Massimiliano d'Angelo

Personal Information

First Name Massimiliano
Surname d'Angelo

Post-Doctoral positions

February 2022 – in progress **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; 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, Ribosome assembly.
Specifically, the position is focused on the analysis and design of deterministic/stochastic models describing the dynamics of molecular processes of a cell and among cells. In particular, the primal goal is the one of constructing a "whole-cell model", namely an integrated model of the most important functions of the cell (such as metabolism, growth and cell cycle). Within this aim, the focus is the integration of a module regarding the ribosome-protein synthesis model and the ribosome 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.

Education

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.

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.

October 2014 – October 2016 **Master's degree in Control Engineering, Sapienza University of Rome, Italy**.
Thesis: Optimal Quadratic Control for Stochastic Non-Gaussian Linear Systems via Output Injection.
Advisors: Prof. Stefano Battilotti (Sapienza University of Rome) and Prof. Alfredo Germani (L'Aquila University).
Final mark: 110 cum laude.

March 2016 – October 2016 **Student Honor Program in Control Engineering**.
Topic: Stochastic Stability of Differential Equations.
Tutor: Prof. Stefano Battilotti.

September 2015 – February 2016 **Erasmus at the Math Department of the University of Nice Sophia Antipolis, France**.
Teachers: Prof. Cédric Bernardin, Prof. François Delarue, Prof. Jacques Blum.

October 2011 – July 2014 **Bachelor's degree in Industrial Engineering, Università Campus Biomedico di Roma, Italy**.
Thesis: Analysis and Identification of a Stochastic Lotka-Volterra Model.
Advisor: Prof. Marco Papi.
Final mark: 110 cum laude

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.

Awards and invited talks

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».

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)**.
PI: 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)**.
PI: Claudia Califano.
n. RP1181643602CB61.

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

February 2021 – in progress **Member of the Conference Editorial Board for the Technical Commettee *Networks and Communication Systems* of 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.

Technical competences

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

Teaching and Tutoring activities *

October 2017 – October 2018 **Assistant lecturer for the course "Control Systems" - 90h**.
Prof. in charge: Stefano Battilotti.
Astronautical Engineering, Sapienza University of Rome (Italy).

October 2017 – October 2018 **Assistant lecturer for the course "Probabilità e Statistica" (Probability and Statistics) - 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) - 30h**.
Prof. in charge: Roberto Lucchetti.
Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).

September 2019 – December 2020 **Assistant lecturer for the course "Probability" - 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" - 40h**.
Prof. in charge: Stefano Battilotti.
Master of Science in Control Engineering, Sapienza University of Rome, Rome (Italy).

February 2019 – September 2020 **Assistant lecturer for the course "Probabilità e Statistica" (Probability and Statistics) - 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) - 45h**.
Prof. in charge: Roberto Lucchetti.
Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).

September 2020 – December 2021 **Assistant lecturer for the course "Probability" - 20h**.
Prof. in charge: Sara Biagini.
Master in Finance, LUISS, Rome (Italy).

February 2021 – April 2021 **Assistant lecturer for the course "Probabilità e Statistica" (Probability and Statistics) - 37h**.
Prof. in charge: Elio Piazza.
Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).

February 2021 – May 2021 **Assistant lecturer for the course "Probabilità e Statistica" (Probability and Statistics) - 20h**.
Prof. in charge: Filippo Cacace.
Ingegneria Industriale, Campus Bio-Medico di Roma, Rome (Italy).

September 2021 – in progress **Assistant lecturer for the course "Algebra e Geometria" (Algebra and Geometry) - 46h****.
Prof. in charge: Roberto Lucchetti.
Ingegneria Informatica, Politecnico di Milano for ELIS Digital University (Rome).

September 2021 – in progress **Assistant lecturer for the course "Probability" - 28h****.
Prof. in charge: Sara Biagini.
Master in Finance, LUISS, 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 whole amount of hours for each activity has to be intended as *frontal* lectures.
** scheduled hours.

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 L_2 spaces with applications. *IEEE Control Systems Letters.*
- d'Angelo, M., Palumbo, P., Busti, S. & Vanoni, M. (2021). Towards a molecular model of ribosome assembly. 61^{th} *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.

Rome, January 2021 .