Personal information

First name(s) / Surname(s)	Renato PROCOPIO
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E-mail	renato.procopio@unige.it
Nationality	Italian
Date of birth	06/03/1974

Desired employment / Occupational field

Work experience

Dates	2001-2015
Occupation or position held	PhD Student (2001-2004), Post doctoral position (2004-2010), Researcher at the University of Genoa (2010-2014), Associate Professor at the University of Genoa (2015).

Main activities and responsibilities

RESEARCH

Scientific activity at the Electrical Engineering Department of the University of Genoa (Laboratory of Power Systems - SSD: ING-IND/33) on the following topics:

- Lightning Phenomenon, aimed at describing in details the effects of lightning events on power overhead transmission lines and buried cables. To do this, first of all, the problem of a thorough modeling of the channel current has been investigated; then a complete modeling of the electromagnetic fields generated by a lightning discharge has been studied in order to validate all the approximate expressions present in literature. Contemporarily, the problem of the coupling between lightning electromagnetic fields and transmission lines of finite length has been faced to find out all the cases in which the classical TL theory works and the situations in which it fails. Finally, some practical configurations have been considered to define possible effective protection schemes against lightning induced overvoltages. This research line has been conducted in cooperation with:

- University of Naples "Federico II" (Prof. L. Verolino e Prof. A. Andreotti)
- University of Florida – Gainesville (Prof. M. Uman e Prof. V. Rakov);
- Swiss Federal Institute of Technology – Lausanne (Prof. F. Rachidi);
- University of Bologna (Prof. C.A. Nucci);
- University of Magdeburg (Prof. S. Tkachenko)

- Study of Power Quality phenomena and analysis of advanced devices to mitigate them. First of all, the Voltage Sag Compensation capability of Static Series Compensators (SSC) has been studied and efficient control schemes have been proposed. Then, the control system has been modified in order to use the same device also as a Reactive Power Compensator. From 2005 on, the increasing importance of Renewables has suggested the possibility to employ them as Ancillary Services Providers. In particular, some effective control schemes have been developed for the use of Photovoltaic (PV) or Wind Energy Units to support MV distribution grid voltage providing reactive power. In particular, for PV units, first a sort of capability chart has been defined in order to investigate the possibility of such energy source of delivering both active and reactive power; then some effective control schemes have been proposed to make the PV units work at its Maximum Power Point (MPP) and also provide reactive power. Finally, the insertion of such controlled units into a MV distribution network has been considered together with the employment of a central controller which runs an optimization tool that establishes all the reference signals for the PV reactive powers in order to pursue a specific objective (Power Quality, Energy Efficiency, Dynamic Stability and so on). This research line has been conducted in cooperation with:

- STRI AB Ludvika (Prof. M.H.J. Bollen)

- Smart Grids: The study on the integration of Renewables into distribution electric networks has been the logical and natural connection to the topic of Smart Grids. In this context, a more recent research line has been opened in order to quantify the benefits provided by some different "smarting actions" in the transmission or distribution network. Different kinds of objectives have been considered: from the meeting of the EU 202020 goals to the satisfaction of static, harmonic and dynamic quality Key Performance Indicators (KPIs). Then the Project "Smart Polygeneration Microgrid (SPM)", financed by the Italian Ministry of Education, University & Research with 2.400.000,00 euro has allowed the possibility of starting a research project containing both the theoretical/simulation activity and the experimental validation of the developed models. In particular, an ad hoc Energy Management System (EMS) has been developed in order to optimise the energy production from the SPM with economical/environmental objectives. Future activity will imply the definition of suitable contour systems for Islanded Microgrids with the possibility of validating them on the SPM

- Advanced control theory: the necessity to define advanced control strategies for the integration of renewables into distribution grids has allowed to get a knowledge of some of the most effective non linear control techniques, like Feedback Linearization (FBL) and Sliding Modes (SM), which have been applied also to define some robust control algorithms for synchronous generators both in normal operation conditions and fault conditions.

Author or coauthor of 90 scientific publications and 2 patents.

TEACHING

Academic Year 2013-2014; 2014-2015

- Componenti e sistemi per la produzione elettrica, Ingegneria Industriale, 1st level degree (B.Sc.), University of Genoa;

Academic Year 2014-2015, 2013-2014, 2012-2013, 2011-2012:

- Power Systems Control and Optimization (in English), Environmental & Energy Engineering, 2nd level degree (M.Sc.), University of Genoa.

COOPERATION IN OTHER COURSES

Academic Year 2012-2013

Sistemi Elettrici per l'Energia, Ingegneria Industriale, 1st level degree (B.Sc.), University of Genoa;

Academic Years 2011-2012, 2010-2011:

- Sistemi Elettrici per l'Energia, Ingegneria Gestionale, 1st level degree (B.Sc.), University of Genoa;
- Componenti e Tecnologie per la Produzione Elettrica, Ingegneria Gestionale, 2nd level degree (M.Sc.) - orientation: Energy Management, University of Genoa;
- Ingegneria ed Economia dei Sistemi Elettrici, Ingegneria Gestionale, 2nd level degree (M.Sc.)- orientation: Energy Management, University of Genoa.

Academic Year 2009-2010:

- Sistemi Elettrici per l'Energia 1, Ingegneria Gestionale, 1st level degree (B.Sc.), University of Genoa;
- Componenti e Tecnologie per la Produzione Elettrica, Ingegneria Gestionale, 2nd level degree (M.Sc.) - orientation: Energy Management, University of Genoa;
- Gestione dei Sistemi Elettrici Civili ed Industriali, Ingegneria Gestionale, 2nd level degree (M.Sc.)- orientation: Energy Management, University of Genoa.

Academic Years 2008-2009, 2007-2008, 2006-2007, 2005-2006

- Sistemi Elettrici per l'Energia 1, Ingegneria Gestionale, 1st level degree (B.Sc.), University of Genoa;
- Sistemi Elettrici per l'Energia 2, Ingegneria Gestionale, 2nd level degree (M.Sc.) - orientation: Energy Management, University of Genoa;
- Gestione dei Sistemi Elettrici Civili ed Industriali, Ingegneria Gestionale, 2nd level degree (M.Sc.)- orientation: Energy Management, University of Genoa.
- Sistemi Elettrici per l'Energia 1, Ingegneria Elettrica, 2nd level degree (M.Sc.), University of Genoa;
- Sistemi Elettrici per l'Energia 2, Ingegneria Elettrica, 2nd level degree (M.Sc.), University of Genoa;

Academic Years 2004-2005, 2003-2004, 2002-2003, 2001-2002

- Sistemi Elettrici per l'Energia 1, Ingegneria Gestionale, 1st level degree (B.Sc.), University of Genoa;
- Sistemi Elettrici per l'Energia 2, Ingegneria Gestionale, 2nd level degree (M.Sc.) - orientation: Energy Management, University of Genoa;

Member of Scientific committee of Master “ATTIVITÀ DI MONTAGGIO E AVVIAMENTO DI IMPIANTI PER LA PRODUZIONE DI ENERGIA ELETTRICA”. In cooperation with Ansaldo Energia SpA, Fondazione Ansaldo.

Teaching at the Executive Master in Nuclear Plant Construction Management held by MIP (Politecnico di Milano).

RESEARCH PROJECTS AND CONTRACTS

Working on the following research project financed by the Italian Ministry of Education, University & Research and by the Italian Ministry of Environment:

- Project “Smart Polygeneration Microgrid (SPM)”, financed by the Italian Ministry of Education, University & Research with 2.400.000,00 euro. Description: the project SPM begun in 2010 as a joint special project in the energy sector between the University of Genoa and the Italian Ministry of Education, University and Research. It aims at the construction at Savona Campus facility of a low voltage smart microgrid demonstrator, composed of renewable energy units, CHP systems, electrical and thermal storage units, EV charging stations and other smart electrical devices (inverters, meters). During the year 2011 the preliminary design, the final design and the working plan of the SPM have been developed and in the current month of November 2012 works have been started. The expected date for the test-bed completion is June 2013. The project SPM is based on the use of both renewable and fossil sources to produce thermal and electrical energy in accordance to a distributed generation strategy. The SPM will allow to optimize the thermal and electrical energy consumptions of Savona Campus, minimizing the CO2 emissions, the annual operating costs and the primary energy use. SPM will be also a useful tool to connect academic research with private industrial companies and network operators (gas and electricity), in order to develop joint scientific program based on the demonstrator use.

Working on several research projects financed by Italian and foreign companies on subjects related to: electromagnetic transients in power systems, integration of renewables into the power delivery system, smart power grids. Among them, it is worth mentioning the following ones:

- Title: “Supporting the development of the European Electricity Grid Initiative (EEGI) Grid+”; Company: T&D Europe – The European Association of the Electricity Transmission and Distribution Equipment and Services Industry; Amount: 40.000,00 euro; Date: 01.10.2011; Duration: 3 years.

- Title: “Algoritmo di controllo per l’utilizzo degli impianti fotovoltaici connessi alle reti di distribuzione di energia elettrica come fornitori del servizio ancillare di compensazione reattiva”; Company: Elios Srl (a ligurian small enterprise operating in the photovoltaic sector); Amount: 53.000,00 euro; Date: 17.02.2011; Duration: 2 years.

- Title: “Servizio tecnico per lo studio degli effetti di sovratensioni di origine atmosferica sulla rete elettrica di trasmissione e identificazione di possibili contromisure a livello di sistema di protezione”; Company: TERNA – Italian Power Grid; Amount: 40.000,00 euro; Date: 30.07.2007; Duration: 6 months.

-Title: "Contratto di appalto per servizi specialistici di studio e ricerca su: studi e consulenze inerenti le problematiche di ripristino dei sistemi elettrici di potenza, studi e consulenze inerenti le tecniche di ottimizzazione dinamica dei sistemi di difesa, studi e consulenze inerenti il comportamento transitorio delle reti in regime elettromagnetico, seminari formativi presso CESI e presso cliente"; Company: CESI SPA; Amount: 91.156 euro; Date 16/09/2011; Duration: 1 year.

-Title: "PV Plants Reactive Power Management", Company: ABB SPA; Amount 31.500 euro; Duration: 2 year

Education and training

-First Certificate in English, 1991.

-Master of Science in Electrical Engineering (with honors), University of Genoa, 1999.

-Electrical Engineering Professional Qualification, University of Genoa, 1999.

-Diploma in guitar at the Conservatory of Cuneo G.F. Ghedini, 2000.

-PhD in Electrical Engineering, University of Genoa, 2004;

-Counselor degree in the Educational field, 2009

-Certified Transactional Analist degree, 2010

Mother tongue(s) | Italian

Other language(s) | English

Self-assessment	Understanding				Speaking				Writing	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
English	B2	Independent user	B2	Independent user	B2	Independent user	B2	Independent user	B2	Independent user

(*) Common European Framework of Reference for Languages

Computer skills and competences | Windows
Mathematical Computer Program: FORTRAN, MATLAB, MAPLE
Electrical engineering programs: CYME, DIGSILENT, PSCAD-EMTDC

Driving licence | Category B

Additional information

- Winner of Emerald Literati Awards' OutstandingPaperAccolade 2004 for the best paper appeared in 2003 held by "COMPEL – The International Journal for Computation&Mathematics in Electrical& Electronic Engineering".
- Invited in 2005 as "Lecturer" on "Models for the evaluation of lightning current and fields and for the field coupling to transmission lines" at the INTERNATIONAL LIGHTNING CENTER, Camp Blanding, Florida (USA).
- Reviewer of IEEE Transactions on Electromagnetic Compatibility

DATE 14/5/2015

SIGNATURE