CSS**, *Student Member*.

## Teaching activity

2021–present **Fondamenti di Automatica I**, 6 ECTS, Laurea in Ingegneria dell'Informazione (Università *La Sapienza* di Roma).

2020–present **Advanced Methods in Control**, 3 ECTS, Laurea Magistrale in Ingegneria Automatica (Università *La Sapienza* di Roma).

2020–present **Applicazioni dell'Automatica – Controllo dei Sistemi Aerospaziali**, 2 ECTS, Laurea in Ingegneria Informatica e Automatica (Università *La Sapienza* di Roma).

2020– 2021 **Fondamenti di Automatica**, 3 ECTS, Laurea in Ingegneria Elettronica (Università *La Sapienza* di Roma).

Tutoring and Teaching Assistant

2018–2020 **Control Systems, Tutor**, 9 ECTS, Laurea Magistrale in Ingegneria Aeronautica e della Laurea Magistrale in Ingegneria Spaziale ed Astronautica (Università *La Sapienza* di Roma), 90 hours per year.

2018–2020 **Teoria dei Sistemi, Teaching Assistant**, 9 ECTS, Laurea in Ingegneria Informatica e Automatica (Università *La Sapienza* di Roma), 24 hours per year.

2015–2020 **Nonlinear Systems and Control, Teaching Assistant**, 12 ECTS, Laurea Magistrale in Ingegneria Automatica (Università *La Sapienza* di Roma), 24 hours per year.

2015–2018 **Teoria dei Sistemi, Teaching Assistant**, 6 ECTS, Laurea in Ingegneria Informatica e Automatica (Università *La Sapienza* di Roma), 18 hours per year.

## Awards

2019 **SIDRA Award for the best PhD thesis in Automatica**, (*webpage*).

2019 **Prix des Meilleures Thèses du GDR MACS et de la Section Automatique du Club EEA**. Nominated for the best thesis presented in a french institute on Automation and Control Theory, (*webpage*).

2015 **Student Honor Program**. MSc in Control Engineering (Università degli Studi di Roma *La Sapienza*).

## Scholarship & fundings

2016 **IEEE CSS Student Support Program** for the 55th IEEE Conference on Decision and Control, Las Vegas (USA), 2016.

2016 **ED STIC**, Université Paris Saclay. Scholarship for international Mobility

- 2016 *Vinci Scholarship*, Université Franco-Italienne/Università Italo-Francese for international Mobility
- 2015 *I-CODE Institute Scholarship* for for internship activity

## Research Experience

- September, 2020–Present **Assistant Professor**, *Dipartimento di Ingegneria Informatica, Automatica e Gestionale A. Ruberti – Università degli Studi di Roma La Sapienza.*
- September, 2018–August 2020 **Assegnista di Ricerca (Post-Doctoral Fellow)**, *Dipartimento di Ingegneria Informatica, Automatica e Gestionale A. Ruberti – Università degli Studi di Roma La Sapienza.*
- June, 2019–September 2020 **Visiting Researcher**, *L2S (CNRS UMR 8509)-CentraleSupélec*, Gif-sur-Yvette (France), Stabilization of nonlinear systems under sampling.
- 2014–2015 **Intern**, *L2S (CNRS UMR 8509)*, Gif-sur-Yvette (France), Stabilization of nonlinear systems under sampling.
- Participation in National and International Research Projects
- 2019–2022 **Progetto di sistemi su reti in presenza di rumori, ritardi e perdite di pacchetto**, *Principal Investigator: S. Battilotti (DIAG, Università degli Studi di Roma La Sapienza)*, Progetti di Ricerca Università degli Studi di Roma La Sapienza.
- 2019–2020 **Robust stabilization of Nonlinear systems under sampling**, *Principal Investigator: D. Normand-Cyrot (L2S, CNRS)*, Partenaires: DIAG–Università degli Studi di Roma La Sapienza (Rome, Italy) and Equipe Projet INRIA DISCO (Saclay, France)., Appel à Projets Emergents – Dept STIC Paris-Saclay.
- 2018–2021 **Controllo di sistemi in rete: problemi collegati alle caratteristiche del grafo e al campionamento dei segnali.**, *Principal Investigator: S. Monaco (DIAG, Università degli Studi di Roma La Sapienza)*, Partenaires: L2S–CNRS (Gif-Sur-Yvette, France), Progetti di Ricerca Università degli Studi di Roma La Sapienza.
- 2018–2019 **Complex systems over networks and under delays**, *Principal Investigators: S. Monaco (DIAG, Università degli Studi di Roma La Sapienza) and D. Normand-Cyrot (L2S, CNRS)*, Partenaires: L2S–CNRS (Gif-Sur-Yvette, France), Chapter IV of Programme VINCI – Université UFI/UIF.
- 2016–2019 **Sistemi non lineari a tempo discreto e a segnali campionati**, *Principal Investigator: S. Monaco (DIAG, Università degli Studi di Roma La Sapienza)*, Partenaires: L2S–CNRS (Gif-Sur-Yvette, France), Progetti di Ricerca Università degli Studi di Roma La Sapienza.
- 2015–2018 **Discrete-time passivity-based control with application to blast furnaces processes**, *Principal Investigator: D. Normand-Cyrot (L2S, CNRS)*, with Prof. Chuanhou Gao Department of Mathematics, Zhejiang University (ZU, China), CNRS INS2I-NSFC PRC.

## ■ Seminars, Presentations and Invited talks

- 2021 *Feedforwarding for nonlinear discrete-time and sampled-data systems*. Seminar at CNRS, LAGEPP, Université de Lyon (France). April 26th, 2021.
- 2021 American Control Conference (New Orleans, USA). Oral presentation (virtual format).
- 2020 IEEE 59th Conference on Decision and Control (Jeju Island, Republic of Korea). Oral presentation (virtual format).
- 2019 IEEE 58th Conference on Decision and Control (Nice, France). Oral presentation.
- 2017 IEEE 56th Conference on Decision and Control (Melbourne, Australia). Oral presentation.
- 2017 20th IFAC World Congress (Toulouse, France). Oral presentation.
- 2016 IEEE 55th Conference on Decision and Control (Las Vegas, USA). Oral presentation.
- 2016 American Control Conference (Boston, USA). Oral presentation.
- 2015 IEEE 54th Conference on Decision and Control (Osaka, Japan). Oral presentation.

## ■ List of publications

### Journal Papers

- [J1] M. Mattioni and S. Monaco, "Cluster partitioning of heterogeneous multi-agent systems," *Automatica*, vol. 138, p. 110–136, 2022, ISSN: 0005-1098. DOI: <https://doi.org/10.1016/j.automatica.2021.110136>.
- [J2] F. Cacace, M. Mattioni, S. Monaco, and L. Ricciardi Celsi, "Topology-induced containment for general linear systems on weakly connected digraphs," *Automatica*, vol. 131, p. 109–134, 2021, ISSN: 0005-1098. DOI: <https://doi.org/10.1016/j.automatica.2021.109734>.
- [J3] A. Cristofaro and M. Mattioni, "Hybrid consensus for multi-agent systems with time-driven jumps," *Nonlinear Analysis: Hybrid Systems*, vol. 43, p. 101–113, 2021.
- [J4] A. Moreschini, M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Stabilization of discrete port-hamiltonian dynamics via interconnection and damping assignment," *IEEE Control Systems Letters*, vol. 5, no. 1, pp. 103–108, 2021, with CDC Option.
- [J5] M. Mattioni, "On multiconsensus of multi-agent systems under aperiodic and asynchronous sampling," *IEEE Control Systems Letters*, vol. 4, no. 4, pp. 839–844, 2020.
- [J6] M. Mattioni, S. Monaco, and D. Normand-Cyrot, "IDA-PBC for LTI dynamics under input delays: a reduction approach," *IEEE Control Systems Letters*, vol. 5, no. 4, pp. 1465–1470, 2020, with ACC Option.
- [J7] M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Feedforwarding under sampling," *IEEE Transactions on Automatic Control*, vol. 64, no. 11, pp. 4668–4675, Nov. 2019, ISSN: 2334-3303. DOI: 10.1109/TAC.2019.2902666.
- [J8] M. Mattioni, M. Hassan, S. Monaco, and D. Normand-Cyrot, "On partially minimum-phase systems and disturbance decoupling with stability," *Nonlinear Dynamics*, May 2019, ISSN: 1573-269X. DOI: 10.1007/s11071-019-04999-3. [Online]. Available: <https://doi.org/10.1007/s11071-019-04999-3>.

- [J9] M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Forwarding stabilization in discrete time," *Automatica*, vol. 109, p. 108532, 2019, ISSN: 0005-1098. DOI: <https://doi.org/10.1016/j.automatica.2019.108532>. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S0005109819303930>.
- [J10] —, "On the zero-dynamics of a class of hybrid lti systems: A geometric approach," *IEEE Control Systems Letters*, vol. 3, no. 3, pp. 703–708, 2019.
- [J11] M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Reduction of discrete-time two-channel delayed systems," *IEEE Control Systems Letters*, vol. 2, no. 3, pp. 339–344, Jul. 2018, with CDC Option, ISSN: 2475-1456. DOI: 10.1109/LCSYS.2018.2837881.
- [J12] M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Nonlinear discrete-time systems with delayed control: A reduction," *Systems & Control Letters*, vol. 114, pp. 31–37, 2018.
- [J13] —, "Immersion and invariance stabilization of strict-feedback dynamics under sampling," *Automatica*, vol. 76, pp. 78–86, 2017.
- [J14] M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Sampled-data reduction of nonlinear input-delayed dynamics," *IEEE Control Systems Letters*, vol. 1, no. 1, pp. 116–121, 2017, with CDC Option.
- [J15] S. Monaco, D. Normand-Cyrot, and M. Mattioni, "Sampled-data stabilization of nonlinear dynamics with input delays through immersion and invariance," *IEEE Transactions on Automatic Control*, vol. 62, no. 5, pp. 2561–2567, 2017.

#### Book Chapters

- [B1] S. Monaco, D. Normand-Cyrot, and M. Mattioni, "Nonlinear sampled-data stabilization with delays," in *Delays and Interconnections: Methodology, Algorithms and Applications*, G. Valmorbida, A. Seuret, I. Boussaada, and R. Sipahi, Eds. Cham: Springer International Publishing, 2019, pp. 299–315, ISBN: 978-3-030-11554-8. DOI: 10.1007/978-3-030-11554-8\_19. [Online]. Available: [https://doi.org/10.1007/978-3-030-11554-8\\_19](https://doi.org/10.1007/978-3-030-11554-8_19).

#### Conference Papers

- [C1] M. Elobaid, M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Digital path-following for a car-like robot.," 21, Control Conference Africa CCA 2021, vol. 54, 2021, pp. 174–179.
- [C2] M. Mattioni, A. Moreschini, S. Monaco, and D. Normand-Cyrot, "On feedback passivation under sampling," in *2021 American Control Conference (ACC)*, 2021, pp. 3578–3583.
- [C3] M. Elobaid, M. Mattioni, S. Monaco, and D. Normand-Cyrot, "On stable right-inversion of non-minimum-phase systems," in *58th IEEE Conference on Decision and Control*, 2020.
- [C4] —, "Sampled-data tracking under model predictive control and multi-rate planning," in *IFAC 2020 World Congress*, Jul. 2020.
- [C5] A. Moreschini, M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Reduction-based stabilization of nonlinear discrete-time systems through delayed state measurements," in *IFAC 2020 World Congress*, Elsevier, Jul. 2020.
- [C6] M. Elobaid, M. Mattioni, S. Monaco, and D. Normand-Cyrot, "On unconstrained mpc through multirate sampling," in *11th IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, vol. 52, Elsevier, Sep. 2019, pp. 388–393.

- [C7] A. Moreschini, M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Discrete port-controlled hamiltonian dynamics and average passivation," in *2019 IEEE 58th Conference on Decision and Control (CDC)*, 2019, pp. 1430–1435.
- [C8] —, "Interconnection through u-average passivity in discrete time," in *2019 IEEE 58th Conference on Decision and Control (CDC)*, 2019, pp. 4234–4239.
- [C9] M. Mattioni, M. Hassan, S. Monaco, and D. Normand-Cyrot, "On partially minimum-phase systems and nonlinear sampled-data control," in *Decision and Control (CDC), 2017 IEEE 56th Annual Conference on*, 2018, pp. 6101–6106.
- [C10] M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Lyapunov stabilization of discrete-time feedforward dynamics," in *Decision and Control (CDC), 2017 IEEE 56th Conference on*, 2018, pp. 4272–4277.
- [C11] —, "Reduction-based stabilization of time-delay systems," in *Decision and Control (CDC), 2018 IEEE 57th Annual Conference on*, 2018.
- [C12] —, "Further results on sampled-data stabilization of time-delay systems," in *20th IFAC World Congress*, vol. 50, Elsevier, Jul. 2017, pp. 14 350–14 355.
- [C13] —, "Sampled-data stabilization of feedforward dynamics with lyapunov cross-term," in *Decision and Control (CDC), 2016 IEEE 55th Conference on*, IEEE, 2016, pp. 1322–1327.
- [C14] S. Monaco, D. Normand-Cyrot, and M. Mattioni, "Stabilization of feedforward discrete-time dynamics through immersion and invariance," in *American Control Conference (ACC), 2016*, IEEE, 2016, pp. 264–269.
- [C15] M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Digital stabilization of strict feedback dynamics through immersion and invariance," in *1st IFAC conference on Modelling, Identification and Control of Nonlinear Systems. IFAC-PapersOnLine*, Elsevier, vol. 48, 2015, pp. 1074–1079.
- [C16] —, "Sampled-data stabilisation of a class of state-delayed nonlinear dynamics," in *Decision and Control (CDC), 2015 IEEE 54th Annual Conference on*, IEEE, 2015, pp. 5695–5700.

#### Submitted Papers

- [1] F. Cacace, M. Mattioni, S. Monaco, and L. Ricciardi Celsi, "Output containment design for heterogeneous linear systems on general unweighted digraphs," Submitted to *Automatica*, Jul. 2021.
- [2] M. Elobaid, M. Mattioni, S. Monaco, and D. Normand-Cyrot, "Station-keeping of  $L_2$  halo orbits under sampled-data model predictive control," Submitted to *Journal of Guidance, Control and Dynamics*, Jul. 2021.
- [3] —, "Virtual Holonomic Constraints for Euler-Lagrange Systems under sampling," Submitted to *European Control Conference (ECC)*, Nov. 2021.
- [4] M. Mattioni, S. Monaco, and D. Normand-Cyrot, "A new connection protocol for multi-consensus of discrete-time systems," Submitted to *American Control Conference (ACC)*, Sep. 2021.
- [5] M. Mattioni, A. Moreschini, S. Monaco, and D. Normand-Cyrot, "Stabilization of the acrobot via sampled-data passivity-based control," Submitted to *European Control Conference (ECC)*, Nov. 2021.

- [6] M. Mattioni, A. Moreschini, S. Monaco, and D. Normand-Cyrot, "Discrete-time energy-balance passivity-based control," Submitted to *Automatica*, Feb. 2021.
- [7] S. Monaco, D. Normand-Cyrot, M. Mattioni, and A. Moreschini, "Nonlinear Hamiltonian systems under sampling," Submitted to *IEEE Transactions on Automatic Control*, Jan. 2021.

## Computer skills

Intermediate MATLAB&SIMULINK, JAVA,C/C++, PYTHON, L<sup>A</sup>T<sub>E</sub>X, OpenOffice, Linux, Microsoft Windows

## Languages

Italian	<b>Mothertongue</b>	
English	<b>C2</b>	<i>Con conversationally fluent</i>
French	<b>C2</b>	<i>Con conversationally fluent</i>
Spanish	<b>C2</b>	<i>Con conversationally fluent</i>

## Web

Google Scholar **UMSIThcAAAAJ.**

Orcid **0000-0002-9407-7521.**

Scopus **57045864900.**

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