

Short Curriculum Vitae of Luca FERRARINI

Prof. Luca Ferrarini receives a MSc summa cum laude in Electronic Engineering in 1988 at Politecnico di Milano, and in 1990 he receives the post-graduate Cefriel Master diploma in *Information Technologies for Industrial Process Control*. Since 1990 he has been working at Dipartimento di Elettronica e Informazione of Politecnico di Milano, where is currently Full Professor teaching various courses of industrial automation and modeling of discrete production systems.

He is co-author of 7 patents, 5 national and 2 European, on the *design, testing and validation of the control system of industrial processes*. In addition, one patent is pending on *predictive controllers for industrial boilers*. Additionally, he has co-authored more than 200 scientific contributions including journal papers, conference presentations, educational and research books, book chapters, editorials.

He is a *Senior Member* of IEEE. He is member of IEEE IES Technical Committee on Industrial Agents and of IFAC Technical Committee T5.1 on Manufacturing Control. He is also Associate Editor for *IEEE Transaction on Automation Science and Engineering*. In 2009, he is *co-founder* of Enertech Solution, a start-up company devoted to energy efficiency and energy automation.

His research interests include discrete-event systems and Petri nets; predictive control; industrial distributed automation systems; monitoring and control of electro-thermal energy systems; energy efficiency and renewables integration and control.

List of selected recent publications of Luca FERRARINI

1. S. Rastegarpour, S. Gros, L. Ferrarini, " MPC approaches for modulating air-to-water heat pumps in radiant-floor buildings ", Control Engineering Practice, vol. 95, Feb. 2020.
2. S. Rastegarpour, L. Ferrarini, F. Palaioyiannis, "A Distributed Predictive Control of Energy Resources in Radiant Floor Buildings", Journal of Dynamic Systems, Measurement and Control (ASME), 2019, doi:10.1115/1.4043935.f
3. Le Anh Dao, Alireza Dehghani Pilehvarani, Luca Ferrarini and Achilleas Markou, "A Hierarchical Distributed Predictive Control Approach for Microgrids Energy Management", Journal of Sustainable Cities and Society (Elsevier), vol. 48, July 2019, <https://doi.org/10.1016/j.scs.2019.101536>.
4. G. Kalogeras, S. Rastegarpour, C. Koulamas, A.P. Kalogeras, J. Casillas, L. Ferrarini, "Predictive Capability Testing and Sensitivity Analysis of a Model for Building Energy Efficiency", International Journal of Building Simulation, Springer, August 2019, <https://doi.org/10.1007/s12273-019-0559-8>.
5. C. Koulamas, A.P. Kalogeras, R. Pacheco-Torres, J. Casillas, L. Ferrarini, "Suitability analysis of modeling and assessment approaches in energy efficiency in buildings", Energy and Buildings, vol. 158 (2018), p. 1662-1682. ISSN 0378-7788, <https://doi.org/10.1016/j.enbuild.2017.12.002>.
6. L. Ferrarini and G. Mantovani, "Temperature Control of a Commercial Building with Model Predictive Control techniques", *IEEE Transactions on Industrial Electronics*, p. 2651 - 2660, Vol. 62, Issue 4, 2014. DOI: 10.1109/TIE.2014.2387095.
7. G. Mantovani, G. T. Costanzo, M. Marinelli, L. Ferrarini, "Experimental Validation of Energy Resources Integration in Microgrids via Distributed Predictive Control", *IEEE Transactions on Energy Conversion*, pag. 1-8, Volume: PP, Issue: 99, 2014, ISSN 0885 - 8969, DOI: 10.1109/TEC.2014.2362887.
8. L. Ferrarini, J. Carneiro, "Preventing thermal overloads in transmission circuits via model predictive control" , *IEEE Transactions on Control System Technology*, Volume: 18 , Issue: 6, Digital Object Identifier: 10.1109/TCST.2009.2037921, 2010 , Page(s): 1406 - 1412.
9. Soroush Rastegarpour, Lorenzo Caseri, Luca Ferrarini, Experimental Validation of the Control-Oriented Model of Heat Pumps for MPC Applications, IEEE International Conference on Automation Science and Engineering, Vancouver, BC, Canada, 22-26 August 2019, p.1249-1255, <https://doi.org/10.1109/COASE.2019.8843211>.
10. Luca Ferrarini, Ehsan Fathi, Samuele Disegna, Soroush Rastegarpour, Energy consumption models for residential buildings: a case study, IEEE International Conference on Emerging Technologies and Factory Automation, Zaragoza, Spain, 10-13 September 2019, p.673-678, <https://doi.org/10.1109/ETFA.2019.8869151>.

11. Pacheco-Torres Rosalía, Cerro-Prada Elena, Soroush Rastegarpour, Luca Ferrarini, Modeling Calibration and Energy Dynamic Simulation of Heating Radiant Floors with Phase Change Materials, 4th Building Simulation and Optimization Conference, Cambridge, UK, 11-12 September 2018, p.382-388.
12. Soroush Rastegarpour, Mahshid Ghaemi, Luca Ferrarini, A Predictive Control Strategy for Energy Management in Buildings with Radiant Floors and Thermal Storage, SICE International Symposium on Control Systems (SICE ISCS), Tokyo City University, Tokyo, Japan, March 9-11, 2018, p.67-73, DOI: 10.23919/SICEISCS.2018.8330158.
13. M. Delfanti, D.Falabretti, L. A. Dao, L. Piroddi and L. Ferrarini, Smart City Vizzate Project: Development and Field Test of an Architecture for the Local Dispatching of Distribution Networks, International AEIT Annual Conference, 2017.
14. L. A. Dao, L. Ferrarini, and L. Piroddi, MPC-Based Management of Energy Resources in Smart Microgrids, 14th International Conference on Informatics in Control, Automation and Robotics (ICINCO), 2017.
15. L. A. Dao, L. Piroddi, and L. Ferrarini, Ensemble Methods For PV Production Prediction From Meteo Services, 6th IEEE International Conference on Clean Electrical Power, Santa Margherita, Italy, June 2017.
16. L. A. Dao, L. Piroddi, and L. Ferrarini, " Impact of Wind Power Prediction Quality on the Optimal Control of Microgrids", 5th IEEE Int. Conf. on Clean Electrical Power, Taormina, Italy, 16-18 Jun 2015,
17. S. Meddouri, L. A. Dao, and L. Ferrarini, " A Predictive Control Scheme for an Autonomous Induction Generator with Saturation Effect", 5th IEEE Conf. on Clean Electrical Power, Taormina, Italy, 16-18 Jun 2015,
18. L. Ferrarini, G. Mantovani and G. Costanzo, "A Distributed Model Predictive Control approach for the integration of flexible loads, storage and renewables", IEEE International Symposium on Industrial Electronics, Istanbul, Turkey, 1-4 Jun 2014, p. 1700 - 1705. DOI: 10.1109/ISIE.2014.6864871

List of recent Projects coordinated by Luca FERRARINI

- A. ESMARTCITY (2018 – 2021 – EU Interreg MED programme). The main objective is the improvement of the innovation capacity of the cities in the MED region by creating innovative ecosystems, through 9 pilots in different MED cities using digital technologies and energy efficiency technologies to provide better services to the citizens with less environmental impact.
- B. STEER (Support Tool for Energy Efficiency pRogrammes in medical centres), funded under H2020 in 2014-2018, is devoted to hospitals and medical centers, with the specific goal of modeling and control of energy consumption in different scenarios and decision support on the most appropriate energy reduction plan for the medium-long term.
- C. CASSANDRA European Project (2011-2014), funded under FP7 programme. The project aims to build a platform for the realistic modeling of the energy market stakeholders, also involving small-scale consumers. CASSANDRA main outcomes will be the aggregation methodology and the framework of key performance indicators for scenario assessment, as well as an expandable software platform that providing different energy stakeholders with the ability to model the energy market, in order to assess scenarios for their own purposes.
- D. PowerCity. It aims to the engineering of a new product which integrates photovoltaic, insulated glazing, window, electrical connection, monitoring and diagnosis systems. BiPV (Building Integrated PhotoVoltaics) modules are designed in standard formats to facilitate mounting, but are customizable in terms of shape, dimensions, color, transparency, typology and positioning of photovoltaic cells.
- E. MEDEIA - Model-Driven Embedded System Design Environment for the Industrial Automation Sector (FP7-ICT-2007-1-211448, 2008-2010), aiming at developing innovative model-driven methodologies and tools for the design of distributed mechatronic automation systems.