

Giacomo-Piero Schiapparelli

ELECTRICAL ENGINEER

Aware that anyone who makes false statements, forms or makes use of false acts is punishable under the Penal Code and special laws, declares to possess the qualifications and have carried out the activities listed below:

EDUCATIONAL AND ACADEMIC QUALIFICATIONS

At present	Research fellow , UNIVERSITY OF GENOA, POLYTECHNIC SCHOOL, DITEN Research grant funded by Regione Liguria (2 years). <i>Genoa, Italy</i>
Nov. 2020	Ph.D. course in: SCIENCE AND TECHNOLOGY FOR ELECTRICAL ENGINEERING, MARINE ENGINEERING, COMPLEX SYSTEMS FOR MOBILITY, curriculum: ELECTRICAL ENGINEERING , UNIVERSITY OF GENOA, POLYTECHNIC SCHOOL, DITEN Main focus on: battery energy storage systems, smart grids, active distribution networks, real-time HIL simulations, grid-services, renewables, control systems, optimal control systems, model predictive control, forecast algorithms. Tutors Professor Stefano Massucco (UniGe) and Professor Federico Silvestro (UniGe). (Endorsement letters under request). PhD thesis defense planned on May/June 2020. <i>Genoa, Italy.</i>
Jan. 2019	State examination II session 2018 , UNIVERSITY OF GENOA, POLYTECHNIC SCHOOL, DITEN Overtaking of the state exam for the qualification to practice as an electrical engineer. Registered in the register of Genoa engineers since 11/02/2019 number 10708 (GE) section A , sector Industrial engineering. <i>Genoa, Italy.</i>
Oct. 2017	Master Degree in Electrical Engineering (INDUSTRIAL ENGINEERING) , UNIVERSITY OF GENOA, POLYTECHNIC SCHOOL, DITEN Master thesis title "Quantification of primary frequency control provision from battery energy storage systems connected to active distribution network", developed during mine semester abroad at the Distributed Electrical System Laboratory DESL, EPFL, Lausanne with Professor Mario Paolone (EPFL) and Professor Stefano Massucco (UniGe). Degree on 27/10/2017 with the following final grade: 110/110, summa cum laude and recommendation to publish the study. <i>Genoa, Italy and Lausanne, Switzerland</i>
Oct. 2015	Bachelor Degree in Electrical Engineering (INDUSTRIAL ENGINEERING) , UNIVERSITY OF GENOA, POLYTECHNIC SCHOOL, DITEN Thesis title: "Switched reluctance Motors: Analysis, Models and Controls" with Professor Paolo Pozzobon and Professor Stefano Savio. Degree on 30/10/2015 with the following final grade: 104/110. <i>Genoa, Italy</i>
Jun. 2012	High school , LICEO-GINNASIO ANDREA D'ORIA Secondary school leaving certificate focusing in humanities, final grade 85/100. <i>Genoa, Italy.</i>
Jul. 2011	First Certificate In English , (FCE) Level: B2. <i>Genoa, Italy.</i>

STUDY EXPERIENCES ABROAD

Mar. - Jul. 2019	Host Ph.D. student , ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE (EPFL) Semester abroad for research in the field of power system modeling and stability in presence of power converters. (Endorsement letters under request). <i>Lausanne, Switzerland.</i>
Feb. - Jul. 2017	Semester abroad , ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE (EPFL) Semester abroad for studying and research for the master thesis spent as a "Visiting Student". <i>Lausanne, Switzerland.</i>

WORK EXPERIENCES

- Mar - Dec 2019* | **Teaching activities**, COURSE: "ENGINEERING PROGRAM, ELECTRICAL SPECIALIZATION FOR THE UNITED ARAB EMIRATES NAVY" The activities concern lessons (20h) on topics regarding power system planning, stability, and control. *Genoa, Italy.*
- A.Y. 2018/2019* | **Teaching support activities**, COURSE: "FUNDAMENTALS OF ELECTRIC POWER SYSTEMS CONTROL" Prof. Stefano Mas-succo. The activities concern lessons and exercises. *Genoa, Italy.*
- Jul. - Sep. 2017* | **Internship**, WORKING STUDENT AT UMS SKELDAR a company acting in the field military defence, civil security and maritime, providing rotary and fixed wing Unmanned Aerial Vehicle (UAV) platforms (References available upon request). *Basel, Switzerland.*
- Oct. 2015-2017* | **Representative of the student body at the CCS**, COUNCIL OF ELECTRICAL ENGINEER, DITEN, POLYTECHNICAL SCHOOL, UNIVERSITÀ DEGLI STUDI DI GENOVA. *Genova, Italy.*

PRIZES AND AWARDS

- Sep. 2018* | **Winner of the IEEE ABB Master Thesis Award 2018 in the category SMART ENERGY SYSTEMS, SMART GRIDS, SMART INDUSTRIAL SYSTEMS.** The award has been presented during the Award Ceremony to be held at the 4th International Forum on Research and Technologies for Society and Industry (RTSI 2018).
- Nov. 2018* | **Winner of the ABB "In. GB Ferraris" Master Thesis Award 2018 in the category SMART GRIDS E SMART CITIES.** The award has been presented during the Award Ceremony to be held at the "Genova Smart Week" event on Monday 19 November 2018.

PhD COURSES, CONFERENCES, SEMINARS, WORKSHOPS

- Feb. - Jun. 2020* | **Ph.D. course "PRINCIPLES OF ELECTROCHEMISTRY AND EMERGING TECHNOLOGIES FOR ENERGY CONVERSION AND STORAGE,"** UNIVERSITY OF GENOVA, POLYTECHNIC SCHOOL, PH.D. PROGRAM IN CIVIL, CHEMICAL AND ENVIRONMENTAL ENGINEERING. FEB. - JUN., 2020. *Genoa, Italy.*
- Dec. 2019* | **Ph.D. course "INTRODUCTION TO UNCERTAINTY QUANTIFICATION AND STOCHASTIC SENSITIVITY ANALYSIS,"** UNIVERSITY OF GENOVA, POLYTECHNIC SCHOOL, PH.D. PROGRAM IN CIVIL, CHEMICAL AND ENVIRONMENTAL ENGINEERING. DEC. 17-19, 2020. *Genoa, Italy.*
- Sep. 2019* | **21st European Conference on Power Electronics and Applications (EPE'19 ECCE - EUROPE),** EPE'19 ECCE - EUROPE, SEPTEMBER 2-6, 2019. *Genova, Italy.*
- Jun. 2019* | **13th IEEE PowerTech 2019,** BOVISA CAMPUS, POLITECNICO DI MILANO, JUNE 23-27, 2019. *Milano, Italy.*
- Apr. 2019* | **Ph.D. course "ASSESSMENT AND ENHANCEMENT OF POWER SYSTEM STABILITY OF CONTEMPORARY AND FUTURE POWER NETWORKS,"** SCHOOL OF ELECTRICAL AND ELECTRONIC ENGINEERING, THE UNIVERSITY OF MANCHESTER, APRIL 10 - 12, 2019. *Manchester, UK.*
- Jun. 2018* | **PSCC 2018,** 20TH POWER SYSTEMS COMPUTATION CONFERENCE, JUNE 11-15, 2018 *Dublin, Ireland.*
- May 2018* | **Ph.D. school EUROPEAN PHD SCHOOL: POWER ELECTRONICS, ELECTRICAL MACHINES, ENERGY CONTROL AND POWER SYSTEMS,** MAY 21-25, 2018. *Gaeta, Italy.*
- May 2018* | **Course "OPAL-RT TRAINING ACADEMY 2018,"** MAY 15-18, 2018. *Paris, France.*
- Mar. 2018* | **Ph.D. course "MODEL PREDICTIVE CONTROL AND APPLICATIONS,"** PH.D. PROGRAM IN COMPUTER SCIENCE AND SYSTEMS ENGINEERING (18H), UNIVERSITY OF GENOVA. *Genova, Italy.*
- Mar. 2018* | **Seminary AEIT-AEE "GLI ODIERNI ORIZZONTI DEI SISTEMI DI PROTEZIONE DELLE RETI ELETTRICHE,"** FLORENCE, MARCH 16, 2018. *Florence, Italy.*
- Dec. 2017* | **Seminary AEIT-AEE "LA TRASFORMAZIONE DEL SISTEMA ELETTRICO, LE NUOVE ESIGENZE DI GESTIONE E GLI STRUMENTI PER FARVI FRONTE,"** MILAN, DECEMBER 5, 2017. *Milan, Italy.*
- Jun. 2016* | **Workshop AEIT "RICERCA E FORMAZIONE NEL SETTORE DEI SISTEMI ELETTRICI PER L'ENERGIA,"** JUNE 20, 2016. *Genova, Italy.*
- Jun. 2016* | **PSCC 2016,** 19TH POWER SYSTEMS COMPUTATION CONFERENCE, JUNE 20-24, 2016. *Genova, Italy.*

PROJECTS WITH INDUSTRIAL PARTNERS

- 2020 **Project Yanmar E-TURBO & ELECTRIC POWERTRAIN** The project relies on the design, sizing and control system definition of 1) an electric assisted turbocharger for marine diesel engine 2) of a hybrid electric powertrain. The study case consist of a pleasure boat. *Italy, Japan*
- 2020 **Mediterranean Project II (MP II)** MED-TSO The Mediterranean Project II (MP II) is an ongoing two year project performed by Med-TSO and supported by the European Commission. The main goal is to develop a proposal of common rules in the Mediterranean region in the framework of system services in order to complement the proposal already developed by Med-TSO between 2015 and 2018 during Mediterranean Project I. I was involved in the project by CESI for consultancy and support activities. *Italy*
- 2020 **Project SHIL SHIP IN THE LOOP** The project involves the design and the practical implementation of a research infrastructure capable to perform power hardware in the loop (PHIL) testing of a ship. The system consists of Shipboard microgrid PHIL facility, hydrodynamic testing facility and cyber security testing infrastructure. The application for this specific project was organized and written in first person by myself with the supervision of Prof. Federico Silvestro and with the collaboration of the other partners and was financed with 1 million euro. The system assembly, for the electrical part, is at the present personally realised by myself. *Italy*
- 2020 **Project Second Life Batteries** The project involves the study and prototyping of an integrated PV-Battery system using second-life automotive batteries. The final system will be deployed, at the end of the project, in some buildings in Lebanon. *Italy, Lebanon*
- 2020 **Project Microgrid models** The project involves the design of real-time models in Opal RT of AC and DC microgrids and shipboard power systems for control and protection scheme tests for ABB S.p.A.. The model are defined to fully replicate the real behavior of the electrical mechanic and hydrodynamic systems, controls, monitoring systems and SCADA in HIL testing configuration. *Italy*
- 2020 **Project PMU** The activity, object of this collaboration, aims to investigate some methods described in the literature for the protection of distribution networks by means of Phase Measurement Unit (PMU). Specific application of state estimation techniques are adopted to design innovative protection schemes for active distribution networks. *RSE S.p.A., Milan, Italy*
- 2020 **Project Ship2Grid** Research activity in collaboration with RSE S.p.A. on the feasibility and technical-economic potential of the electrification of ports in Italy. The study includes load demand analysis, emission analysis, economic analysis and regulation proposals in the Italian scenario. *RSE S.p.A., Milan, Italy*
- 2019-2020 **Project BES "MODELS AND ANALYSIS OF LOADS FOR THE DEVELOPMENT OF INNOVATIVE ELECTRIC POWER LOAD ANALYSIS (EPLA) PROCEDURE BASED ON SIMULATIONS"** Shipboard power system EPLA with specific focus on stochastic load analysis and modeling and simulation load analysis. The project aims to develop a tool for the ship EPLA suitable to be used in the electric system design which is able to define the main electric system parameters and expected load profiles to be used in Model Based Design (MBD). *Fincantieri S.p.A. Genova, Italy*
- 2018-2019 **Project SIAC "STORAGE SYSTEM AND DISTRIBUTED GENERATION ON BOARD"** Study on storage system technologies and sizing for applications in the field of shipboard power systems. Specifically, the project focus on the selection and the best storage technology and on the system sizing with the objective of maximizing power system stability. *Fincantieri S.p.A. Genova, Italy*
- 2018-2019 **Project PMS** Design and realization of a mockup of shipboard power system suitable to be used for research and teaching activities. *ABB Marine Genova, Italy*

PROJECTS WITH ACADEMIC PARTNERS

- 2020 **Research on MICROGRID LV TEST BENCH** Realization of a Low Voltage (LV) microgrid consisting in diesel generator and an inverter suitable to be used frequency stability studies. *Italy, Japan*
- 2020 **Research on EQUIVALENT MODELING OF SHIPBOARD ELECTRIC SYSTEMS** The research activity, in collaboration with the group of Professor Michele Martelli from Naval Architecture Department of the University of Genova, has driven out in the context of project ARES (Autonomous Robotics for the Extended Ship). Specifically, it consists on the definition of a shipboard power system equivalent model suitable to be used multiphysics simulations for the development of a ship dynamic positioning system. *Italy*.
- 2019 **Research on MODERN POWER SYSTEM STABILITY** The research activity driven out in Lausanne with the supervision of Professor Mario Paolone from École Polytechnique Fédérale de Lausanne (EPFL), consists on the study of Converter Interfaced Generation (CIG) in transmission systems. Innovative equivalent system modeling, system identification procedures, and real-time HIL simulation systems have been developed from this research [?]. *Lausanne, Switzerland*.
- 2018 **Research on SHIPBOARD DC MICROGRIDS** The research activity driven out with supervision of Professor Samuele Grillo from Politecnico di Milano, consists of the study of DC systems stability [?]. *Italy*.
- 2017 **Research on FREQUENCY CONTROL PROVIDED BY BESS** The research activity driven out in Lausanne with the supervision of Professor Mario Paolone from École Polytechnique Fédérale de Lausanne (EPFL), consists of the definition of innovative energy management strategy for Battery Energy Storage Systems performing frequency control services [?]. *Lausanne, Switzerland*.

PERSONAL SKILLS

Good knowledge of IT TOOLS such as MathWorks MATLAB/Simulink, GAMS, OPAL-RT, RT-LAB, Bentley MicroStation CAD, Homer Pro, Python, LabVIEW, RapidHareness, dSpace, Microsoft Word, Excel, Office, Latex and Operating Systems such as Windows, Apple iOS and Linux.

Member of IEEE (94591791) and AEIT (Italian Association of Electrical, Electronics, Automation, Information and Communication Technology).

OTHER INFORMATION, PERSONAL GROWTH, VOLUNTEERING AND SPORTS

Aug. 2014 **Volunteering, NICARAGUA WORKCAMP 2014**, construction of a classroom of about 60 square meters for a school of boys suffering from various disabilities near Diriamba, Nicaragua, 1-31 August 2014. *Diriamba, Nicaragua*.

Since 1999 **Sport, SAILING**, competitive sailing at national and international level (Optimist, RS Feva, Laser 4.7, Laser radial, Laser std). 2007 national champion RS Feva.

Licenses: Driving license category A (motorbikes) and B (cars). Nautical license (without distance limits from the coast).

Member of the Yacht Club Italiano.

LIST OF PUBLICATIONS

- [1] F. Silvestro, F. D'Agostino, G. P. Schiapparelli, A. Boveri, D. Patuelli, and E. Ragaini, "A collaborative laboratory for shipboard microgrid: Research and training," *Proceedings AEIT Annual Conference*, 2018.
- [2] G. P. Schiapparelli, E. Namor, F. Sossan, R. Cherkaoui, S. Massucco, and M. Paolone, "Quantification of primary frequency control provision from battery energy storage systems connected to active distribution networks," in *2018 Power Systems Computation Conference (PSCC)*, pp. 1-7, June 2018.
- [3] G. P. Schiapparelli, F. Conte, S. Massucco, and F. Silvestro, "Optimal management of battery storage system," *AEIT*, vol. 104, pp. 15-23, 2019.
- [4] F. Conte, S. Massucco, G. P. Schiapparelli, and F. Silvestro, "Frequency regulation services by a bess-generator system using predictive control," in *2019 IEEE Milan PowerTech*, IEEE, 2019.

- [5] F. D'Agostino, G. P. Schiapparelli, F. Silvestro, and S. Grillo, "Dc shipboard microgrid modeling for fuel cell integration study," in *IEEE Power Engineering Society General Meeting, 2019*, IEEE, 2019.
- [6] F. Conte, S. Massucco, G. P. Schiapparelli, and F. Silvestro, "Day-ahead and intra-day planning of integrated bess-pv systems providing frequency regulation," *IEEE Transactions on Sustainable Energy*, 2019.
- [7] F. D'Agostino, S. Massucco, G. P. Schiapparelli, and F. Silvestro, "Modeling and real-time simulation of a dc shipboard microgrid," in *2019 21th European Conference on Power Electronics and Applications (EPE'21 ECCE Europe)*, Sep. 2019.
- [8] F. Conte, S. Massucco, G. P. Schiapparelli, F. Silvestro, M. Paolone, and Y. Zuo, "Frequency stability assessment of modern power systems: models definition, parameters identification and real-time simulations," *Sustainable Energy, Grids and Networks*, vol. 23, p. 100384, 2020.
- [9] F. D'Agostino, S. Massucco, G. P. Schiapparelli, F. Silvestro, and M. Paolone, "Performance comparative assessment of grid connected power converters control strategies," in *2020 IEEE International Conference on Industrial Electronics for Sustainable Energy Systems (IESES)*, IEEE, 2020.
- [10] F. D'Agostino, P. Gualeni, G. P. Schiapparelli, and F. Silvestro, "Control strategy and architecture for integrating distributed fuel cells on board large cruise ships," in *2020 International Symposium on Power Electronics, Electrical Drives, Automation and Motion*, IEEE, 2020.
- [11] F. D'Agostino, D. Kaza, M. Martelli, G. Schiapparelli, F. Silvestro, and C. Soldano, "Development of a multiphysics real-time simulator for model-based design of a dc shipboard microgrid," *Energies*, 2020, 13 (14), 3580, 2020.
- [12] F. D'Agostino, D. Kaza, G.-P. Schiapparelli, and F. Silvestro, "The shil project: a new laboratory infrastructure for co-simulation of multi-domain marine applications," in *2020 AEIT International Annual Conference (AEIT)*, pp. 1–6, IEEE, 2020.
- [13] F. Conte, B. Gabriele, and G.-P. Schiapparelli, "Assessment of state estimation methods for power systems with uncertain parameters," in *2020 55th International Universities Power Engineering Conference (UPEC)*, pp. 1–6, IEEE, 2020.
- [14] F. D'Agostino, D. Kaza, G.-P. Schiapparelli, F. Silvestro, C. Bossi, and F. Colzi, "Assessment of the potential shore to ship load demand: the Italian scenario," in *submitted to IEEE Power Engineering Society General Meeting, 2021*, IEEE, 2021.
- [15] F. Conte, B. Gabriele, G.-P. Schiapparelli, F. Silvestro, C. Bossi, and M. Cabiati, "Optimal positioning of pmus for fault detection and localization in active distribution networks," in *submitted to 2021 IEEE Madrid PowerTech*, IEEE, 2021.
- *References [?] and [?] been submitted on Nov-2020 and are currently under review.

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December 4, 2020

