

CURRICULUM VITAE

Virginia Casella

virginia.casella@edu.unige.it

Education

- 2010-2015: High school diploma (Classical high-school *Gabriello Chiabrera* in Savona).
Final mark: 84/100
- 2015-2017: Degree course in mathematics at the University of Turin - Department of Mathematics.
Final evaluation: not achieved.
- 2017-2020: Degree course in Industrial and Management Engineering (industrial curriculum) at the University of Genoa- Department of Mechanical, Energy, Management and Transport Engineering
Graduation date: 18/09/2020
Final evaluation: 110/110
Thesis title: "*Electric vehicle charging management: an optimization model for electric bus fleets*".
- 2020-2022: Degree course in Energy Engineering at the University of Genoa - Department of Mechanical, Energy, Management and Transport Engineering
Graduation date: 17/10/2022
Final evaluation: 110/110 cum laude
Thesis title: "*The UK electricity market mechanism: a tool for a BESS optimal dispatching*".
- 2022-present: *PhD in Computer Science and System Engineering – curriculum System Engineering at Genoa University.*

PhD complementary courses

- Model Predictive Control, A. Bemporad (IMT Lucca) 2 CFU;
- Numerical Optimization, A. Bemporad (IMT Lucca), 2 CFU;
- Numerical Methods for Optimal Control, M. Zanon (IMT Lucca), 2 CFU;
- An Introduction to Model Predictive Control and Rolling Horizon Optimization, M. Gaggero (UNIGE), 5 CFU;
- Distributed Optimization and Multi Decision Making, G. Ferro (UNIGE), 5 CFU;
- EECI course "Game theory with Engineering Applications", D. Bauso (University of Groningen) and L. Stella (University of Birmingham)
- Masterclass "Comunità Energetiche", GreenHill Advisory, 1 CFU;

Didactic and tutoring activities

Co-Supervisor/Supervisor of bachelor and master thesis

- Sara Lagascio "Un sistema di supporto alle decisioni per la definizione ottimale di comunità energetiche", Bachelor Degree in Ingegneria meccanica energia produzione.

Tutoring activities

- Tutoring activity 2022/2023: Inclusion and support program aimed at students with gaps in electrical engineering, technical physics, machine and power engineering preparation (project A_ING_15SV, University of Genoa).
- Tutoring activity 2023/2024: Tutor at the orientation center, career service and inclusion service (project A_ORIE_01, University of Genoa).

Reviewing activities

Reviewer for international papers

- IEEE Transactions on Automation Science and Engineering.
- Control Engineering Practice

Reviewer for international conferences

- 12th IFAC Symposium on Control of Power & Energy Systems – CPES 2024
- 20th International Conference on Automation Science and Engineering – CASE 2024
- 63rd IEEE Conference on Decision and Control -CDC 2024
- 3rd Control Conference Africa - CCA 2024
- 8th IEEE Forum on Research and Technologies for Society and Industry Innovation – RTSI 2024

Editorial activities

Organization of Special Issues for international journals

- IFAC Journal of Systems and Control IAMES, "*Modelling, optimization, and control for managing energy and environment transitions*", Michele Robba, Giulio Ferro, Virginia Casella (University of Genoa), Marialuisa Volta (Università di Brescia), Giorgio Guariso (Polytechnic University of Milan), Ronal Van Nooiyen (Technical University Delft), François Perès (University of Toulouse), Elizabeth Ratnam (Australian National University), Hanane Dagdougui (Polytechnique de Montréal).

Organization of Special Sessions for international conferences

- IFAC IAMES 2024 "Sustainable Districts' Optimization and Control", Virginia Casella, Yassine Ennassiri, Luca Parodi (University of Genoa).

- IEEE CASE 2024 "Energy Communities: optimization and control for sustainability", Luca Parodi, Virginia Casella, Michela Robba, Giulio Ferro, Roberto Sacile (University of Genoa), Raffaele Carli, Paolo Scarabaggio (University of Bari), Luigi Glielmo (University of Sannio), Giuseppe Notarstefano (University of Bologna).

Organization of Open Invited Tracks for international conferences

- IFAC CPES 2024 "Optimal Control, Management, and Scheduling in Energy Hubs" Virginia Casella, Yassine Ennassiri, Giulio Ferro, Luca Parodi, Michela Robba (University di Genoa).

Projects

1. PRIN (2022) – ECODREAM: Energy Community management: Distributed Algorithms and toolboxes for efficient and sustainable operations. Activities involve the use of distributed algorithms for the optimization of Renewable Energy Communities for both planning and management (internal and external).
2. RAISE - Spoke 3: Robotics and AI for Socio-economic Empowerment - Smart and sustainable ports. Activities involve the definition of operational strategies for properly managing a multi-energy port hub. In particular, models for energy efficiency in the port environment will be considered including energy scheduling and predictive maintenance tools. Port system logistics will also be included, with the ultimate goal of implementing active demand management policies (demand response).
3. DUT (2023-2026) - OPEN4CE: Service-oriented Open Platform for Citizen Energy Communities a collaborative platform. The project is funded by the European Commission (Grant No. 101069506) for the Driving Urban Transitions (DUT) call. Activities involve the development of optimization models to be integrated within an innovative service-oriented platform to facilitate citizen participation and integration of energy communities.

Publications

International journals

1. Virginia Casella, Daniel Fernandez Valderrama, Giulio Ferro, Riccardo Minciardi, Massimo Paolucci, Luca Parodi and Michela Robba "Towards the Integration of Sustainable Transportation and Smart Grids: A Review on Electric Vehicles' Management". *Energies* 2022, 15, 4020.
2. Virginia Casella, Giulio Ferro, Michela Robba "A decentralized optimization approach to the power management of electric vehicles parking lots", *Sustainable Energy, Grids and Networks*, Volume 38, 2024, 101301, ISSN 2352-4677, <https://doi.org/10.1016/j.segan.2024.101301>.
3. V. Casella, A. La Fata, S. Suzzi, R. Barilli, G. Barbero "The UK electricity market mechanism: a tool for a BESS optimal dispatching", *Renewable energies* 2023.

4. submitted - V. Casella, G. Ferro, R. Minciardi, L. Parodi, M. Robba, "Optimal charging of electric buses: a new bi-level architecture for periodic scheduling", IEEE Transactions on Automation Science and Engineering.
5. submitted - V. Casella, G. Ferro, A. Parisio, M. Robba, M. Rossi, "Decentralized droop sharing for cooperative energy storage systems in dynamic regulation services", IEEE System Journal

International Conferences

1. V. Casella, G. Ferro, R. Minciardi, L. Parodi, M. Robba "Optimal charging of electric buses: a periodic discrete event approach." *2021 29th Mediterranean Conference on Control and Automation (MED)*. IEEE, 2021.
2. M. Aicardi, V. Casella, G. Ferro, R. Minciardi, L. Parodi, M. Robba "Optimal control of electric vehicles charging in a smart parking.", *Proceedings of IFAC Conference on Integrated Assessment models for environmental systems*, Tarbes, 2022.
3. Virginia Casella, Giulio Ferro, Riccardo Minciardi, Luca Parodi, Michela Robba "Optimization of electric buses charging station with multiple sockets: The case of Genoa Municipality" submitted to IFAC WC 2023.
4. V. Casella, R. Minciardi, L. Parodi "Optimization of Electric Bus Charging: Integrating Discrete Event Modeling in Public Transportation Systems", *3rd IFAC Workshop on Integrated Assessment Modeling for Environmental Systems (IAMES 2024)*.
5. Virginia Casella, Giulio Ferro Member, Luca Parodi, Michela Robba, "Energy Community Optimal Management: A Bilevel Approach", *2024 IEEE 20th International Conference on Automation Science and Engineering*.
6. Virginia Casella, Alice La Fata, Stefano Suzzi, Giulia Barbero, Riccardo Barilli, "A Tool to Optimize the Participation of BESS to the UK Ancillary Services Market", *2024 IEEE 20th International Conference on Automation Science and Engineering*

Participation in conferences

Speaker at International Conferences

- 3rd IFAC Workshop on Integrated Assessment Modeling for Environmental Systems Savona, Italy, May 29th-31st, 2024.

Speaker at National Conferences

- Automatica.it (SIDRA national congress) Cagliari, 1-3 September 2022

Committee Member at International Conferences

- National Organizing Committee member at IFAC IAMES2024
- Member of technical committee IFAC TC 6.3 Power and energy system

Awards and recognitions

- ABB Ferrari Graduation Award for the academic year 2021/2022 in Energy Transition.
- Best Young Paper Award IAMES 2024 for the paper co-authored with Luca Parodi and Riccardo Minciardi entitled "Optimization of Electric Bus Charging: Integrating Discrete Event Modeling in Public Transportation Systems" presented at 3rd IFAC Workshop on Integrated Assessment Modeling for Environmental Systems Savona, Italy, May 29th – 31st, 2024.

Languages

- English Certification B1 Preliminary – Intermediate level
Cambridge University, 2012, Europass level B1
- English - First
Cambridge Assessment English, 08 May 2015, Europass level B2

Research activity description

My research activity regards the optimization and the optimal control of energy systems. In particular, in the last years I have been working on electric mobility, with a particular focus on the optimal charging scheduling of an EVs fleet. More recently, I am investigating the optimal management of multi-carrier energy hubs with the integration of hydrogen components in energy systems such as microgrids; the goal here is to develop some optimization models that considers also the dynamics of these components. Finally, I am studying the currently-underway legislation about Renewable Energy Communities (REC) to set up both planning and scheduling optimization problems for managing REC in an optimal way.