



Sajjad Mohammadi

Research Assistant at EMTRL [\[Link\]](#)

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EDUCATION

- Sep 2011 **M.S. Degree**
-Feb 2014 **Electrical Engineering**, Electrical Engineering Department, **Amirkabir University of Technology (Tehran Polytechnic)**, Tehran 15916, Iran.
GPA: A ; Hons.
Thesis title: Novel Eddy-Current Coupler Topologies: Modeling, Design, Optimization, Prototyping, Identification and DSP-based Speed Control.
(written in both **English and Persian**; 11 chapters; received **Nationwide Best M.Sc. Thesis Award** from **IEEE Iran section**, among all electrical engineering majors/ all Universities in Iran)
Supervisor: Prof. Mojtaba Mirsalim (Amirkabir University of Technology)
Adviser: Prof. Sadegh Vaez-Zadeh (University of Tehran)
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- Feb 2008 **B.S. Degree**
-Sep 2011 **Electrical Engineering**, Energy Department, **Kermanshah University of Technology**, Kermanshah, Iran.
GPA: A ; First Class Hons.
Thesis title: Modeling and Simulation of Bisotun Power Plant.
Supervisor: Dr. Reza Keyhani (Kermanshah University of Technology).

HONORS & AWARDS

- Dec. 2014 **Best M.Sc. Thesis Award in Electrical Engineering Department** from **Amirkabir University of Technology**.
- May 2014 **M.Sc. Best Thesis Award** from **IEEE Iran Section (Nationwide)**; out of all electrical engineering majors/ all Universities in Iran). [\[Link\]](#)
- 2013 Recognized as "**Exceptional Talent**" by "**National Organization for Exceptional Talents**" of Iran.
- 2011 Entrance to Amirkabir University of Technology for M.Sc. degree as **Honor Student**. (without Nationwide University Entrance Exam)
- 2007-2011 **First Class Honors** in B.Sc. degree (Out of about 100 students).
- 2010 **1st Place**, Humanoid Robot League, **12th Khwarizmi Youth Award (KYA)** & International AUTCUP 2010 **Robotics Competitions**, Tehran, Iran. (Awarded by Minister of Higher Education & Chancellor of Amirkabir University of Technology)
- 2010 **1st Place**, Technical Challenge, International AUTCUP 2010 **Robotics Competitions**, Tehran, Iran. (Awarded by Chancellor of Amirkabir University of Technology)
- 2010 **3rd Place**, Poster Challenge, National **Chem-E-Car Competition**, Razi University, Kermanshah, Iran.

- 2010 **2nd Place**, Humanoid Robot League, Iran Open 2010 International **RoboCup Competitions & Symposium**, Tehran, Iran.
- 2010 **1st Place**, Technical Challenge, Iran Open 2010 International **RoboCup Competitions & Symposium**, Tehran, Iran.
- 2010 **Awarded** by Chancellor of Kermanshah University of Technology for effective cooperation in **2nd National Conference on Energy, Fuel & Environment**.
- 2010 **Awarded** by Chancellor of Kermanshah University of Technology for cooperation in **Movement Festival**, held by Ministry of Higher Education.
- 2009 **5th Place**, Performance Challenge, 2nd International **Chem-E-Car Competition**, **McGill University**, Canadian Society for Chemical Engineering (CSChE), Montreal, **Canada**.
- 2009 **2nd Place**, Performance Challenge, National **Chem-E-Car Competition**, Sharif University of Technology, Tehran, Iran.
- 2009 **Awarded** by Chancellor of Kermanshah University of Technology for Active & Effective attendance in **Research Week Exhibition**.
- 2006 **1st Place**, **Physics Lab Competition**, Province stage, High School Education, Kermanshah, Iran.

RESEARCH EXPERIENCE

- 2012-present **Research Assistant**, at **Electrical Machines & Transformer Research Laboratory (EMTRL)**, Electrical Eng. Dep., Amirkabir University of Technology, Tehran. [\[Link\]](#)
- 2014 Experimental Project: **DSP-based Speed Control of a Wound-Excited Eddy-Current Coupler by a Buck Converter (Chapter 8 of My M.Sc. Thesis)** at Electrical Machines & Transformer Research Laboratory (**EMTRL**), Electrical Eng. Dep., Amirkabir University of Technology, Tehran. ([The corresponding papers to be prepared](#)) [\[Link\]](#)
- 2014 Experimental Project: **Modeling, Design and Prototyping a Novel Hybrid-Excited Eddy-Current Coupler** at Electrical Machines & Transformer Research Laboratory (**EMTRL**), Electrical Eng. Dep., Amirkabir University of Technology, Tehran. ([The corresponding patent and papers to be prepared](#)) [\[Link\]](#)
- 2014 Experimental Project: **Design and Prototyping a Novel 5-Phase Switched Reluctance Motor with Improved Torque Density (Cooperation in M.Sc. thesis of Eng. Gholamreza Davarpanah, under supervision of Prof. Mirsalim)** at Electrical Machines & Transformer Research Laboratory (**EMTRL**), Electrical Eng. Dep., Amirkabir University of Technology, Tehran. ([The corresponding patent and papers to be prepared](#)) [\[Link\]](#)
- 2014 Experimental Project: **Modeling, Design and Prototyping a Novel Radial-Flux Interior Double-Sided Permanent-Magnet Eddy-Current Coupler (Chapter 7 of My M.Sc. Thesis)** at Electrical Machines & Transformer Research Laboratory (**EMTRL**), Electrical Eng. Dep., Amirkabir University of Technology, Tehran. ([The corresponding patent and papers to be prepared](#)) [\[Link\]](#)
- 2014 Experimental Project: **Modeling, Design and Prototyping a Novel 8/10 Switched Reluctance Motor with Efficiently Reduced Core Losses (Cooperation in M.Sc. thesis of Eng. Gholamreza Davarpanah, under supervision of Prof. Mirsalim)** at Electrical Machines & Transformer Research Laboratory (**EMTRL**), Electrical Eng. Dep., Amirkabir University of Technology, Tehran. ([The corresponding patent and papers to be prepared](#)) [\[Link\]](#)
- 2013 Experimental Project: **Modeling, Design and Prototyping a Novel Axial-Flux Wound-Excited Eddy-Current Coupler with Capability of Speed Control (Chapter 8 of My M.Sc. Thesis)** at Electrical Machines & Transformer Research Laboratory (**EMTRL**), Electrical Eng. Dep., Amirkabir University of Technology, Tehran. ([The corresponding patent and papers to be prepared](#)) [\[Link\]](#)
- 2013 Experimental Project: **Modeling, Design and Prototyping a Novel Radial-Flux Interior PM Eddy-Current Coupler (Chapter 6 of My M.Sc. Thesis)** at **Finite Element Research Laboratory (FERL)** & Electrical Machines & Transformer Research Laboratory (**EMTRL**), Electrical Eng. Dep., Amirkabir University of Technology, Tehran. ([The corresponding patent and papers to be prepared](#)) [\[Link\]](#)

- 2013 Experimental Project: **Modeling, Design and Prototyping a Novel Axial-Flux Interior PM Eddy-Current Coupler (Chapter 5 of My M.Sc. Thesis)** at Electrical Machines & Transformer Research Laboratory (**EMTRL**), Electrical Eng. Dep., Amirkabir University of Technology, Tehran. [\[Link\]](#)
- 2013 Experimental Project: **Modeling, Design and Prototyping an Axial-Flux Surface-Mounted PM Eddy-Current Coupler (Chapter 4 of My M.Sc. Thesis)** at Electrical Machines & Transformer Research Laboratory (**EMTRL**), Electrical Eng. Dep., Amirkabir University of Technology, Tehran. [\[Link\]](#)
- 2011 **Research Project**, my B.Sc. thesis in *Bistoon Thermal Power plant*, Bistoon, Kermanshah, Iran.
- 2010-2011 **Research Project** at **Linear Control Lab** & Effective Participation in the two projects, Energy Dep., Kermanshah University of Technology.
- 2010-2011 Effective Participation in the project "*Generation of Electric Power Using fixed bicycles*", Energy Dep., Kermanshah University of Technology.
- 2010 Participation in the project "*Design & Manufacturing a simple vertical wind turbine*", Energy Dep., Kermanshah University of Technology.
- 2009-2010 **Research Project** at **Electronic Circuits Lab, Member of Robotics Team** & Effective Participation in the project "**Improving the performance of humanoid robots**", Energy Dep., Kermanshah University of Technology.
- 2008-2010 **Research Project** at **Electronic Circuits Lab** and **Chemistry Lab, Member of Chem-E-Car Team** and Effective Participation in several "**Chem-E-Car Manufacturing**" Projects, Energy Dep., Kermanshah University of Technology.

TEACHING EXPERIENCE

- Fall 2012 **Teaching Assistant**, the course "Electric Machinery II", Electrical Engineering Dep., Amirkabir University of Technology.
- Fall 2010 **Teaching Assistant**, the course "Linear Control Systems", Energy Dep., Kermanshah University of Technology.
- 2008 **Teaching Matlab/Simulink**, Energy Dep., Kermanshah University of Technology.

INSTITUTIONAL EXPERIENCE

- 2014-present Member, **IEEE Young Professionals**.
- 2014-present Member, **IEEE Industrial Electronics Society**.
- 2013-present Student Member, **IEEE**.
- 2008-2009 Secretary & Member of **Electrical Engineering Scientific Association (EESA)**, Energy Dep., Kermanshah University of Technology.

PUBLICATIONS

❖ **h-index: 4** [\[Link\]](#)

Journal Papers

- [J6] **S. Mohammadi**, M. Mirsalim, S. Vaez-Zadeh, and H.A. Talebi, 'Analytical Modeling and Analysis of Axial-Flux Interior Permanent-Magnet Couplers', *IEEE Transactions on Industrial Electronics*, vol. 61, no. 11, pp. 5940-5947, November 2014. [\(ISI\)](#)
- [J5] **S. Mohammadi**, and M. Mirsalim, 'Analytical Design Framework for Torque and Back-EMF Optimization, and Inductance Calculation in Double-Rotor Radial-Flux Air-Cored Permanent-Magnet Synchronous Machines', *IEEE Transactions on Magnetics*, vol. 50, no. 1, January 2014. [\(ISI\)](#)
- [J4] **S. Mohammadi**, M. Mirsalim, and S. Vaez-Zadeh, 'Nonlinear Modeling of Eddy-Current Couplers', *IEEE Transactions on Energy Conversion*, vol. 29, no. 1, pp. 224-231, March 2014. [\(ISI\)](#)

- [J3] **S. Mohammadi**, B. Vahidi, M. Mirsalim, and H. Lesani, 'Simple Nonlinear MEC-Based Model for Sensitivity Analysis and Genetic Optimization of Permanent-Magnet Synchronous Machines', *COMPEL: The International Journal for Computation and Mathematics in Electrical and Electronic Engineering*, vol. 24, no. 1, 2015. (ISI)
- [J2] **S. Mohammadi**, and M. Mirsalim, 'Design Optimization of Double-Sided Permanent-Magnet Radial-Flux Eddy-Current Couplers', *Elsevier: Electric Power Systems Research*, vol. 108, pp. 282-292, 2014. (ISI)
- [J1] **S. Mohammadi**, and M. Mirsalim, 'Double-Sided Permanent-Magnet Radial-Flux Eddy-Current Couplers: Three-Dimensional Analytical Modeling, Static and Transient Study, and Sensitivity Analysis', *IET Electric Power Applications*, vol. 7, no. 9, pp. 665–679, 2013. (ISI)

Conference Papers

- [C8] **S. Mohammadi**, H. A. Talebi, M. A. Soleimani, M. Mirsalim, S. Asgari, 'A Soccer Playing Humanoid Robot: Design, Algorithm and Prototype', accepted in *The 2nd International Conference on Robotics and Mechatronics (ICRoM 2014)*, Tehran, Iran (will be indexed by IEEE Explore).
- [C7] **S. Mohammadi**, M. Mirsalim, S. Vaez-Zadeh, and H. A. Talebi, 'Design Analysis of a New Axial-Flux Interior Permanent-Magnet Coupler', in *Proc. The 5th Power Electronics, Drive Systems and Technologies Conference (PEDSTC 2014)*, Tehran, Iran, pp. 562-567 (indexed by IEEE Explore).
- [C6] **S. Mohammadi**, M. Mirsalim, S. Vaez-Zadeh, and H. Lesani, 'Sensitivity Analysis and Prototyping of a Surface-Mounted Permanent-Magnet Axial-Flux Coupler', in *Proc. The 5th Power Electronics, Drive Systems and Technologies Conference (PEDSTC 2014)*, Tehran, Iran, pp. 568-573 (indexed by IEEE Explore).
- [C5] **S. Mohammadi**, M. Mirsalim, H. Rastegar, H. Lesani, and B. Vahidi, 'A Neural Network Based Saturation Model for Dynamic Modeling of Synchronous Machines', in *Proc. The 5th Power Electronics, Drive Systems and Technologies Conference (PEDSTC 2014)*, Tehran, Iran, pp. 334-339 (indexed by IEEE Explore).
- [C4] A. Vakilian-Zand, **S. Mohammadi**, J. S. Moghani, and M. Mirsalim, 'Sensitivity Analysis and Performance Optimization of an Industrial Squirrel-Cage Induction Motor Used for a 150 HP Floating Pump', in *Proc. The 5th Power Electronics, Drive Systems and Technologies Conference (PEDSTC 2014)*, Tehran, Iran, pp. 579-584 (indexed by IEEE Explore).
- [C3] **S. Mohammadi**, M. Mirsalim, M. Niazazari, and H. A. Talebi, 'A New Interior Permanent-Magnet Radial-Flux Eddy-Current Coupler', in *Proc. The 5th Power Electronics, Drive Systems and Technologies Conference (PEDSTC 2014)*, Tehran, Iran, pp. 500-505 (indexed by IEEE Explore).
- [C2] M. Niazazri, M. Mirsalim, and **S. Mohammadi**, 'Analytical Framework for Analysis and Demagnetization Study of a Slotted Solid-Rotor Line-Start Permanent-Magnet Synchronous Motor', in *Proc. The 5th Power Electronics, Drive Systems and Technologies Conference (PEDSTC 2014)*, Tehran, Iran, pp. 494-499 (indexed by IEEE Explore).
- [C1] M. Niazazri, M. Mirsalim, and **S. Mohammadi**, 'Effect of Rotor Slots Parameters on Synchronization Capability of Slotted Solid Rotor Line Start Permanent Magnet Motor', in *Proc. The 5th Power Electronics, Drive Systems and Technologies Conference (PEDSTC 2013)*, Tehran, Iran, pp. 60–65 (indexed by IEEE Explore).

PATENTS

- [P1] S. Mohammadi, A. Vakilian-Zand, M. Mirsalim, J. S. Moghani, 'An Interior Permanent-Magnet Eddy-Current Coupler for Contactless Torque Transfer Applications Having Low Vibrations such as Wind Turbines, Pumps and Working with Toxic Materials', *Iranian patent*, 2014. (Scientifically approved by National Organization for Exceptional Talents of Iran) [\[Link\]](#)

FIELDS OF INTERESTS

- ❖ Design, modeling, FE analysis, optimization, prototyping, real-time monitoring, DSP-based control and drive of electric machines; Power electronics; High Voltage Technology; Power systems; Renewable energies
- ❖ Robotics; control systems; Microcontrollers; Electronic Circuits Design; Teamwork

LANGUAGES

- ❖ Persian (Native)
- ❖ English (TOEFL & GRE)
- ❖ French (Elementary)

COMPUTER SKILL

- ❖ **General:** Microsoft Office.
- ❖ **Programming Language:** C, C++, AVR Microcontroller languages (Bascom & Code vision).
- ❖ **Engineering Software:** Matlab/Simulink (main interest), Ansoft Maxwell, Infolytica Magnet, Pspice, Altium Designer, Proteus, Robotis. Co. humanoid robot software.

HOBBIES

- ❖ Picnic, mountain, soccer, swimming, hiking, gardening, literature, music, museums, movies.

REFERENCES



Dr. Mojtaba Mirsalim (My M.S. Thesis Supervisor)

Professor, Department of Electrical Engineering, **Amirkabir University of Technology**, Tehran, Iran; also, engineering department, **St. Mary's University**, TX, USA.

B.S. & M.S.: University of California, Berkley; **Ph.D.:** Oregon State University, Corvallis.

Senior Member, IEEE; founder and director of the Electrical Machines and Transformers Research Laboratory, Amirkabir University of Technology;

Email: mirsalim@aut.ac.ir, mojtaba_mirsalim@yahoo.com, homepage: <http://ele.aut.ac.ir/mirsalim>



Dr. Sadeq Vaez-Zadeh (My M.S. Thesis Advisor)

Professor, Department of Electrical Engineering, School of Engineering, **University of Tehran**, Tehran, Iran.

B.S.: Iran University of Science and Technology, Tehran; **M.S. & Ph.D.:** Queen's University, ON, Canada.

Senior Member, IEEE; Editor, IEEE Transactions on Energy Conversion; *Editor*, International Journal on Power System Optimization; *Editor*, Journal of Faculty of Engineering; Founder and director of the Advanced Motion Systems Research Laboratory, university of Tehran;

Email: vaezs@ut.ac.ir, homepage: <http://ece.ut.ac.ir/faculty/vaez-zadeh>



Dr. Javad Shokrollahi Moghani (My M.S. Thesis Referee)

Associate Professor, Department of Electrical Eng., **Amirkabir University of Technology**, Tehran, Iran.

B.S. & M.S.: University of South Bank Polytechnic, Loughborough, England; **Ph.D.:** Bath University, Bath, England.

Director of the Finite Element Research Laboratory, Amirkabir University of Tcehnology.

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Dr. Behrooz Vahidi

Professor, Department of Electrical Engineering, **Amirkabir University of Technology**, Tehran, Iran.

B.S.: Sharif University of Technology, Tehran, Iran; **M.S.:** Amirkabir University of Technology, Tehran, Iran; **Ph.D.:** UMIST, U.K.

Director of the High Voltage Research Laboratory, Amirkabir University of Tcehnology.

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