Curriculum Vitae et Studiorum of Giovanni Spagnuolo

Giovanni Spagnuolo was born in Salerno (Italy) on 12 September 1967.

Studies

- He received the M.Sc. degree in Electronic Engineering from the University of Salerno (Italy) on April 5th, 1993.
- He received the Ph.D. degree in Electrical Engineering from the University "Federico II" of Naples in 1998.
- In 1998 and 1999 he received a Post Doctoral Scholarship from the University of Salerno.

Employment at the University of Salerno (Italy)

- From November 1999 to December 2003 he was Assistant Professor of "Elettrotecnica" (s.s.d. I-17-X)
- Since January 1st, 2004 he is Associate Professor of "Elettrotecnica" (ING-IND/31).

Memberships

- Since 1996 he is member of the "Ordine degli Ingegneri della Provincia di Salerno"
- Since 2010 he is Senior Member of the IEEE.

Editorial Activities

- Since January 2011 he has been serving as Editor of the IEEE Journal of Photovoltaics for the topic "PV system control"
- Since January 2007 he has been serving as Associate Editor of the IEEE Transactions on Industrial Electronics.
- From April 2008 to December 2012 he was Associate Editor of the International Journal of Industrial Electronics and Drives, Inderscience Publishers Ltd.
- He has been co-Guest Editor of four Special Issues of the IEEE Transactions on Industrial Electronics:
  - "Photovoltaic power processing systems" (July 2008)
  - "Efficient and reliable photovoltaic systems" (July 2009)
  - "Fuel cells power processing and control" (December 2009)
  - "Smart devices for renewable energy systems" (March 2013).

Funded Research Projects Coordination

International

- Progetto Vigoni 2008-2009 entitled "Circuiti elettronici di potenza ad alta efficienza ed affidabilità per il fotovoltaico" with ISET-University of Kassel (Germany), funded by Ateneo Italo Tedesco (Italian coordinator).
- Progetto Galileo 2012-2013 entitled "Rilievo di guasti in sistemi che sfruttano fonti energetiche rinnovabili: affidabilità e ottimizzazione" with ENSEM-Université de Lorraine (France), funded by Università Italo Francese (Italian coordinator).
- European Project Leonardo Da Vinci "Energy Conversion Systems and their Environmental Impact" (I/05/B/F/PP-154181) (2005-2007, Research Unit of the Department).
- European Project FP7 "DC/DC COnverter-based Diagnostics for PEM systems D-CODE" (2011-2013, Research Unit of the Department).

National

- PRIN 2008 "Celle a combustibile ad elettrolita polimerico con alimentazione diretta ad idrogeno: sviluppo di materiali ed ottimizzazione strutturale ed elettrica dei dispositivi" (national coordinator Prof.A.Stella, Research Unit of the Department).

Local

- Project funded by Campania Region, law 05/2002, entitled "Modelli, circuiti ed algoritmi per l'inseguimento del punto di massima potenza di impianti fotovoltaici in condizioni di mismatching", (call 2007, coordinator)
- Project for Young Researchers funded by the Università di Salerno in 2002: "Metodi innovative per il tolerance design".
- FARB (Fondo di Ateneo per la Ricerca di Base) projects funded by the Università di Salerno:
  - "Metodi innovativi per il progetto robusto di circuiti"
  - "Progetto ed ottimizzazione di un inverter fotovoltaico controllato secondo la logica "one cycle""
  - "Circuiti elettronici di potenza ad alta efficienza ed affidabilità per applicazioni fotovoltaiche"
  - "Circuiti elettronici di potenza e tecniche di controllo per celle a combustibile"
  - "Controllo granulare di sistemi fotovoltaici"

Private

- Project funded by National Semiconductors Corporation in Santa Clara (USA): "Reliability issues in micro-inverters for photovoltaic modules" (2008)
- Project funded by Matrix S.r.l. in Conversano (BA-Italy): "Sviluppo ed ottimizzazione di un caricabatterie boost per applicazioni fotovoltaiche di tipo stand-alone" (2008)
- Project funded by Bitron Industrie S.p.A. in Grugliasco (TO-Italy): "Analisi di circuiti elettronici di potenza per il controllo di singoli pannelli fotovoltaici, nonché studio di fattibilità di un apparato di illuminazione stradale che impieghi lampade LED alimentate da un sistema combinato fotovoltaico/eolico/accumulo" (2009)
- Project funded by Bitron Industrie S.p.A. in Grugliasco (TO-Italy): "Progetto di circuiti elettronici di potenza per applicazioni alle fonti energetiche rinnovabili" (triennial 2010-2013).

Patents

- L.Egiziano, N.Femia, D.Granozio, G.Petrone, G.Spagnuolo, M.Vitelli: "Dispositivo invertitore a singolo stadio, e relativo metodo di controllo, per convertitori di potenza da sorgenti di energia, in particolare sorgenti fotovoltaiche", Università di Salerno SA2005A000014 - 13.07.2005, PCT/IT2005/000747.
- A.Canova, D.Nocentini, S.Macerini, N.Femia, M.Vitelli, Spagnuolo G., Petrone G, F. De Rosa, A.Sirianni. "Un sistema di produzione di energia elettrica da fonti rinnovabili ed un metodo per il suo controllo", Magnetek S.p.A. PCT/IT2005/000757 22.12.2005, US Patent 7952897 - 31 May 2011.
- Luigi Egiziano, Nicola Femia, Giovanni Spagnuolo, Giovanni Petrone, Massimo Vitelli: "Apparato controllore ad inseguimento del punto di massima potenza di un sistema di generazione di potenza elettrica basato su sorgenti fotovoltaiche, metodo di controllo e relativo sistema di generazione di potenza elettrica (Teodi)", Università di Salerno RM2009000193 - 24.04.2009, PCT/IT2010/000167.
- Luigi Egiziano, Nicola Femia, Giovanni Spagnuolo, Giovanni Petrone, Massimo Vitelli: "Metodo di controllo di un sistema di generazione di potenza elettrica basato su sorgenti di energia, in particolare sorgenti di energia rinnovabile, e relativo dispositivo controllore", Università di Salerno SA2009A000004 - 20.02.2009, PCT/IT2010/000066.
- G.Spagnuolo, G.Petrone, M.Vitelli, P.Manganiello, P.L.Carotenuto, L.Cirillo, C.Cullino: "Metodo per la decimazione dei campioni necessary all'identificazione di una curva caratteristica di almeno un modulo di erogazione di energia elettrica e programma per elaboratore associato" - TO2013A000717 Bitron S.p.A. (submitted on 5 september 2013)

- G.Spagnuolo, G.Petrone, M.Vitelli, P.Manganiello, P.L.Carotenuto, L.Cirillo, C.Cullino: "Metodo per valutare la necessità di eseguire una fase di riconfigurazione di due o più pannelli fotovoltaici" - TO2013A000718 Bitron S.p.A. (submitted on 5 september 2013).

Invited Lectures

- "Maximizing the power production of a photovoltaic generator: power electronics and control strategies", Energy Day, in the frame of IEEE 14th IEEE International Conference on Emerging Techonologies and Factory Automation ETFA 2009, Palma De Maiorca (Spain), 22 september 2009.
- "Optimal control of photovoltaic arrays", Plenary Lecture in Electrimacs 2011, Paris, 6-8 June 2011.
- "Controllo non lineare di circuiti per applicazioni fotovoltaiche", ET2011 XXVII Riunione Annuale dei Ricercatori di Elettrotecnica, Bologna, 15-17 june 2011.
- "Real time techniques and architectures for maximizing the power produced by a photovoltaic array", Plenary Lecture in 22nd Italian Workshop on Neural Networks, May 17-19, 2012 Vietri sul Mare, Salerno, Italy.
- "Riconfigurazione dinamica di sistemi fotovoltaici", ET2013 XXIX Riunione Annuale dei Ricercatori di Elettrotecnica, Padova, june 2013.

Lectures given in foreign universities

- May 2011 - Eight hours in the Second Level Master "Photovoltaic devices and systems" organized by Institute of Microelectronics Technology of the University of the Basque Country (Spain)
- July 2011 - Invited Lecturer at Universitat Rovira i Virgili (Tarragona-Spain) Grant MAS2010-00675P Spanish Ministry of Education – eight hours on "Maximum power point tracking: main issues and algorithms" for Master and PhD students
- June 2014 – Erasmus Teaching Program at Université de Lorraine (Nancy-France) – five hours on "Photovoltaic systems: modeling and control" for Master and PhD students

PhD Committees final defense

- Indian Institute of Technology, Bombay - Dr.Patel Hirenkumar H. - November 2008
- Aalborg University - Dr. Dezo Sera - March 2009
- Universitat Rovira i Virgili - Dr. Carlos Andres Ramos Paja - July 2009
- Politecnico di Bari Commissione Giudicatrice Conseguimento Titolo - September 2009
- Université de Franche-Comté - Dr. Sebastien Wasterlain - January 2010
- Universidad de Sevilla - Dr. Alicia Arce Rubio - October 2010
- Università di Salerno - Commissione Giudicatrice Conseguimento Titolo - February 2011
- Université de Lorraine – Dr.Hugues Reneaudineau – October 2013
- Tampere University of Technology – Dr. Ansi Maki – November 2013

PhD Students Supervisor

- Mario Fortunato (2008-2010)
- Emilio Mamarelis (2010-2012)
- Pietro Luigi Carotenuto (2012-2014)
- Gerardo D'Elia (2012-2014)
- Mattia Ricco (2012-2014, co-tutorship with Université de Cergy Pontoise, France)
- J.D.Bastidas (2012-2014, co-tutorship with Universidad del Valle, Colombia)
- M.L.Orozco (2012-2014, co-tutorship with Universidad del Valle, Colombia)
- Adriana Trejos (2013-2015, co-tutorship with Universidad Nacional de Colombia, Medellin-Colombia)

Roles in Conferences Organization

- 2010 IEEE ISIE International Symposium on Industrial Electronics (Publicity Chair)
- Electrimacs 2011, Paris (Scientific Committee)
- 2012 International Power Electronics and Motion Conference and Exposition – EPE-PEMC 2012 (Technical Program Committee)
- 2012 IEEE ISIE International Symposium on Industrial Electronics (Track Chair – "Power Systems, PHEV, and Renewable Energy").
- 2013 IEEE ICIT International Conference on Industrial Technology (Track Chair "Renewable Energy Systems")
- Electrimacs 2014, Valencia (Tutorial Chair)
- 2014 IEEE ICIT International Conference on Industrial Technology (Program Chair)
- Chairman of IEEE Seminar on Renewable Energy Systems (SERENE), Salerno (Italy) 2009 and 2010.

Organization of Special Sessions in the frame of IEEE Conferences

- "Power Electronics for Photovoltaics" IEEE International Symposium on Industrial Electronics (ISIE), Vigo, June 2007;
- "Power electronics dedicated to a single photovoltaic module: grid-connected and stand-alone applications" IEEE International Conference on Industrial Technology (ICIT), Vina del Mar, Chile, March 2010;
- "Granular Control of Renewable Energy Systems" IEEE International Symposium on Industrial Electronics, Bari, July 2010;
- "Reliability and Performance Indexes of Renewable Energy Systems" IEEE International Symposium on Industrial Electronics, Bari, July 2010;
- "Increased Penetration of Sustainable Energy Sources into the Grid: Instruments and Effects" IEEE Industrial Electronics Conference, Phoenix, November 2010;
- "Smart devices for renewable energy systems" IEEE International Symposium on Industrial Electronics, Gdansk, July 2011;
- "Photovoltaic systems for building integration and sustainable mobility", 2012 International Power Electronics and Motion Conference and Exposition - EPE-PEMC 2012, Novi Sad, September 2012.

Reviewer of Research Projects

- In 2010 reviewer of one research project submitted to the United States-Israel Binational Science Foundation.
- In 2011 reviewer of one research project submitted to the Jordanian Scientific Research Support Fund (SRSF).

Other roles

- Since October 2012 Chairman of the "Technical Committee on Renewable Energy Systems" of the IEEE Industrial Electronics Society
- Since October 2012 member of the AdCom (Administrative Committee) of the IEEE Industrial Electronics Society
- Since January 2011 member of the Publications committee of the IEEE Industrial Electronics Society
- Since June 2014 Member of the IMACS Technical Committee on Modeling and Simulation of Electrical Machines (IMACS TC 1)
- From January to December 2010 Vice Director of the Department he belonged to.
- Since August 2010 member of the Patents Committee of the University of Salerno.

- Reference person for the Università di Salerno of two International Cooperation Agreements, with the Universidad del Valle (Cali-Colombia) and with Universidad Nacional de Colombia (Medellin-Colombia).
- Contact person for some Erasmus agreements with Université de Lorraine, Université de Franche Comté, Université de Cergy Pontoise, from France, Universidad de Sevilla, Universidad de Malaga, Universitat Rovira y Virgili, from Spain, Technical University of Tampere, from Finland.

Prizes

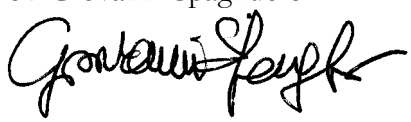
- Premio Projenius from ASSIPE (ASSociazione Italiana Progettazione Elettronica) for the project "Un kit fotovoltaico innovativo per applicazioni alla nautica ed alla mobilità sostenibile", in cooperation with CNR Parma, SOLON S.p.A. and Matrix S.r.l. - Ferrara, 17 September 2008 (prize for the realization of the photovoltaic plant of the 40 feet boat of Giovanni Soldini).

Teaching Activities

- IEEE Learning Library Course "Maximum Power Point Tracking (MPPT): Algorithms and Applications", publication year 2012.
- Since 2005 professor of "Elettrotecnica I" (6 CFU) and "Elettrotecnica II" (6 CFU) for the Mechanical Engineering Degree at the Università di Salerno.
- Since 2008 professor of the short course entitled "Tolerance analysis and design" (1 CFU) for the PhD students of the Dottorato di Ricerca in Ingegneria dell'Informazione, Università di Salerno.
- In the last ten years, professor of the following courses (for some years and together with other colleagues):
    - Elettronica di Potenza per le fonti rinnovabili (Electronic Engineering degree-6 of 6 CFU)
    - Elettronica di Potenza per il Fotovoltaico (Electronic Engineering degree-6 of 6 CFU)
    - Complementi di Elettrotecnica (Electronic Engineering degree-1.5 of 3 CFU))
    - Circuiti Elettronici di Potenza II (Electronic Engineering degree-2 of 6 CFU)
    - Intelligenza Energetica (Computer Engineering degree-3 of 6 CFU)
    - Elettrotecnica (Civil Engineering and Environmental Engineering degrees-6 of 6 CFU)).

September 6, 2014, Salerno, Italy

Prof. Giovanni Spagnuolo



List of publications

PhD Thesis in Electrical Engineering

t1. **G. Spagnuolo**: "Metodi Innovativi per lo Studio di Circuiti a Parametri Incerti: Analisi di Sensitività e Tolleranza", Tesi di Dottorato di Ricerca in Ingegneria Elettrotecnica, Università di Napoli "Federico II", Febbraio 1998.

Books

b1. **N. Femia, G. Petrone, G. Spagnuolo, M. Vitelli**: Power Electronics and Control Techniques for Maximum Energy Harvesting in Photovoltaic Systems, 1st Edition, CRC Press, 2012.

Book chapters

bc1. **G. Petrone, G. Spagnuolo**: "Solar Power Conversion", The Industrial Electronics Handbook, Edited by J . David Irwin Edited by J . David Irwin, CRC Press, ISBN: 978-1-4398-0285-4, February 2011.

bc2. **G.Petrone, F.J. Sanchez Pacheco, G.Spagnuolo**: "Real time techniques and architectures for maximizing the power produced by a photovoltaic array", Smart Innovation, Systems and Technologies, pp 239-257, Springer 2012, ISSN: 2190-3018, doi: 10.1007/978-3-642-35467-0_25.

Journal papers

j1. **N.Femia, G.Spagnuolo, V.Tucci**: "Interval Analysis in Power Electronics", Special Issue of the International Journal of Circuits Systems and Computers, Vol.5, No.3, September 1995, pp.317-336.

j2. **N.Femia, G.Spagnuolo, V.Tucci**: "State-Space Models and Order Reduction for DC-DC Switching Converters in Discontinuous Modes", IEEE Trans. on Power Electronics, Vol.10, No.6, November 1995, pp.640-650.

j3. **N.Femia, G.Spagnuolo**: "Genetic Optimization of Interval Arithmetic-Based Worst Case Circuit Tolerance Analysis", IEEE Trans. on Circuits and Systems - Part I, Vol.46, No.12, December 1999, pp.1441-1456.

j4. **N.Femia, G.Spagnuolo**: "True Worst-Case Circuit Tolerance Analysis Using Genetic Algorithm and Affine Arithmetic", IEEE Trans. on Circuits and Systems - Part I, Vol.47, No.9, September 2000, pp.1285-1296.

j5. **N.Femia, G.Spagnuolo, M.Vitelli**: "Steady state analysis of soft switching converters", IEEE Transactions on Circuits and Systems – Part I, Vol.49, No.7, July 2002, pp.939-954.

j6. **N.Femia, G.Spagnuolo, M.Vitelli**: "Unified analysis of synchronous commutations in switching converters", IEEE Transactions on Circuits and Systems – Part I, Vol.49, No.8, August 2002, pp.1150-1166.

j7. **N.Femia, G.Spagnuolo, M.Vitelli**: "Steady state analysis of pwm dc-to-dc regulators", IEEE Transactions on Aerospace and Electronic Systems, Vol.39, No.1, January 2003, pp.318-334.

j8. **N.Femia, G.Spagnuolo, M.Vitelli**: "Steady state analysis of hard and soft switching dc-to-dc regulators", IEEE Transactions on Power Electronics, Vol.18, No.1, January 2003, pp.51-64.

j9. **G.Spagnuolo**: "Tolerance design of magnetic devices by evolutionary algorithms", IEEE Transactions on Magnetics, Vol.39, No.5, September 2003, pp.2170-2178.

j10. **G.Petrone, G.Spagnuolo, M.Vitelli**: "Worst-case tolerance analysis in static field problems", IEEE Transactions on Magnetics, Vol.40, No.2, March 2004, pp.366-370.

j11. **B.De Vivo, G.Spagnuolo, M.Vitelli**: "Variability analysis of composite materials for stress relief in cable accessories", IEEE Transactions on Magnetics, Vol.40, No.2, March 2004, pp.418-425.

j12. **G.Petrone, G.Spagnuolo**: "Worst-case tolerance design of closed-loop controllers for dc-dc voltage switching regulators", IEEE Transactions on Aerospace and Electronic Systems, Vol.40, Issue 2, April 2004, pp.661-674.

j13. **N.Femia, G.Petrone, G.Spagnuolo, M.Vitelli**: "Optimization of Perturb and Observe Maximum Power Point Tracking Method", IEEE Transactions on Power Electronics, Vol.20, N.4, July 2005, pp.963-973.

j14. **G.Spagnuolo**: "Detection of acceptability regions by means of an interval arithmetic-based algorithm", The International Journal for Computation and Mathematics in Electrical and Electronic Engineering (COMPEL), Volume 25, Issue 4, pp.964-978, 2006.

j15. **N.Femia, D.Granozio, G.Petrone, G.Spagnuolo, M.Vitelli:** "Optimized One Cycle Control in Photovoltaic Grid Connected Applications", IEEE Transactions on Aerospace and Electronic Systems, Vol.42, No.3, July 2006, pp.963-973.

j16. **N.Femia, D.Granozio, G.Petrone, G.Spagnuolo, M.Vitelli:** "Predictive & Adaptive MPPT Perturb and Observe Method", IEEE Transactions on Aerospace and Electronic Systems, Vol.43, No.3, July 2007, pp.934-950.

j17. **G.Petrone, G.Spagnuolo, M.Vitelli:** "Analytical model of mismatched photovoltaic fields by means of Lambert W-function", Solar Energy Materials and Solar Cells, Vol.91, N.18, November 2007, pp.1652-1657.

j18. **L.Egiziano, P.Lamberti, G.Spagnuolo, V.Tucci**: "Robust Design of Electromagnetic Systems based on Interval Taylor Extension applied to a Multiquadric Performance Function", IEEE Transactions on Magnetics, Vol.44, No.6, June 2008, pp.1134-1137.

j19. **M.Fortunato, A.Giustiniani, G.Petrone, G.Spagnuolo, M.Vitelli**: "Maximum Power Point Tracking in a One Cycle Controlled Single Stage Photovoltaic Inverter", IEEE Transactions on Industrial Electronics, Vol.55, No.7, July 2008, pp. 2684 - 2693.

j20. **G.Petrone, G.Spagnuolo, R.Teodorescu, M.Veerachary, M.Vitelli**: "Reliability issues in photovoltaic power processing systems", IEEE Transactions on Industrial Electronics, Vol.55, No.7, July 2008, July 2008, pp. 2569 - 2580.

j21. **N.Femia, G.Lisi, G.Petrone, G.Spagnuolo, M.Vitelli**: "Distributed Maximum Power Point Tracking of Photovoltaic Arrays: novel Approach and System Analysis", IEEE Transactions on Industrial Electronics, Vol.55, No.7, July 2008, pp. 2610 - 2621.

j22. **A.De Nardo, N.Femia, M.Nicolò, G.Petrone, G.Spagnuolo**: "Power Stage Design of Fourth Order DC-DC Converters by means of Principal Components Analysis", IEEE Transactions on Power Electronics, Vol.23, No.6, November 2008, pp.2867-2877.

j23. **N.Femia, M.Fortunato, G.Petrone, G.Spagnuolo, M.Vitelli**: "Dynamic Model of One-Cycle Control for Converters Operating in Continuous and Discontinuous Conduction Mode", International Journal on Circuit Theory and Applications, 2009, Vol. 37, No.5, pp.:661-684.

j24. **N.Femia, G.Petrone, G.Spagnuolo, M.Vitelli**: "A Technique for Improving P&O MPPT performances of Double Stage Grid-Connected Photovoltaic Systems", IEEE Transactions on Industrial Electronics, Vol.56, No.11, November 2009, pp.4473-4482.

j25. **I.Arsie,A. Di Domenico, A.Giustiniani, G.Petrone, C.Pianese, M.Sorrentino, G.Spagnuolo, M.Vitelli**: "Enhancing Polymeric Electrolyte Membrane Fuel Cell Control by Means of the Perturb and Observe Technique", ASME Journal of Fuel Cell Science and Technology, Vol.7, February 2010.

j26. **C.A.Ramos-Paja, R.Giral, J.Romano, A.Romero, L.Martinez-Salamero, G.Spagnuolo**: "A PEM fuel cell model featuring oxygen excess ratio estimation and power electronics interaction", IEEE Transactions on Industrial Electronics, Vol.57, No.6, pp.1914-1924, June 2010.

j27. **A.De Nardo, N.Femia, G.Petrone, G.Spagnuolo**: "Optimal Buck Converter Output Filter Design for Point-of-Load Applications", IEEE Transactions on Industrial Electronics, Vol.57, No.4, pp.1330-1341, April 2010.

j28. **N.Femia, G.Petrone, G.Spagnuolo, M.Vitelli**: "A New Analog MPPT Technique: TEODI", Progress in Photovoltaics: Research and Applications, Vol.18, No.1, January 2010, pp.28-41.

j29. **A.Giustiniani, G.Petrone, G.Spagnuolo, M.Vitelli** "Low frequency current oscillations and maximum power point tracking in grid-connected fuel cell based system", IEEE Transactions on Industrial Electronics, Vol.57, No.6, June 2010, pp: 2042-2053.

j30. **G.Adinolfi, N.Femia, G.Petrone, G.Spagnuolo, M.Vitelli:** "Design of DC/DC converters for DMPPT PV applications based on the concept of energetic efficiency", ASME Journal of Solar Energy Engineering, Vol.132, No.2, May 2010.

j31. **G.Spagnuolo, G.Petrone, S.V.Araujo, C.Cecati, E.Friis-Madsen, E.Gubia, D.Hissel, M.Jasinski, W.Knapp, M.Liserre, P.Rodriguez, R.Teodorescu, P.Zacharias:** "Renewable energy operation and conversion schemes", IEEE Industrial Electronics Magazine, Vol.4, No.1, pp.38-51, March 2010.

j32. **G.Petrone, G.Spagnuolo, M.Vitelli**: "A Multi-Variable Perturb and Observe Maximum Power Point Tracking Technique Applied to a Single Stage Photovoltaic Inverter", IEEE Transactions on Industrial Electronics, Vol.58, No.1, pp.76-84, January 2011.

j33. **G.Petrone, G.Spagnuolo, M.Vitelli**: "Distributed Maximum Power Point Tracking: challenges and commercial solutions", Automatika – Journal for Control, Measurement, Electronics, Computing and Communications, Vol.53, No.2, pp.128-141, 2012.

j34. **G.Petrone, G.Spagnuolo, M.Vitelli**: "An analog technique for Distributed MPPT PV applications", IEEE Transactions on Industrial Electronics, Vol.59, No.12, pp. 4713 – 4722, December 2012.

j35. **R.Iannone, S.Miranda, S.Riemma, G.Spagnuolo**: "An integrated approach to the simulation/optimization of grid-connected photovoltaic systems: the rational choice of components", International Review of Electrical Engineering, Vol.7, No.3, pp. 4596-4606, June 2012.

j36. **E.Bianconi, J.Calvente, R.Giral, E.Mamarelis, G.Petrone, C.A.Ramos-Paja, G.Spagnuolo, M.Vitelli**: "A fast current-based MPPT technique employing sliding mode control", IEEE Transactions on Industrial Electronics, Vol.60, No.3, pp.1168-1178, March 2013.

j37. **G.Petrone, C.A.Ramos-Paja, G.Spagnuolo, M.Vitelli**: "Granular control of photovoltaic arrays by means of a multi-output Maximum Power Point Tracking algorithm", Progress in Photovoltaics: Research and Applications, Vol.21, No.5, pp.918–932, August 2013.

j38. **N.Femia, G.Petrone, G.Spagnuolo, M.Vitelli**: "Optimal Control of Photovoltaic Arrays", Mathematics and Computers in Simulation, Vol.91, pp.1-15, May 2013.

j39. **E.Mamarelis, G.Petrone, G.Spagnuolo:** "An hybrid digital-analog sliding mode controller for photovoltaic applications", IEEE Transactions on Industrial Informatics, Vol.9, No.2, pp.1094-1103, May 2013.

j40. **E.Bianconi, J.Calvente, R.Giral, E.Mamarelis, G.Petrone, C.A.Ramos-Paja, G.Spagnuolo, M.Vitelli**: "Perturb and Observe MPPT algorithm with a current controller based on the Sliding Mode", International Journal of Electrical Power and Energy Systems, Vol. 44, No.1, pp.346–356, January 2013.

j41. **W.Xiao, E.Fonkwe, G.Spagnuolo, J.Jatskevich**: "Efficient Approaches for Modeling and Simulating Photovoltaic Power Systems", IEEE Journal of Photovoltaics, Vol.3, No.1, pp. 500-508, January 2013.

j42. **J.D. Bastidas, E.Franco, G.Petrone, C.A.Ramos Paja, G.Spagnuolo**: "Modeling of photovoltaic fields in mismatching conditions with improved calculation speed", Electric Power Systems Research, Vol.96, pp.81-90, 2013.

j43. **M.L. Orozco-Gutierrez, J.M. Ramirez-Scarpetta, G.Spagnuolo, C.A.Ramos-Paja**: "A technique for mismatched PV array simulation", Renewable Energy, Vol. 55, July 2013, pp: 417–427.

j44. **E.Romero Cadaval, G.Spagnuolo, C.A. Ramos Paja, W.Xiao, T.Suntio, L.Franquelo**: "Grid Connected Photovoltaic Generation Plants. Components and Operation", IEEE Industrial Electronics Magazine, Vol.7, No.3, pp.6-20, 2013.

j45. **R.Giral, E.Mamarelis, G.Petrone, C.A. Ramos Paja, G.Spagnuolo, M.Vitelli:** "Reducing the hardware requirements in FPGA-based controllers: a photovoltaic application", Revista Facultad De Ingenieria-Universidad De Antioquia, No.68, pp:75-87, September 2013.

j46. **E.Mamarelis, G.Petrone, G.Spagnuolo**: "A two-steps algorithm improving the P&O steady state MPPT efficiency", Applied Energy, Volume 113, January 2014, Pages 414–421.

j47. **E.Mamarelis, G.Petrone, G.Spagnuolo**: "Design of a Sliding Mode Controlled SEPIC for PV MPPT Applications", IEEE Transactions on Industrial Electronics, Vol.61, No.7, pp.3387-3398, July 2014.

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j49. **J.D. Bastidas, E.Franco, G.Petrone, C.A.Ramos Paja, G.Spagnuolo**: "Maximum Power Point Tracking Architectures for Photovoltaic Systems in Mismatching Conditions: A Review", IET Power Electronics, Vol.7, No.6, pp.1396-1413, June 2014.

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