Ivano Notarnicola

Personal Details

Affiliation:	Department of Electrical, Electronic and Information Engineering "G. Marconi", Alma Mater Studiorum Università di Bologna, viale del Risorgimento 2, Bologna, 40136, Italy
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Languages:	Italian – mother tongue. English – written and spoken, fluent

Current Position

10 Jul 2023 – current	Senior Assistant Professor (RTD-B) Systems and Control Engineering Department of Electrical, Electronic and Information Engineering "G. Marconi", Alma Mater Studiorum Università di Bologna, Italy

Education

25 May 2018	Ph.D in Engineering of Complex Systems, Università del Salento, Lecce, Italy Summa cum laude *Advisor:* G. Notarstefano *Thesis:* Block-Coordinate Methods and Duality for Asynchronous, Big-Data and Constrained Distributed Optimization.
22 Jul 2014	Master degree in Computer Engineering (LM-32), Università del Salento, Lecce, Italy 110/110 cum laude. Gpa: 29.6/30.0 *Advisors:* G. Notarstefano, F. Allgöwer, F.A. Bayer *Thesis:* Numerical Methods for Final-State Constrained Optimal Control Problems.
18 Oct 2012	Bachelor degree in Information Engineering (L-08), Università del Salento, Lecce, Italy 110/110 cum laude. Gpa: 29.3/30.0 *Advisor:* G. Indiveri *Thesis:* Comparative Study of Kalman and Complementary Filters

Positions Held

Jul 2020 – Jul 2023	Junior Assistant Professor (RTD-A) Systems and Control Engineering Department of Electrical, Electronic and Information Engineering "G. Marconi", Alma Mater Studiorum Università di Bologna, Italy
Feb 2022 – Apr 2022	Visiting Researcher at Imperial College London (London, UK) *Advisor:* T. Parisini *Project:* Development of control-based analysis approaches for constrained optimization problems.
Dec 2018 – Jul 2020	Postdoctoral Researcher at Alma Mater Studiorum Università di Bologna (Bologna, IT) *Advisor:* G. Notarstefano

	Project: Distributed methods for large-scale optimization with application to control and learning in cyber-physical networks.
Dec 2017 – Nov 2018	Postdoctoral Researcher at Università del Salento (Lecce, IT) *Advisor:* G. Notarstefano *Project:* Development of distributed optimization methodologies with applications to learning and control.
Dec 2016 – Mar 2017	Research Scholar at Purdue University (West Lafayette, IN, USA) *Advisor:* G. Scutari *Project:* Investigation and development of distributed algorithms for nonconvex big-data optimization.
Mar 2014 – Jun 2014	Visiting MSc Student at University of Stuttgart (Stuttgart, Germany) *Advisor:* F. Allgöwer *Project:* Erasmus exchange for the final internship and the master thesis on numerical optimal control techniques for nonlinear systems.

Awards

17 Dec 2021	2021 IEEE Transactions on Control of Network Systems Outstanding Paper Award for the paper "Constraint-Coupled Distributed Optimization: a Relaxation and Duality Approach", I. Notarnicola, G. Notarstefano. International award given by the IEEE Control Systems Society for papers published in the IEEE Transactions on Control of Network Systems during the two calendar years preceding the year of the award. The basis for judging is originality, potential impact on the foundations of network systems, importance and practical significance in applications, and clarity. Link `ieeecss.org/awards/transactions-control-network-systems-outstanding-paper-award`
11 Sep 2020	Best Young Author Journal Paper Award 2020 for the paper "Constraint-Coupled Distributed Optimization: a Relaxation and Duality Approach", I. Notarnicola, G. Notarstefano. The motivation is: the paper proposes a novel iterative scheme for the solution of mixed-integer cooperative optimization problems, which extends the existing approaches to a distributed set-up with a time-varying communication network, so encompassing more realistic scenarios in optimal resource sharing problems. National award given by the Italy Chapter of the IEEE Control Systems Society to a young member (less than 35) of the Italian Chapter of the IEEE CSS. Link `http://www.ieeecss.it`
14 Sep 2018	Best Ph.D. Thesis in the field of Systems and Control Engineering for Doctoral Theses defended in the period June 1, 2017 – May 31, 2018. National award given every year by the Italian Society of Professors and Researchers in Automation (SIDRA) to two outstanding Ph.D. students from an Italian university. Link `www.automatica.it/premio-di-dottorato`
10 Dec 2017	Best Student Paper Award (3^{rd} place) for the paper "Distributed Big-Data Optimization via Block Communications", I. Notarnicola, Y. Sun, G. Scutari, G. Notarstefano. at the 7th IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP 2017), Curaçao, Dutch Antilles. International award given by the IEEE Signal Processing Society.

Editorial and Scientific Organization Activities

Jan 2023 – current	Associate Editor for the IEEE Control Systems Society Conference Editorial Board.
Jan 2021 – Jul 2023	Associate Editor for the IEEE Conference on Automation Science and Engineering (CASE), flagship conference of the IEEE Robotics & Automation Society.
Jul 2025	Organizer of the workshop "Systems Theory of Optimization, Learning, and Control Algorithms" at the European Control Conference (ECC25)
Dec 2024	Organizer of "Distributed Optimization for Machine Learning in Complex Networks Workshop" for the conclusion of the project "Distributed Optimization for Machine Learning in Complex Networks".
Sep 2021	Organizer of the "OPT4SMART workshop on distributed optimization" for the conclusion of the ERC project OPT4SMART, `https://eventi.unibo.it/opt4smart-workshop`.
Jul 2020	Organizer of the full-day tutorial workshop "Distributed Optimization for Control and Learning. From Theory to Numerical Software Tools" at the 2020 *IFAC World Congress*, `www.ifac2020.org/program/workshops`.

Teaching

Jul 2025	Lecturer for "Control Methods for Distributed Optimization", 15h, national Ph.D. summer school organized by the Italian Society of Professors and Researchers in Automation (SIDRA).
Nov 2023	Lecturer for "Control for Optimization", 10h, DAUSY National Ph.D. Program in Autonomous Systems.
Jan 2022	Lecturer for "A System Theoretical Approach to the Analysis of the ADMM Algorithm for Constrained Optimization", 9h, Ph.D. Degree in IBES-Biomedical, Electrical and Systems Engineering, Università di Bologna.
2021 – current	Lecturer for "Distributed Autonomous Systems - M", 30h, Master Degree in Automation Engineering, Università di Bologna.
	Lecturer for "Automazione dei Processi Industriali - M", 60h, Master Degree in Management Engineering, Università di Bologna.
2020	Lecturer for "System Theory and Advanced Control - M", 30h, Master Degree in Automation Engineering, Università di Bologna. (∼100 students)
	Lecturer for "Controlli Automatici - T2", 30h, Bachelor Degree in Ingegneria dell'Automazione, Università di Bologna. (∼150 students)
2018 – 2020	Teaching assistant for "Distributed Control Systems - M", 30h, Master Degree in Automation Engineering, Università di Bologna.
2016 – 2017	Teaching assistant for "Advanced Control Techniques", 15h, Master Degree in Computer Engineering, Università del Salento.

Mentoring Experience and Student Service

2021-2024	Co-supervision of the Ph.D. student Marco Borghesi (Cycle XXXVII) with G. Notarstefano.
2020-2023	Co-supervision of the Ph.D. student Lorenzo Sforni (Cycle XXXVI) with G. Notarstefano.
2019 – current	Co-supervision of 9 master theses in Automation Engineering at University of Bologna: M. Gholami Derouei (2022), E. Guerra (2021), M. Borghesi (2021), D. Foicu (2021), M. Lanzarini (2021), A. Rosato (2021), A. Sitta (2021), L. Sforni (2020), G. Carnevale (2019)
2017– 2018	Co-supervision of the 2 master theses at Università del Salento: A. Benevento (2017), F. Vitale (2018)

Talks

Dec 2025	I will attend the Intern. Conference on Decision and Control (CDC25) in Rio de Janeiro (Brazil) and present the paper "Passivity-based interpretation of the Tracking-ADMM algorithm for distributed constraint-coupled optimization".
Jun 2025	I attended the European Control Conference (ECC25) in Tessaloniki (Greece) and gave the talk "A passivity-based approach to analyze the ADMM for constraint-coupled optimization".
Dec 2024	I attended the Intern. Conference on Decision and Control (CDC24) in Milan (Italy) and presented the paper "Nonconvex Big-Data Optimization via System Theory: a Block-wise Incremental Gradient Method".
Jan 2024	Invited talk: "A system-theoretic approach to ADMM for constraint-coupled optimization with applications in distributed network systems", University of Stuttgart, Stuttgart.
Dec 2023	I attended the Intern. Conference on Decision and Control (CDC23) in Singapore and presented the papers "On-policy data-driven linear quadratic regulator via combined policy iteration and recursive least squares" and "Discrete-time distributed optimization for linear uncertain multi-agent systems".
Dec 2019	I attended the Intern. Conference on Decision and Control (CDC19) in Nice (France) and presented the paper "System Theoretical Perspective to Gradient-Tracking Algorithms for Distributed Quadratic Optimization".
Dec 2018	I attended the Intern. Conference on Decision and Control (CDC18) in Miami (FL, USA) and presented the paper "Distributed Submodular Minimization over Networks: a Greedy Column Generation Approach".
Dec 2017	I attended the Intern. Workshop on Computational Advances in Multi-sensor Adaptive Processing (CAMSAP17) and presented the paper "Distributed Big-Data Optimization via Block Communications". I have been awarded the Best Paper Award within a Student Paper Contest with 10 finalists.

Jul 2017	I attended the IFAC World Congress (IFAC17) in Toulouse (France) and presented the paper "A duality-based approach for distributed optimization with coupling constraints".
Dec 2016	I attended the Intern. Conference on Decision and Control (CDC16) in Las Vegas (NV, USA) and presented the paper "A duality-based approach for distributed min-max optimization with application to demand side management".
Jun 2016	I attended the European Control Conference (ECC16) in Aalborg (Denmark) and presented the paper "Final-State Constrained Optimal Control via a Projection Operator Approach".
Dec 2015	I attended the Intern. Conference on Decision and Control (CDC15) in Osaka (Japan) and presented the paper "Randomized dual proximal gradient for large-scale distributed optimization".

Institutional Duties

2024 – current	Task leader for the development of online learning didactic modules within the activities of the EU-funded project SPecialised Education programmes in CybersecuriTy and RObotics (SPECTRO) (GA no. 101123118). `https://www.eitdigital.eu/eu-collaborations/spectro/`
2024 – current	Member of the didactic and quality committees for the bachelor and master degrees in Automation Engineering at the University of Bologna.
2022	Member of the final examination committee for the master degree in Automation Engineering at the University of Bologna.
2021	Member of the final examination committee for the XXXIII cycle of the Ph.D. degree in IBES-Biomedical, Electrical and Systems Engineering at the University of Bologna.
2020 – current	Expert Member in the Committee for the qualification exams to the "Engineering Profession" (Automation Class) at the University of Bologna.

Journal Publications

[J1] L. Sforni, I. Notarnicola, G. Notarstefano, "Sparse Data-Driven LQR Via Augmented Lagrangian-Based Policy Search", *IEEE Transactions on Control of Network Systems*, pp. 1–12, 2025.

[J2] M. Bin, I. Notarnicola, T. Parisini "Semiglobal exponential stability of the discrete-time Arrow–Hurwicz–Uzawa primal-dual algorithm for constrained optimization", *Mathematical Programming*, vol. 208, no. 1, pp. 629–660, 2023.

[J3] G. Carnevale, I. Notarnicola, L. Marconi, G. Notarstefano "Triggered Gradient Tracking for Asynchronous Distributed Optimization", *Automatica*, vol. 147, pp. 110726, 2023.

[J4] G. Carnevale, F. Farina, I. Notarnicola, G. Notarstefano "GTAdam: Gradient tracking with adaptive momentum for distributed online optimization", *IEEE Transactions on Control of Network Systems*, vol. 10, no. 3, pp. 1436–1448, 2022.

[J5] I. Notarnicola, A. Falsone "Passivity-based Analysis of the ADMM Algorithm for Constraint-Coupled Optimization", *Automatica*, vol. 146, pp. 110552, 2022.

[J6] I. Notarnicola, A. Simonetto, F. Farina, G. Notarstefano "Distributed Personalized Gradient Tracking with Convex Parametric Models", *IEEE Transactions on Automatic Control*, vol. 68, no. 1, pp. 588–595, 2023.

[J7] A. Camisa, I. Notarnicola, and G. Notarstefano, "Distributed primal decomposition for large-scale MILPs", *IEEE Transactions on Automatic Control*, vol. 67, no. 1, pp. 413–420, 2022.

[J8] A. Camisa, F. Farina, I. Notarnicola, and G. Notarstefano, "Distributed constraint-coupled optimization via primal decomposition over random time-varying graphs", *Automatica*, vol. 131, pp. 109739, 2021.

[J9] A. Camisa, I. Notarnicola, and G. Notarstefano, " Distributed Stochastic Dual Subgradient for Constraint-Coupled Optimization", *IEEE Control Systems Letters*, vol. 6, pp. 644–649, 2021.

[J10] I. Notarnicola, Y. Sun, G. Scutari, and G. Notarstefano, "Distributed big-data optimization via block-wise gradient tracking", *IEEE Transactions on Automatic Control*, vol. 66, no. 5, pp. 2045–2060, 2021.

[J11] A. Falsone, I. Notarnicola, M. Prandini, and G. Notarstefano, "Tracking-ADMM for distributed constraint-coupled optimization", *Automatica*, vol. 117, pp. 108962, 2020.

[J12] I. Notarnicola, and G. Notarstefano, "Constraint-Coupled Distributed Optimization: a Relaxation and Duality Approach," *IEEE Transactions on Control of Network Systems*, vol. 7, no. 1, pp. 483–492, 2020.

[J13] G. Notarstefano, I. Notarnicola, and A. Camisa, "Distributed Optimization for Smart Cyber-Physical Networks," *Foundations and Trends® in Systems and Control*, vol. 7, no. 3, pp. 253–383, 2019.

[J14] I. Notarnicola, R. Carli, and G. Notarstefano, "Distributed partitioned big-data optimization via asynchronous dual decomposition," *IEEE Transactions on Control of Network Systems*, vol. 5, no. 4, pp. 1910–1919, 2018.

[J15] I. Notarnicola, M. Franceschelli, and G. Notarstefano, "A duality-based approach for distributed min-max optimization," *IEEE Transactions on Automatic Control*, vol. 64, no. 6, pp. 2559–2566, 2018.

[J16] I. Notarnicola and G. Notarstefano, "Asynchronous distributed optimization via randomized dual proximal gradient," *IEEE Transactions on Automatic Control*, ol. 62, no. 5, pp. 2095–2106, 2017.

Conference Proceedings

[C1] I. Notarnicola, A. Falsone "Passivity-based interpretation of the Tracking-ADMM algorithm for distributed constraint-coupled optimization", in *IEEE 64th Conf. on Decision and Control*, (Rio de Janeiro, Brazil), 2025.

[C2] G. Carnevale, I. Notarnicola, G. Notarstefano "Nonconvex Big-Data Optimization via System Theory: a Block-wise Incremental Gradient Method", in *IEEE 63rd Conf. on Decision and Control*, (Milan, Italy), 2024.

[C3] L. Sforni, G. Carnevale, I. Notarnicola, G. Notarstefano "On-policy data-driven linear quadratic regulator via combined policy iteration and recursive least squares", in *IEEE 62nd Conf. on Decision and Control*, (Singapore), pp. 5047-5052, 2023.

[C4] T. Liu, M. Bin, I. Notarnicola, T. Parisini, Z.-P. Jang "Discrete-time distributed optimization for linear uncertain multi-agent systems", in *IEEE 62nd Conf. on Decision and Control*, (Singapore), pp. 7439-7444, 2023.

[C5] M. Bin, I. Notarnicola, T. Parisini "Stability, linear convergence, and robustness of the wang-elia algorithm for distributed consensus optimization", in *IEEE 61st Conf. on Decision and Control*, (Cancún, Mexico), pp. 1610–1615, 2022.

[C6] A. Simonetto, I. Notarnicola, "Achievement and Fragility of Long-term Equitability", in *ACM Artificial Intelligence, Ethics, and Society*, (Oxford, UK), 2022.

[C7] L. Sforni, I. Notarnicola, G. Notarstefano "Learning-driven Nonlinear Optimal Control via Gaussian Process Regression", in *IEEE 60th Conf. on Decision and Control*, (Austin, Texas, USA), pp. 4406–4411, 2021.

[C8] G. Carnevale, M. Bin, I. Notarnicola, L. Marconi, G. Notarstefano "Enhanced gradient tracking algorithms for distributed quadratic optimization via sparse gain design", in *IFAC World Congress*, (Berlin, Germany), pp. 2696–2701, 2020.

[C9] F. Farina, A. Camisa, A. Testa, I. Notarnicola, G. Notarstefano "DISROPT: a Python framework for distributed optimization", in *IFAC World Congress*, (Berlin, Germany), pp. 2666–2671, 2020.

[C10] A. Falsone, I. Notarnicola, M. Prandini, and G. Notarstefano, "Combining ADMM and tracking over networks for distributed constraint-coupled optimization", in *IFAC World Congress*, (Berlin, Germany), pp. 2654–2659, 2020.

[C11] M. Bin, I. Notarnicola, L. Marconi, and G. Notarstefano, "A System Theoretical Perspective to Gradient-Tracking Algorithms for Distributed Quadratic Optimization", in *IEEE 58th Conf. on Decision and Control*, (Nice, France), pp. 2994–2999, 2019. Presented during the conference.

[C12] A. Camisa, F. Farina, I. Notarnicola, and G. Notarstefano, "Distributed Constraint-Coupled Optimization over Random Time-Varying Graphs via Primal Decomposition and Block Subgradient Approaches", in *IEEE 58th Conf. on Decision and Control*, (Nice, France), pp. 6374–6379, 2019.

[C13] A. Camisa, I. Notarnicola, and G. Notarstefano, "A Primal Decomposition Method with Suboptimality Bounds for Distributed Mixed-Integer Linear Programming", in *IEEE 57th Conf. on Decision and Control*, (Miami Beach, FL, USA), pp. 3391–3396, 2018.

[C14] A. Testa, I. Notarnicola, and G. Notarstefano, "Distributed Submodular Minimization over Networks: a Greedy Column Generation Approach", in *IEEE 57th Conf. on Decision and Control*, (Miami Beach, FL, USA), pp. 4945–4950, 2018. Presented during the conference.

[C15] I. Notarnicola, Y. Sun, G. Scutari, and G. Notarstefano, "Distributed Big-Data Optimization via Block Communications", in *IEEE 7th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing*, (Curaçao, Dutch Antilles), pp. 557–561, 2017. Presented during the conference.

[C16] I. Notarnicola, Y. Sun, G. Scutari, and G. Notarstefano, "Distributed Big-Data Optimization via Block-Iterative Convexification and Averaging", in *IEEE 56th Conf. on Decision and Control*, (Melbourne, Australia), pp. 2281–2288, 2017.

[C17] I. Notarnicola and G. Notarstefano, "A duality-based approach for distributed optimization with coupling constraints," in *IFAC World Congress*, (Toulouse, France), pp. 14891–14896, 2017. Presented during the conference.

[C18] I. Notarnicola, M. Franceschelli, and G. Notarstefano, "A duality-based approach for distributed min-max optimization with application to demand side management", in *IEEE 55th Conf. on Decision and Control*, (Las Vegas, NV, USA), pp. 1877–1882, 2016. Presented during the conference.

[C19] I. Notarnicola and G. Notarstefano, "A randomized primal distributed algorithm for partitioned and big-data non-convex optimization", in *IEEE 55th Conf. on Decision and Control*, (Las Vegas, USA), pp. 153–158, 2016.

[C20] I. Notarnicola, F.A. Bayer, G. Notarstefano, and F. Allgöwer, "Final-State Constrained Optimal Control via a Projection Operator Approach", in *European Control Conference*, (Aalborg, Denmark), pp. 148–153, 2016. Presented during the conference.

[C21] I. Notarnicola and G. Notarstefano, "Randomized dual proximal gradient for large-scale distributed optimization", in *IEEE 54th Conf. on Decision and Control*, (Osaka, Japan), pp. 712–717, 2015. Presented during the conference.

In compliance with the Italian Legislative Decree no. 196 dated 30/06/2003, I hereby authorize the recipient of this document to use and process my personal details for the purpose of recruiting and selecting staff and I confirm to be informed of my rights in accordance to art. 7 of the above mentioned decree.

Bologna,
August 31, 2025

Ivano Notarnicola