

Sobhan Mohamadian

RTDA, Ph.D

Conducting both educational (teaching Electrical Machine and Industrial Electronics courses) and research activities (industrial projects in the field of Power Electronics and Renewable Energy Sources) at University of L'Aquila since Feb. 2022.



Università degli Studi dell'Aquila, Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica, Via Vetoio, 67100 L'Aquila - Italy



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EDUCATION

Ph.D. in Electrical Engineering
September 23, 2010 - May 31, 2016

Iran University of Science and Technology, Tehran/Iran

Thesis: Control Improvement of Five-Phase Synchronous Machine Fed by Load-Commutated Current-Source Inverter. The focus was on the modelling and control of high-power multiphase thyristor-based current-source inverters (CSI). Also, a fully thyristorized multilevel CSI was implemented to improve drive performance in terms of starting, lower torque pulsations, and lower stator THD current.
Supervisor: Prof. Abbas Shoulaie

M.Sc. in Electrical Engineering – Power Electronics and Electrical Machine Drives
September 23, 2007 - 28 September 2010

Iran University of Science and Technology, Tehran/Iran

Thesis: Modeling of a High Current Converter with Variable AC and DC Output Voltage. An 80 kVA AC/DC converter comprising of AC/AC regulator, star-zigzag transformer and half-bridge diode rectifier was implemented with water-cooled press-pack diodes and an output of 5 kA was tested at the output. AC/AC regulator and diode rectifier with cooling system was designed and implemented.
Supervisor: Prof. Abbas Shoulaie

B.Sc. in Electrical Power Engineering
September 23, 2003 - September 22, 2007

Iran University of Science and Technology, Tehran/Iran

Thesis: Placement of Static Var Compensator (SVC) in Power Systems. The effect of different SVC locations on the dynamic stability was studied through simulations in MATLAB/SIMULINK.
Supervisor: Senior Lecturer Ahad Kazemi

RESERCH EXPERIENCE

Semnan Province Electric Power Distribution Company, Semnan, Iran (February 23, 2020 – August 26, 2021)

- Design and Implementation of Single-Phase Smart PV Inverter for Grid-Connected Applications. A kW-range HERIC type (transformer-less) inverter and DC/DC boost converter were built to inject the photovoltaic power to the grid.

NIDEC-ASI (Ansaldo Sistemi Industriali), Milan, Italy (February 1, 2014 - February 1, 2015)

- Modeling and Field Measurements on High-power asymmetric six-phase Load Commutated Inverter (LCI)-Fed Synchronous Motor (SM) Drives. An analytical approach was proposed to estimate the line-to-line voltages of SM fast and accurate for different working conditions and DC-link inductor connection of the two LCIs.

MAPNA Electric & Control Engineering & Manufacturing Company (MECO), Karaj, Iran (April 21, 2015 - September 19, 2016)

- Consultant in the Power System Emulator (PSE) Project. A hardware-in-the-loop (HIL) was designed using LabVIEW and MATLAB/SIMULINK to test the performance of a real 1518-kW exciting system in a complete power system model.

Parsian Gas refinery Company, Mehr, Iran (March 9, 2017 - September 22, 2018)

- Investigation into the Effect of Generated Harmonics of LED Lamps on the Electric Grid (Case Study of Parsian Gas Refinery Company).

Niroom Research Institute (NRI), Tehran, Iran (July 23, 2018 - March 20, 2021)

- Design and Implementation of B-H Meter for Soft Magnetic Materials. Multilevel Asymmetric Cascaded H-Bridge Converter was implemented to provide a nearly sinusoidal output. The DC-link voltages were controlled by buck-boost converters.

PUBLICATIONS

<https://scholar.google.com/citations?user=IOrsQNQAAAAAJ&hl=en>

❖ Selected Journal Articles

1. **Sobhan Mohamadian**, Hamidreza Pairo, and Amir Ghasemian, "A Straightforward Quadrature Signal Generator for Single-Phase SOGI-PLL with Low Susceptibility to Grid Harmonics," *IEEE Transactions on Industrial Electronics*, vol. 69, no. 7, pp. 6997-7007, Jul. 2022.
2. H. Azizi Moghaddam, A. Farhadi, and **S. Mohamadian**, "Non-linearity effects of industrial loads on induction motor servo drive system," *Iranian Journal of Electrical and Electronic Engineering (IJEED)*, vol. 18, no. 2, Jun. 2022.
3. H. Azizi-Moghaddam, M. H. Saeedinia, **Sobhan Mohamadian**, M. S. Mahdavi, and G. B. Gharehpetian, "Integrated Modeling of Power Network and Connected Flywheel Energy Storage System for Optimal Power and Energy Ratings of Flywheel" *IEEE Transactions on Energy Conversion*, vol. 36, no. 3, pp. 1589-1599, Sept. 2021.
4. **S. Mohamadian**, H. Azizi-Moghaddam, "Conduction and Dead-Time Voltage Drops Estimation of Asymmetric Cascaded H-Bridge Converters Utilizing Level-Shifted PWM Scheme" *Iranian Journal of Electrical and Electronic Engineering (IJEED)*, vol. 16, no. 1, pp. 48-57, Mar. 2020.
5. S. M. Seyyedzadeh, **S. Mohamadian**, M. Siami and A. Shoulaie, "Modeling of the Nonlinear Characteristics of Voltage Source Inverters for Motor Self-Commissioning," *IEEE Transactions on Power Electronics*, vol. 34, no. 12, pp. 12154-12164, Dec. 2019.

6. A. Parizad, **S. Mohamadian**, M. E. Iranian, and J. M. Guerrero, "Power system real/time emulation: a practical virtual instrumentation to complete electric power system modelling," *IEEE Transactions on Industrial Informatics*, vol. 15, no. 2, pp. 889-900, Feb. 2019.
7. **S. Mohamadian**, S. Castellan, A. Tesserolo, M. H. Khanzade, and A. Shoulaie, "A novel thyristor-based CSI topology with multilevel current waveform for improved drive performance," *IEEE Transactions on Power Electronics*, vol. 33, no. 2, pp. 997-1006, Feb. 2018.
8. M. Ghorbani, A. Mosallanejad, and **S. Mohamadian**, "A new method to point of common coupling voltage control in distribution grid-connected photovoltaic systems," *International Transactions on Electrical Energy Systems*, vol. 28, 2018.
9. **S. Mohamadian**, A. Tesserolo, S. Castellan, and A. Shoulaie, "Steady-state simulation of LCI-fed synchronous motor drives through a computationally-efficient algebraic method," *IEEE Transactions on Power Electronics*, vol. 32, no. 1, pp. 452-470, Jan. 2017.
10. **S. Mohamadian**, M. H. Khanzade, "A five-level current-source inverter for grid-connected or high-power three-phase wound-field synchronous motor drives," *Engineering, Technology & Applied Science Research*, vol. 6, no. 5, pp. 1139-1148, Oct. 2016.
11. **S. Mohamadian**, S. Castellan, A. Tesserolo, G. Ferrari, and A. Shoulaie, "An algebraic algorithm for motor voltage waveform prediction in dual-LCI drives with interconnected DC-links," *IEEE Transactions on Energy Conversion*, vol. 31, no. 2, pp. 506-519, Jun. 2016.
12. A. Tesserolo, **S. Mohamadian**, and M. Bortolozzi, "A new method for determining the leakage inductances of a nine-phase synchronous machine from no-load and short-circuit tests," *IEEE Transactions on Energy Conversion*, vol. 30, no. 4, pp. 1515-1527, Dec. 2015.
13. M. M. Shahroudi, **S. Mohamadian**, M. S. Naderi, and F. Mahdavi-zadeh, "A novel reference current generation strategy for multifunction DG-grid interface, using C-RLS algorithm," *International Transactions on Electrical Energy Systems*, vol. 25, no. 11, pp. 2877-2896, Nov. 2015.
14. A. D. Kolagar, **S. Mohamadian**, and A. Soulaie, "Unbalance assessment and apparent power decomposition in the electric system of interharmonic producing loads," *International Transactions on Electrical Energy Systems*, vol. 24, no. 2, pp. 246-263, Feb. 2014.
15. **S. Mohamadian**, and A. Shoulaie, "Comprehensive definitions for evaluating harmonic distortion and unbalanced conditions in three and four-wire three-phase systems based on IEEE standard 1459," *IEEE Transactions on Power Delivery*, vol. 26, no. 3, pp. 1774-1782, Jul. 2011.

❖ Selected Conference Papers

1. **S. Mohamadian** and C. Cecati, "Modelling, harmonic compensation, and current sharing between winding sets of asymmetric nine-phase PMSM," *IECON 2021 – 47th Annual Conference of the IEEE Industrial Electronics Society*, 2021, pp. 1-6.
2. S. Tedeschini, **S. Mohamadian**, and C. Cecati, "A multi-phase multilevel powertrain for full electric aircraft," *IECON 2021 – 47th Annual Conference of the IEEE Industrial Electronics Society*, 2021, pp. 1-6.
3. **S. Mohamadian**, M. Pazoki, and Reza Jalilzadeh Hamidi, "LCL Filter Design for Single-Phase Grid-Connected PV Inverters with Double-frequency Unipolar PWM Switching," *IEEE PES General Meeting*, July 2021.
4. H. Azizi-Moghaddam, **S. Mohamadian**, and R. Nasiri-Zarandi "Adaptive vector control of induction motor based inverse dynamic dynamometer," 11th Int. Conf. Power Electronics, Drive Systems and Technologies (PEDSTC), Tehran (Iran), Feb. 2020.
5. A. Parizad, H. R. Baghaee, **S. Mohamadian**, A. Yazdani, G. B. Gharehpetian and J. M. Guerrero, "A Laboratory Set-Up for Real-Time Power System Simulation using LabVIEW and NI PXI Hardware," 2019 *IEEE Power & Energy Society General Meeting (PESGM)*, Atlanta, GA, USA, 2019, pp. 1-5.

6. **S. Mohamadian** and A. Tassarolo “Improvement fault tolerance of multiphase LCI-fed synchronous motor drives,” in Proc. 18th *Int. Conf. Environmental and Electrical Engineering (EEEIC)*, Palermo (Italy), June 2018.
7. **S. Mohamadian**, “A novel flux observer and switching scheme for LCI/fed synchronous motor drives,” in Proc. 8th *Int. Conf. Power Electronics, Drive Systems and Technologies (PEDSTC)*, Mashhad (Iran), Feb. 2017.
8. **S. Mohamadian**, M. H. Khanzade, S. Castellán, and A. Tassarolo, “LCI-fed wound-field synchronous motors: A technology status review and new development trends,” in *AEIT Annual Conference - From Research to Industry: The Need for a More Effective Technology Transfer (AEIT)*, Sep. 2014, Italy, pp. 1–6.
9. **S. Mohamadian**, A. Tassarolo, and A. Shoulaie, “Design of an efficient starting circuit for LCI-fed synchronous motor drives,” in Proc. 5th *Int. Conf. Power Electronics, Drive Systems and Technologies (PEDSTC)*, Tehran (Iran), Feb. 2014, pp. 31-36.
10. **S. Mohamadian**, A. Tassarolo, and A. Shoulaie, “Field oriented control of LCI-fed WFSM drives in stator flux reference frame,” in Proc. 5th *Int. Conf. Power Electronics, Drive Systems and Technologies (PEDSTC)*, Tehran (Iran), Feb. 2014, pp. 19-24.
11. **S. Mohamadian**, R. Ghandehari, and A. Shoulaie, “A Comparative study of AC/DC converters used in high current applications,” in Proc. 2nd *Power Electronic, Drive Systems and Technologies Conference (PEDSTC)*, Tehran, Feb. 2011, pp. 604-609.
12. R. Ghandehari, **S. Mohamadian**, and A. Shoulaie, “A new approach to AC/DC converters modelling in time domain for harmonic analysis,” in Proc. 1st *Power Quality Conference (PQC)*, Tehran, 2011.
13. M. T. Kenari, **S. Mohamadian**, and A. Shoulaie, “A new concept in evaluating power system distortions under unbalanced and nonsinusoidal conditions,” in Proc. 9th *IEEE Int. Conf. Environment and Electrical Engineering (EEEIC)*, Prague, 2010, pp. 179-182.
14. **S. Mohamadian** and A. Shoulaie, “A novel AC/DC converter for high current and low voltage applications,” in Proc. 1st *Power Electronic, Drive Systems and Technologies Conference (PEDSTC)*, Tehran, Feb. 2010, pp. 152-156.