Phd Jelena LONCARSKI

CONTACT

E-mail: jelena.loncarski@poliba.it

RESEARCH INTERESTS

Power electronic circuits and power electronic converters for renewable energy sources and electrical drive

ACADEMIC APPOINTMENTS

Postdoctoral Researcher May 2019 – present

Dept. of Department of Electrical and Information Engineering, Polytechnic Univ. of Bari, ITALY

- Comparison and development of Multilevel Si-based and 2-level SiC MOSFET inverters for high-speed drives

Associate Editor April 2019 – present

IET Power Electronics

Visiting Researcher October 2016 – present

Department of Engineering Sciences, Division of Electricity, Uppsala University, SWEDEN

Collaborator- Researcher January 2018–March 2019

Dept. of Information Engineering, Faculty of Engineering, Polytechnic Univ. of Marche, ITALY

- Collaboration with the group of Vision, Robotics and Artificial Intelligence- Prof. Emanuele Frontoni

Postdoctoral Researcher March 2014–March 2016, Sept. 2016–Oct. 2016

Department of Engineering Sciences, Division of Electricity, Uppsala University, SWEDEN

- Magneto-Caloric project: *Development of Power Electronics Based Test Platform for Characterization and Testing of Magnetocaloric Materials*
- Lysekil Wave Energy Project: *Wave to Grid Power Conversion System*
- Analysis of the output current ripple in 2-level and multilevel inverters
- Supervisor: Prof. Mats Leijon

University Lecturer April 2016–June 2016

Department of Engineering Sciences, Division of Electricity, Uppsala University, SWEDEN

EDUCATION

University of Bologna,
Department of Electrical, Electronic, and Information Engineering
Bologna, ITALY

Power Electronics group: http://www.dei.unibo.it/en
Phd in Electrical Engineering:
www.die.ing.unibo.it/dottorato_it/index_en.htm, March 2014

- Thesis Topic: *Peak-to-peak output current ripple analysis in multiphase and multilevel inverters*

- Advisor: Professor Gabriele Grandi

Faculty of Electrical Engineering,
Department of Power Converters and Drives, Belgrade, SERBIA

Postgraduate studies – Master in Electrical Engineering, October 2007–April 2010

- Specialization in *Power Converters and Drives*
- Master Thesis Title: *Modelling and simulation of the electro-energetic systems*
- Advisor: Professor Zoran Lazarevic
- Projects: Energy efficient systems of lightning in buildings – DALI systems
- Advisor: Professor Miomir Kostic

Faculty of Electrical Engineering,
Department of Power Converters and Drives, Belgrade, SERBIA

Graduate studies – Bachelor in Electrical Engineering, October 2002–October 2007

- Specialization in *Power Converters and Drives*
- Bachelor Thesis Title: *Photovotaic systems for supplying with electric power*
- Advisor: Professor Zoran Radakovic
- Projects: Electrical installations in buildings
- Advisor: Professor Miomir Kostic

PARTICIPATION IN RESEARCH PROJECTS/INDUSTRIAL INNOVATION

Lysekil Wave Energy Project together with Seabased AB – company producing wave energy converters, Uppsala University, SWEDEN

March 2014–October 2016

- "Wave to Grid Power Conversion System"
  - Project leader: Prof. Mats Leijon.
  - Short Description: Investigation of the optimal grid connection strategies based on a smart modular power conversion system and efficient grid integration of the wave energy converters.

September 2016–October 2016

- "Wave to Grid full modelling"
  - Project leader: Prof. Mats Leijon.
  - Short Description: Matlab/Simulink modelling of the WECs (dynamic model of the generator) and the wave to grid system that can simulate the entire electric system including electric grid (acting as WEC emulator).

Magneto-Caloric Project, Uppsala University, SWEDEN

June 2014–April 2015

- "Development of Power Electronics Based Test Platform for Characterization and Testing of Magnetocaloric Materials"
  - Project leader: Prof. Mats Leijon, Prof. Sandra Eriksson.
  - Short Description: Development of the entirely new approach for characterization of the magnetocaloric materials, with the main focus on a flexible and efficient power electronic based excitation and a completely static test platform.

INTERNATIONAL COLLABORATION

Marie Curie H2020 , UNIBO, ITALY

September 2017

- Leader of the project submitted to Horizon H2020 MSCA-IF-EF-ST "Quasi-Stand-Alone Photovoltaic Charging Station for Electric Vehicles – QSAPCS-EVs" with collaboration of University of Bologna, Department of Electrical, Electronic, and Information Engineering-Unibo, Italy, and Mälardalen University (MDH), Sweden.

ERC Starting Grant H2020 , UNIBO, ITALY

October 2017

- Leader of the project submitted to Horizon H2020 ERC-2018-STG "Electric Vehicles Charging Stations Based on Reconditioning of Existing Photovoltaics Plants – EVCS-REPP" with collaboration of University of Bologna, Department of Electrical, Electronic, and Information Engineering-Unibo, Italy, and Mälardalen University (MDH), Sweden.

IoT4 Industry, UNIVPM, ITALY

December 2018

- Leader of the project submitted to Horizon H2020 sub-call IoT4Industry "IoT based Smart Charger for Electric Vehicles – IoT SMARTEVs" with collaboration of School of Electrical Engineering, University of Belgrade – ETF, TESO-SME Serbia, MAC-Italia – SME Italia.

BOOK CHAPTERS

B.1. **Jelena Loncarski**: Peak-to-peak output current ripple analysis in multiphase and multilevel inverter, published with *Springer Theses*, recognizing the outstanding PhD research, ISBN: 978-3-319-07251-7, May 2014.

REFEREED JOURNAL PUBLICATIONS

J.1. G. Grandi, **J. Loncarski**, "Analysis of peak-to-peak current ripple amplitude in seven-phase PWM voltage source inverters", Energies, 6, ISSN 1996–1073, 2013.

J.2. G. Grandi, **J. Loncarski**, "Simplified implementation of optimised carrier-based PWM in three-level inverters", IET Electronics Letters, vol. 50, no. 8, pp. 631-633, April 2014.

J.3. G. Grandi, **J. Loncarski**, O. Dordevic, "Analytical evaluation of output current ripple amplitude in three-phase three-level inverters", IET Power Electronics, August 2014.

J.4. G. Grandi, **J. Loncarski**, O. Dordevic, "Analysis and Comparison of Peak-to-Peak Current Ripple in Two-Level and Multilevel PWM Inverters," IEEE Trans. on Industrial Electronics, vol. 62, no. 5, pp. 2721-2730, May 2015.

J.5. D.E. Soman, **J. Loncarski**, L. Gerdin, P. Eklund, S. Eriksson, M. Leijon, "Development of Power Electronics Based Test Platform for Characterization and Testing of Magnetocaloric Materials," Advances in Electrical Engineering, vol. 2015, Article ID 670624, 7 pages, 2015.

J.6. **J. Loncarski**, M. Leijon, M. Srndovic, C. Rossi, G. Grandi, "Comparison of Output Current Ripple in Single and Dual Three-Phase Inverters for

Electric Vehicle Motor Drives," Energies, vol. 8, no. 5: pp. 3832-3848, May 2015.

J.7. G. Grandi, **J. Loncarski**, M. Srndovic, "Analysis and Minimization of Output Current Ripple for Discontinuous Pulse-Width Modulation Techniques in Three-Phase Inverters," Energies, vol. 9, no. 5, May 2016.

J.8. Pierdicca Roberto, Frontoni Emanuele, Zingaretti Primo, Mancini Adriano, **Loncarski Jelena**, and Paolanti Marina. 2019. Design, Large-Scale Usage Testing, and Important Metrics for Augmented Reality Gaming Applications. ACM Trans. Multimedia Comput. Commun. Appl. 15, 2, Article 41 (June 2019), 18 pages.

J.9. Luca Romeo, **Jelena Loncarski**, Marina Paolanti, Gianluca Bocchini, Adriano Mancini, Emanuele Frontoni, Machine learning-based design support system for the prediction of heterogeneous machine parameters in industry 4.0, Expert Systems with Applications, vol. 140, 2020, 112869, ISSN 0957-4174.

J.10. **J. Loncarski**, V.G. Monopoli, R. Leuzzi, L. Ristic, F. Cupertino, Analytical and Simulation Fair Comparison of Three Level Si IGBT Based NPC Topologies and Two Level SiC MOSFET Based Topology for High Speed Drives. Energies 2019, 12, 4571.

CONFERENCE PUBLICATIONS

C.1. G. Grandi, **J. Loncarski**, "Analysis of dead-time effects in multi-phase voltage source inverters," in Proc. of IET Power Electronics, Machines and Drives (PEMD), Bristol (UK), CD-ROM paper 0223, 2012.

C.2. G. Grandi, **J. Loncarski**, "Space vector analysis of dead-time voltage distortion in multiphase inverters," in Proc. of 15th Power electronics and Motion Control Conference (EPE-PEMC), Novi Sad (RS), Sept. 4-6, 2012.

C.3. G. Grandi, **J. Loncarski**, R. Seebacher, "Effects of current ripple on dead-time distortion in three phase voltage source inverters," in Proc. of IEEE Energy Conference (ENERGYCON), Florence (IT), 9–12 Sept. 2012.

C.4. G. Grandi, **J. Loncarski**, "Evaluation of current ripple amplitude in three-phase PWM voltage source inverters," in Proc. of 8th IEEE International Conference-Workshop on Compatibility and Power Electronics (CPE), Ljubljana (SLO), 5-7 June 2013.

C.5. G. Grandi, **J. Loncarski**, "Evaluation of current ripple amplitude in five-phase PWM voltage source inverters," in Proc. of IEEE Conference on ICT , Power engineering, and Signal processing (EUROCON), Zagreb (CRO), 1–4 July 2013.

C.6. G. Grandi, **J. Loncarski**, C. Rossi, "Comparison of peak-to-peak current ripple amplitude in multiphase PWM voltage source inverters," in Proc. of 15th IEEE Conf. on Power Electronics and Applications (EPE'13 ECCE Europe), Lille (FR), 3–5 Sept 2013.

C.7. **J. Loncarski**, O. Dordevic, G. Grandi, "Experimental Verification of Current Ripple Amplitude in Five-Phase PWM VSIs," in Proc. of 39th Annual Conference of the IEEE Industrial Electronics Society, Wien (Austria), 10-13 Nov. 2013.

C.8. G. Grandi, **J. Loncarski**, "Implementation of carrier-based optimized centered PWM in three-phase three-level inverters," in Proc. Of International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM), Ischia (IT), 18-20 June 2014.

C. 9. **J. Loncarski**, M. Leijon, C. Rossi, M. Srndovic, G. Grandi, "Current Ripple Evaluation in Dual Three-Phase Inverters for Open-End Winding EV Drives," in Proc. of 3rd IEEE Int. Conf. on Connected Vehicles and Expo (ICCVE), Wien (AU), 3-7 Nov. 2014.

C.10. S. Padmanaban, G. Grandi, F. Blaabjerg, **J. Loncarski**, P. W. Wheeler, "A Simple MPPT Algorithm for Novel PV Power Generation System by High Output Voltage DC-DC Boost Converter," in Proc. of International Symposium on Industrial Electronics (ISIE), Rio de Janeiro (BR), 3-5 June 2015.

C.11. D. E. Soman, **J. Loncarski**, M. Srndovic, M. Leijon, "DC-Link Stress Analysis for the Grid Connection of Point Absorber Type Wave Energy Converters," in Proc. of 5th IEEE Int. Conf. on Clean Electrical Power, (ICCEP), Taormina, Sicily (IT), 16-18 June 2015.

C.12**. J. Loncarski**, D. E. Soman and E. Frontoni, "Interconnection strategies of point absorber type wave energy converters and rectifier units," 2018 18th International Conference on Harmonics and Quality of Power (ICHQP), Ljubljana, 2018, pp. 1-6.

C.13. M. Paolanti, L. Romeo, A. Felicetti A. Mancini, E. Frontoni, **J. Loncarski** "Machine Learning approach for Predictive Maintenance in Industry 4.0," The 14th IEEE/ASME International Conference on Mechatronic and Embedded Systems (MESA), Oulu (FI), 2-4 July 2018.

C.14. E. Frontoni, **J. Loncarski**, R. Pierdicca, M. Bernardini, M. Sasso, "Cyber Physical Systems for Industry 4.0: Towards Real Time Virtual Reality in Smart Manufacturing," In: De Paolis L., Bourdot P. (eds) Augmented Reality, Virtual Reality, and Computer Graphics. AVR 2018. Lecture Notes in Computer Science, vol 10851. Springer, Cham

C.15. L. Romeo, M. Paolanti, G. Bocchini, **J. Loncarski**, E. Frontoni" An innovative Design Support System for Industry 4.0 based on machine learning approaches," 5th International Symposium on Environment Friendly Energies and Applications (EFEA 2018), Rome (IT), 24-26 Sept. 2018.

C.16. **J. Loncarski**, V.G. Monopoli, R. Leuzzi, F. Cupertino, Operation analysis and comparison of Multilevel Si IGBT and 2-level SiC MOSFET inverter-based high-speed drives with long power cable. In Proceedings of 2019 IEEE International Conference on Clean Electrical Power (ICCEP), Otranto, IT 2019.

C.17. **J. Loncarski**, V.G. Monopoli, R. Leuzzi, F. Cupertino, Operation analysis and comparison of T-type NPC Si IGBT and SiC MOSFET inverter-based high-speed drives. Submitted to 45th Annual Conference of the IEEE Industrial Electronics Society, (IECON), Lisbon Portugal, 14-18 Oct 2019.

INVITED PRESENTATIONS/ SEMINARS

P.1. J. Loncarski, "Comparison of Peak-To-Peak Output Current Ripple Amplitude in Multilevel Inverters", Department of Electrical Energy Conversion, School of Electrical Engineering KTH Royal Institute of Technology, 18th Oct 2013

S.1. J. Loncarski, "Intellipower for Sustainable Growth", Dept. of Information Engineering, Faculty of Engineering, Polytechnic Univ. of Marche UNIVPM, 22nd March 2017.

S.2. J. Loncarski, "How to write scientific article", Dept. of Information Engineering, Faculty of Engineering, Polytechnic Univ. of Marche UNIVPM, 17th October 2018.

STUDENT ADVISING

Co-supervising Department of Electrical, Electronic, and Information Engineering, University of Bologna

Chen Peng, 2011

Master Thesis Student; in cooperation with Emerson (Chloride) Bologna and part of AlmaTong international degree:

Thesis title: "Analysis of deadtimes and its compensation in voltage source inverters"

Lu Disen, 2011

Master Thesis Student; Department of Electrical, Electronic, and Information Engineering, University of Bologna

Thesis title: "Analysis of parallel connection of voltage source inverters"

Supervising Department of Engineering Sciences, Division of Electricity, Uppsala University**:**

Jon Gezelius, October 2014 – March 2015

Project work student

Lisa Gerdin, June– August 2014

Summer worker student

TEACHING EXPERIENCE

Department of Engineering Sciences, Division of Electricity, Uppsala University, Sweden

Course responsible, teacher and examiner for:

- Inverter design with applications 1TE673 (2016; master course)

Department of Engineering Sciences, Division of Electricity, Uppsala University, Sweden

Teaching Assistant

Tutorials, lab, semester project instructor and grader for:

- Inverter design with applications 1TE673 (2014 – 2015; master course)
- Power electronics 1TE046 (2014 – 2016; master course)

PROFESSIONAL EXPERIENCE

Dept. of Department of Electrical and Information Engineering, Polytechnic Univ. of Bari, Italy

Postdoctoral Researcher **May 2019 – present**

– "Comparison and development of Multilevel Si-based and 2-level SiC MOSFET inverters for high-speed drives"

Dept. of Information Engineering, Faculty of Engineering, Polytechnic Univ. of Marche, Italy

Collaborator- Researcher **January 2018 – March 2019**

- Funding: Visiting Researcher scholarship, UNIVPM

– Collaboration with the group of Vision, Robotics and Artificial Intelligence- Prof. Emanuele Frontoni

Department of Engineering Sciences, Division of Electricity, Uppsala University, Sweden

Postdoctoral Researcher **Mar. 2014–Mar. 2016, Sept. 2016–Oct. 2016**

- Funding: Carl Tryggers Stiftelse, Magnetocaloric project at UU, UU

- "Development of Power Electronics Based Test Platform for Characterization and Testing of Magnetocaloric Materials"
- "Lysekil Wave Energy Project: Wave to Grid Power Conversion System"
- "Analysis of the output current ripple in 2-level and multilevel inverters"
- Supervisor: Professor Mats Leijon

- Teaching and supervising student activities.

Department of Engineering Sciences, Division of Electricity, Uppsala University, Sweden

University Lecturer **April 2016–June 2016**

- Teaching *Inverter design with applications* 1TE673 course and supervising activities.

Schneider Electric DMS Group, Novi Sad, Serbia - *Research and Development Company for Smart GRID Solutions*

Engineer **July 2009 – January 2011**

- Part of the team for power management system (PMS), a software which ensures reliable energy supply for energy-intensive industries.

GIK "Banat " AD, Zrenjanin, Serbia - *Civil Engineering Company*

Engineer **August 2008 – June 2009**

- Leader of a team for electrical installations in buildings.
- Supervision of the installation activities.
- Material purchasing.

Me.Com, Belgrade, Serbia – *Company for the Design of El. Installations*

Engineer **Dec. 2007– March 2008.**

- Technical preparation and design of electrical installations.

REFEREE SERVICE

Journals:

- IEEE Transactions on Power Electronics
- IEEE Transactions on Industrial Electronics
- IET Power Electronics
- IEEE Transactions on Industry Applications
- MDPI Energies
- International Journal of Electronics
- Advances in Power Electronics Hindawi

Conferences:

- GreeNets 2018
- EFEA 2018
- ECCE 2019
- ICHQP 2018
- PEMC2016
- ICIT 2015

HARDWARE AND SOFTWARE SKILLS

Multilevel Power Converters, Smart Grids, Wave Energy, Magnetocaloric Test Platform.

Matlab, Simulink, OrCAD, SPICE, Microsoft Office (Word, Excel, PowerPoint), AutoCad, C, Pascal, Fortran etc.

AWARDS AND SCHOLARSHIPS

Erasmus Mundus (JoinEU-SEE project)

- Erasmus funding for doctoral studies (2011 – 2014) – JoinEU-SEE grant holder, co-financed by European Commission; www.joineusee.eu

Institute of Advanced Studies ISA Unibo

- Fellowship at the Institute of Advanced Studies (2011 – 2014); www.ias.unibo.it

Marco Polo exchange grant Unibo

- Marco Polo exchange grant with TU Graz, Austria
  Project title: Simulation and experimental investigation of nonlinearities in voltage source inverters and identification of compensation methods
  Foreign Tutor: proff. Annette Mütze and Roland Seebacher (EAM – TU Graz, Austria).

Visiting Scientist Scholarship

- Visiting Scientist Scholarship within UNIVPM
  Project title: eHealth Services for Intelligent Oncology Telecare

PARENTAL/OTHER LEAVE

Parental leave: July 2015 – April 2016.