Massimiliano d'Angelo

Personal Information

First Name Massimiliano Surname d'Angelo

National Scientific Habilitation (ASN)

November 2023 National Scientific Habilitation for Associate Professor - ING-INF/04.

PhD & Post-Doctoral positions

February 2023 – in progress	Postdoc researcher at the Consiglio Nazionale delle Ricerche (CNR), Istituto di Analisi dei Sistemi e di Informatica "A. Ruberti", Rome, Italy. Progetto MISE Liver's Alive – Accordo Innovazione Scienze della vita DM 05/03/2018 Bando "Fabbrica intelligente, Agrifood e Scienze della vita" (2022-2026). Topics. Systems and synthetic biology; biomedicine; distributed filtering and control; consensus problems for infinite-dimensional systems.
January 2023 – March 2023	Visiting researcher at the Dependable Control and Decision Group, École poly- technique fédérale de Lausanne (EPFL), Lausanne, Switzerland. Topics. Neural ODE; Universal approximation results for Neural ODE.
February 2022 – January 2023	Postdoc researcher at the Department of Computer, Control and Management Engineering, A. Ruberti, Sapienza University of Rome, Italy. Topics. Distributed filtering and distributed control for cyber-physical systems; leader-following consensus with delays; systems biology.
January 2021 – December 2021	Postdoc researcher at the Department of Biotechnology and Biosciences at the University of Milano-Bicocca, Milan, Italy. Topics. Systems and Synthetic Biology: Chemical Reaction Networks, Whole-cell-models, Riboso- me assembly. This work has been done with the collaboration of the Joint Research Unit ISBE-it.
November 2019 – October 2020	Postdoc researcher at the Department of Computer, Control and Management Engineering, A. Ruberti, Sapienza University of Rome, Italy. Topics. Distributed filtering and distributed optimal control; filtering and control of time-delay systems.
January 2019 – May 2019	Visiting student at the Washington University in St. Louis, St. Louis, USA. topics: resilient estimation for cyber-physical systems; sub-optimal filtering and control of non-Gaussian systems in presence of packet data losses. Supervisor: Prof. Bruno Sinopoli.
November 2016 – October 2019)	 Ph.D. Student at the Department of Computer, Control and Management Engineering, A. Ruberti, at Sapienza University of Rome, Italy. Ph.D. Thesis: LQ Regulators and detection problems in non-Gaussian environments. Dissertation date: February 21, 2020. Supervisor: Prof. Stefano Battilotti. Final mark: with honors.

Education

October 2014	Master's degree in Control Engineering, Sapienza University of Rome, Italy.
– October 2016	Thesis: Optimal Quadratic Control for Stochastic Non-Gaussian Linear Systems via Output
	Advisors: Prof. Stefano Battilotti (Sapienza University of Rome) and Prof. Alfredo Germani (L'Aquila University). Final mark: 110 cum laude.
March 2016	Student Honor Program in Control Engineering.
– October 2016	Topic: Stochastic Stability of Differential Equations. Tutor: Prof. Stefano Battilotti.
September 2015	Erasmus at the Math Department of the University of Nice Sophia Antipolis,
– February 2016	France.
	Teachers: Prot. Cédric Bernardin, Prot. François Delarue, Prot. Jacques Blum.
October 2011 – July 2014	Bachelor's degree in Industrial Engineering, Università Campus Biomedico di Ro- ma, Italy.
	Thesis: Analysis and Identification of a Stochastic Lotka-Volterra Model.
	Advisor: Prof. Marco Papi. Final mark: 110 cum lauda
September 2006 – June 2011	High school leaving qualification in scientific studies, Liceo Scientifico "Federico II di Svevia", Melfi, Italy.

Skills

Scientific Programs and Languages: Latex, Matlab, Simulink, Labview, C++.

Language Skills: very good spoken and written English; good command in French.

Personal Skills: determinate, cooperative and highly motivated.

Technical competences

Stochastic systems; optimal control; non-Gaussian systems; time-delay systems; filtering; estimation; networks and communication systems; distributed filtering; stochastic optimal control; distributed control; leader-following consensus; systems biology

Awards/invited talks /seminars

October 2016 Student Honor in the Master degree in Control Engineering.

- 19 September 2018 **Talk "Non-Gaussian filtering and control"**, at the Department of Computer, Control and Management Engineering, A. Ruberti, Sapienza University of Rome, Italy. «Identification and optimal control, bioengineering, network traffic management at DIAG, from the roots towards the future, a workshop in memory of Carlo Bruni».
- 16 September 2022 **Seminar "Topics on filtering and optimal control for linear systems: non-Gaussian noise and sensor networks"**, at the DECODE (Dependable Control and Decision) Lab, EPFL (École Polytechnique Fédérale de Lausanne), Lousanne, Swiss..

Participations to research projects

September 2017 – August 2018	Stima dello stato e rilevazione di guasti per sistemi con ritardi (State estimation and fault detection for time-delay systems). Progetto Sapienza. Pl: Stefano Battilotti. n. RP11715C539237AE.
September 2018 – August 2019	Modellizzazione e controllo del sistema glicemia-insulina in pazienti con diabete di tipo I (Modeling and control of the insulin-glucose system for type 1 diabetes). Progetto Sapienza. Pl: Claudia Califano. n. RP1181643602CB61.
February 2023 – in progress	Progetto MISE Liver's Alive – Accordo Innovazione Scienze della vita DM 05/03/2018 Bando "Fabbrica intelligente, Agrifood e Scienze della vita" (2022- 2026). Partner: CNR-IASI. Responsabile: Alessandro Borri.

Reviewer for Journals

- IEEE Transactions on Automatic Control.
- Automatica.
- International Journal of Robust and Nonlinear Control.
- American Mathematical Society journals.
- IEEE Transactions on Cybernetics.
- European Journal of Control.
- IEEE/CAA Journal of Automatica Sinica.

Editorial activities

May 2023 Associate editor of the journal Optimal Control Applications and Methods.

- in progress Edited By: Mike J. Grimble
 2023 CiteScore (Scopus): 3.9
 2023 Journal Citation Indicator (Clarivate): 0.58
 2023 Journal Impact Factor (Clarivate): 2
 Journal Citation Reports (Clarivate, 2022): 46/65 (Automation & Control Systems) 82/267 (Mathematics, Applied) 61/87 (Operations Research & Management Science)
 Online ISSN:1099-1514
 John Wiley & Sons Ltd.
- May 8, 2024 Organizer and Guest editor for the Special Issue in Int. Journal of Robust and Nonlinear Control: "Time-delay systems: recent trends and applications". Co-organized with Silviu Niculescu, Vittorio De Iuliis, Costanzo Manes and Pierdomenico Pepe. https://doi.org/10.1002/rnc.7403.
 - May 2023 Associate editor for the IEEE Conference on Control Technology and Applications
- in progress (CCTA) member of the Technology Conference Editorial Board (TCEB). Chair: Stefano di Cairano
- May 2024 Associate editor for the IEEE American Control Conference and IEEE Conference - in progress on Decision and Control - member of the Conference Editorial Board (CEB). Chair: Amir Aghdam
- February 2021 Member of the Technical Committee Networks and Communication Systems of - in progress the IEEE Control Systems Society.

Chair: Giacomo Como, Politecnico di Torino; e-mail: giacomo.como@polito.it Mission statement: There has been an increasing volume of research on networks within the CSS community. This research is not confined to work on traditional communication networks, but also extends to a broader set of networks including other technological networks such as transportation and energy networks, social, economic, and financial networks, and biological networks.

May 2022 Member of the Technical Committee 2.4 *Optimal Control* of the International – in progress Federation of Automatic Control (IFAC).

Chair: Eric Kerrigan; e-mail: e.kerrigan@imperial.ac.uk Mission statement: The development and application of theory and methods for solving optimal control and planning problems, the development of numerical optimization methods, as well as the closed-loop implementation of optimal controllers on real-time computer systems and networked architectures. Particular methods include, but are not limited to, the calculus of variations, Pontryagin's maximum principle, dynamic programming, model predictive control, optimization-based estimation, and differential games. Control methodologies can be based on first-principles models, data-driven models or a combination of both.

September 2022 European Control Conference 2023 (ECC23), 13–16 June Bucharest, Romania. – December 2023 Associate editor.

September 2023 European Control Conference 2024 (ECC24), 25–28 June Stockholm, Sweden.

- December 2023 Associate editor.
 - TBD European Control Conference 2025 (ECC25), 24–27 June Thessaloniki, Greece. Associate editor.

September 2022 9th edition in the series of the International Conference on Control, Decision and - July 2023 Information Technologies (CoDIT'23), 3–6 July 2023, Rome, Italy.

"Work in Progress" program co-chair Local Arrangement Committee co-Chair Associate editor Member of the IPC

Invited/special session organization

Invited session organization at the 61st IEEE Conference on Decision and Control - Dec. 6-9, 2022, in Cancún, Mexico.

Title: *Stability and stabilization of Time-Delay Systems: recent trends and applications.* Organizers: Massimiliano d'Angelo, Vittorio De Iuliis, Costanzo Manes, Pierdomenico Pepe.

Invited session organization at the 61st IEEE Conference on Decision and Control - Dec. 6-9, 2022, in Cancún, Mexico.

Title: *Systems and Synthetic Biology.* Organizers: Massimiliano d'Angelo, Pasquale Palumbo, Abhyudai Singh.

Teaching and Tutoring activities *

October 2017 – October 2018	Assistant lecturer for the course "Control Systems" (SSD ING-INF/04) - 90h. Prof. in charge: Stefano Battilotti. Astronautical Engineering, Sapienza University of Rome (Italy).
October 2017 – December 2017	Assistant lecturer for the course "Probabilità e Statistica per l'Ingegneria" (Pro- bability and Statistics for Engineering, SSD ING-INF/04) - 20h. Prof. in charge: Filippo Cacace. Ingegneria Industriale, Campus Bio-Medico di Roma (Italy).
September 2018 – December 2018	Assistant lecturer for the course "Analisi I" (Calculus I, SSD MAT/05) - 30h. Prof. in charge: Roberto Lucchetti. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).
September 2019 – December 2019	Assistant lecturer for the course "Probability" (SSD MAT/06) - 30h. Prof. in charge: Sara Biagini. Master in Finance, LUISS, Rome (Italy).
December 2019 – July 2020	Assistant lecturer for the course "System Identification and Optimal Control" (SSD ING-INF/04) - 40h. Prof. in charge: Stefano Battilotti. Master of Science in Control Engineering, Sapienza University of Rome, Rome (Italy).
February 2019 – May 2019	Assistant lecturer for the course "Probabilità e Statistica per l'Ingegneria" (Pro- bability and Statistics for Engineering, SSD ING-INF/04) - 20h. Prof. in charge: Filippo Cacace. Ingegneria Industriale, Campus Bio-Medico di Roma, Rome (Italy).
September 2020 – December 2020	Assistant lecturer for the course "Algebra e Geometria" (Algebra and Geometry, SSD MAT/03) - 45h. Prof. in charge: Roberto Lucchetti. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).
September 2020 – December 2020 September 2020 – December 2020	Assistant lecturer for the course "Algebra e Geometria" (Algebra and Geometry, SSD MAT/03) - 45h. Prof. in charge: Roberto Lucchetti. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome). Assistant lecturer for the course "Probability" (SSD MAT/06) - 20h. Prof. in charge: Sara Biagini. Master in Finance, LUISS, Rome (Italy).
September 2020 – December 2020 – December 2020 – December 2020 February 2021 – May 2021	Assistant lecturer for the course "Algebra e Geometria" (Algebra and Geometry, SSD MAT/03) - 45h. Prof. in charge: Roberto Lucchetti. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome). Assistant lecturer for the course "Probability" (SSD MAT/06) - 20h. Prof. in charge: Sara Biagini. Master in Finance, LUISS, Rome (Italy). Assistant lecturer for the course "Probabilità e Statistica" (Probability and Stati- stics, SSD MAT/06) - 37h. Prof. in charge: Elio Piazza. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).
September 2020 – December 2020 – December 2020 – December 2020 February 2021 – May 2021 – May 2021	Assistant lecturer for the course "Algebra e Geometria" (Algebra and Geometry, SSD MAT/03) - 45h. Prof. in charge: Roberto Lucchetti. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome). Assistant lecturer for the course "Probability" (SSD MAT/06) - 20h. Prof. in charge: Sara Biagini. Master in Finance, LUISS, Rome (Italy). Assistant lecturer for the course "Probabilità e Statistica" (Probability and Stati- stics, SSD MAT/06) - 37h. Prof. in charge: Elio Piazza. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome). Assistant lecturer for the course "Probabilità e Statistica per l'Ingegneria" (Pro- bability and Statistics for Engineering, SSD ING-INF/04) - 20h. Prof. in charge: Filippo Cacace. Ingegneria Industriale, Campus Bio-Medico di Roma, Rome (Italy).
September 2020 – December 2020 – December 2020 – December 2020 February 2021 – May 2021 – May 2021 September 2021 – December 2021	Assistant lecturer for the course "Algebra e Geometria" (Algebra and Geometry, SSD MAT/03) - 45h. Prof. in charge: Roberto Lucchetti. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome). Assistant lecturer for the course "Probability" (SSD MAT/06) - 20h. Prof. in charge: Sara Biagini. Master in Finance, LUISS, Rome (Italy). Assistant lecturer for the course "Probabilità e Statistica" (Probability and Stati- stics, SSD MAT/06) - 37h. Prof. in charge: Elio Piazza. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome). Assistant lecturer for the course "Probabilità e Statistica per l'Ingegneria" (Pro- bability and Statistics for Engineering, SSD ING-INF/04) - 20h. Prof. in charge: Filippo Cacace. Ingegneria Industriale, Campus Bio-Medico di Roma, Rome (Italy). Assistant lecturer for the course "Algebra e Geometria" (Algebra and Geometry, SSD MAT/03) - 46h. Prof. in charge: Roberto Lucchetti. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).

January 2022 – December 2022	Assistant lecturer for the course "Control Systems" (SSD ING-INF/04) - 40h. Prof. in charge: Stefano Battilotti. Astronautical Engineering, Sapienza University of Rome (Italy).
February 2022 – May 2022	Assistant lecturer for the course "Probabilità e Statistica per l'Ingegneria" (Pro- bability and Statistics for Engineering, SSD ING-INF/04) - 20h. Prof. in charge: Filippo Cacace. Ingegneria Industriale, Campus Bio-Medico di Roma, Rome (Italy).
September 2022 – December 2022	Assistant lecturer for the course "Algebra e Geometria" (Algebra and Geometry, SSD MAT/03) - 45h. Prof. in charge: Roberto Lucchetti. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).
February 2023 – May 2023	Assistant lecturer for the course "Probabilità e Statistica per l'Ingegneria" (Pro- bability and Statistics for Engineering, SSD ING-INF/04) - 20h. Prof. in charge: Filippo Cacace. Ingegneria Industriale, Campus Bio-Medico di Roma, Rome (Italy).
September 2023 – December 2023	Assistant lecturer for the course "Fondamenti di Automatica" (Control Systems, SSD ING-INF/04) - 44h. Prof. in charge: Fabio della Rossa. Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).
September 2023 – December 2023	Assistant lecturer for the course "Probabilità e Applicazioni alla Finanza" (SSD MAT/06) - 12h. Prof. in charge: Hlafo Alfie Mimun. Corso di Laurea Magistrale in Economia e Finanza, LUISS, Rome (Italy).
February 2024 – May 2024	Assistant lecturer for the course "Probabilità e Statistica per l'Ingegneria" (Pro- bability and Statistics for Engineering, SSD ING-INF/04) - 15h. Prof. in charge: Filippo Cacace. Ingegneria Industriale, Campus Bio-Medico di Roma, Rome (Italy).
September 2018 – in progress	Personal tutor for the bachelor in Industrial Engineering . Ingegneria Industriale, Campus Bio-Medico di Roma, Rome (Italy). Personal tutor activities is focused in helping students recognize their own potential, the resources available to them facilitating growth of their learning skills, and their ability to cope with responsibilities and difficulties. In particular, tutors accompany students through the entire period of their studies.

* the total number of hours for each activity should be understood as covering only *frontal* lectures and does not include office hours or exams.

Publications

- Battilotti, S., Cacace, F., d'Angelo, M., & Germani, A. (2017). An Improved Approach to the LQ non-Gaussian Regulator Problem. 20th IFAC World Congress 2017, Toulouse. IFAC-PapersOnLine, 50(1), 11808-11813.
- Battilotti, S., Cacace, F., d'Angelo, M., & Germani, A. (2018). Distributed Kalman Filtering over Sensor Networks with Unknown Random Link Failures. *IEEE Control* Systems Letters, 2(4), 587-592.
- Battilotti, S., Cacace, F., d'Angelo, M., & Germani, A. (2018). Cooperative Filtering with Absolute and Relative Measurements. In 2018 IEEE Conference on Decision and Control (CDC) (pp. 7182-7187), Miami Beach.
- Battilotti, S., Cacace, F., d'Angelo, M., & Germani, A. (2019). The Polynomial Approach to the LQ Non-Gaussian Regulator Problem Through Output Injection. *IEEE Transactions* on Automatic Control, 64(2), 538-552.
- Cacace, F., Conte, F., d'Angelo, M., & Germani, A. (2019). Feedback polynomial filtering and control of non-Gaussian linear time-varying systems. Systems & Control Letters, 123, 108-115.
- Battilotti, S., & d'Angelo, M. (2019). Delay-State Dynamics to Filtering Gaussian Systems with Markovian Delayed Measurements. In 2019 European Control Conference (ECC), Naples.
- Battilotti, S., Cacace, F., d'Angelo, M., Germani, A., & Sinopoli, B. (2019). LQ Non-Gaussian Regulator With Markovian Control. IEEE Control Systems Letters, 3(3), 679-684.
- Cacace, F., Conte, F., d'Angelo, M., & Germani, A. (2019). Filtering of systems with nonlinear measurements with an application to target tracking. *International Journal of Robust and Nonlinear Control*, 29(14), 4956-4970.
- Battilotti, S., & d'Angelo, M. (2019). Stochastic output delay identification of discrete-time Gaussian systems. Automatica, 109, 108499.
- Battilotti, S., Cacace, F., d'Angelo, M., Germani, A., Sinopoli, B. Kalman-like filtering with intermittent observations and non-Gaussian noise. 8th IFAC Workshop on Distributed Estimation and Control in Networked Systems, September 2019, Chicago.
- Battilotti, S., Cacace, F., d'Angelo, M., Germani, A., Sinopoli, B. LQ non-Gaussian Control with I/O packet losses. 2020 American Control Conference (ACC), Denver, Colorado.
- Battilotti, S., Cacace, F., d'Angelo, M. & Germani, A. (2019). Asymptotically optimal consensus-based distributed filtering of continuous-time linear systems. 21th IFAC World Congress 2020, Berlin. IFAC-PapersOnLine, to appear.
- Battilotti, S., Cacace, F., d'Angelo, M. & Germani, A. (2019). Asymptotically optimal consensus-based distributed filtering of continuous-time linear systems. *Automatica*, 122, 109189.
- Cacace, F., d'Angelo, M. & Germani, A. (2020). LTV stochastic systems stabilization with large and variable input delay. *Automatica*, 123, 109305.
- Battilotti, S., Cacace, F., & d'Angelo, M. (2020). Distributed infinite-horizon optimal control of continuous-time linear systems over network *International Journal of Robust and Nonlinear Control*, in the special issue on "Optimal Control and Learning for Cyber-Physical Systems".
- Battilotti, S., Cacace, F., & d'Angelo, M. (2021). A stability with optimality analysis of consensus-based distributed filters for discrete-time linear systems *Automatica*, 129, 109589.
- Cacace, F., d'Angelo, M., De Iuliis, V., & Germani, A. (2021). Filtering Discrete-Time Systems With Multiplicative Noise in L₂ Spaces With Applications. *IEEE Control Systems Letters*, 6, 734-739.
- d'Angelo, M., Palumbo, P., Busti, S. & Vanoni, M. (2021). Towards a molecular model of ribosome assembly. 61th SIB 2021 Congress. Virtual Edition.
- Cacace, F., Conte, F., d'Angelo, M., Germani, A., & Palombo, G. (2022). Filtering linear systems with large time-varying measurement delays. *Automatica*, 136, 110084.
- Borri, A., d'Angelo M., & Palumbo, P.(2022). Self-regulation in a stochastic model of chemical self-replication. International Journal of Robust and Nonlinear Control, DOI: 10.1002/rnc.6021, 136, 110084.

- Battilotti, S., Cacace, F., & d'Angelo, M. Distributed Infinite-Horizon Optimal Control of Discrete-Time Linear Systems over Sensor Networks. In 2022 IEEE 61st Conference on Decision and Control (CDC) (pp. 3953-3958). IEEE.
- O'Angelo, M., Palumbo, P., Busti, S. & Vanoni, M. A coarse-grain model for cellular growth accounting for ribosome synthesis. In 2022 IEEE 61st Conference on Decision and Control (CDC) (pp. 3859-3864). IEEE.
- Battilotti, S., Cacace, F., Califano, C., & d'Angelo, M. (2022). Stochastic Leader-Following for Heterogeneous Linear Agents with Communication Delays. *IEEE Transactions on Automatic Control.*. DOI: 10.1109/TAC.2022.3225133
- Battilotti, S., Cacace, F., Califano, C., & d'Angelo, M. (2022). Leader-following consensus with non-uniform and large communication delays. *IEEE Transactions on Control of Network Systems.*. DOI: 10.1109/TCNS.2023.3258625
- Cacace, F., d'Angelo, M., & Ricciardi Celsi, L. (2023). Stochastic predictor-based leaderfollowing control with input and communication delays. International Journal of Control, 96(10), 2611-2622.
- Zakwan, M., d'Angelo, M., & Ferrari-Trecate, G. (2023). Universal Approximation Property of Hamiltonian Deep Neural Networks. *IEEE Control System Letters*. DOI: 10.1109/LCSYS.2023.3288350.
- Battilotti, S., Cacace, F., & d'Angelo, M. (2023). Consensus analysis of random sub-graphs for distributed filtering with link failures. *IEEE Transactions on Automatic Control*.
- Battilotti, S., Cacace, F., & d'Angelo, M. (2023). Distributed optimal control of discretetime linear systems over networks. IEEE Transactions on Control of Network Systems.
- Borri A., d'Angelo M., D'Orsi L., Pompa M., Panunzi S., & De Gaetano A. (2024). Stochastic modeling of glioblastoma spread: a numerical simulation study. International Multidisciplinary Modeling & Simulation Multiconference 2024 - I3M 2024, to appear

Rome, August 7, 2024 .