Abbas Shiri

[CURRICULUM VITAE]

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Research Interests:

- **Electrical Machine Design and Modeling**
- **Linear Electric Machines**
- **Electromagnetic Systems and actuators**
- **Power Electronics and Drives**
- **Design of Electrical Insulations for High Voltages**

Publications:

Book

No.	Title	Authors	Publication
1	Linear induction motors, analysis, design and modeling (in Persian)	**A. Shiri** and A. Shoulaie	Shahid Rajaee University Press, 2016

Journal Papers

1 S. Fattahpour Roushan, **A. Shiri** and P. Naderi, "Design and Optimization of Linear Synchronous Motors for Transportation Applications", accepted for publication in Scientia Iranica, 2024.

2 **A. Shiri** and A. Tessarolo, "Normal Force Elimination in Single-Sided Linear Induction Motor Using Design Parameters", IEEE Transactions on Transportation Electrification, Vol. 9, No. 1, pp. 394-403, March 2023.

3 S. Niknafs, **A. Shiri**, S. Bagheri, "Design and optimization of air-cored double-sided linear permanent magnet generators for wave energy conversion", Energy Science and Engineering, Wiley, Vol. 10, No. 12, Dec. 2022.

4 S. Niknafs, **A. Shiri**, S. Bagheri, "Modeling and Analysis of Flat Double-sided Linear Permanent Magnet Synchronous Generator by Magnetic Equivalent Circuit", Journal of Electrical and Computer Engineering Innovations (JECEI), Vol. 10, No. 1, Jan. 2022.

5 M. Heidari, P. Naderi and **A. Shiri**, "Modeling and analysis of a multi-segmented linear permanent-magnet synchronous machine using a parametric magnetic equivalent circuit", Springer, Electrical Engineering, Vol. 140, pp. 705-715, 2022.

6 M. Rostami, P. Naderi and **A. Shiri**, "Modelling and analysis of permanent magnet Vernier machine using flexible magnetic equivalent circuit method", IET Science, Measurement & Technology, Vol. 16, No. 3, May 2022.

7 M. Heidary; V. Nekoukar; P. Naderi; **A. Shiri**, "Convolutional Neural Network for Ladder-Secondary Linear Induction Motor Fault Diagnosis", Scientia Iranica, Articles in Press, Available Online from 22 August 2022.

8 M. Rostami, P. Naderi and **A. Shiri**, "Modeling and detection of demagnetization fault in permanent magnet Vernier machine using flexible magnetic equivalent circuit method", Scientia Iranica, Articles in Press, Available Online from 25 December 2021.

9 M. Rostami, P. Naderi and **A. Shiri**, "Intern-turn fault modeling and diagnosis in permanent magnet vernier machine using modified magnetic equivalent circuit method", COMPEL-The International Journal for Computation and Mathematics in Electrical and Electronic Engineering, Vol. 41, No. 1, 2021.

10 M. Rostami, P. Naderi and **A. Shiri**, "Modeling and analysis of variable reluctance resolver

Cooperation with International Journals

- Reviewer of IEEE Transactions on Energy Conversion (Best reviewer award in 2020)
- Reviewer of IEEE Transactions on Transportation electrification
- Reviewer of IEEE Transactions on Industrial Electronics
- Reviewer of IEEE Transactions on Vehicular Technology
- Reviewer of IET electric power applications
- Reviewer of IEEE Transactions on Magnetics
- Reviewer of the Applied Computational Electromagnetics Society Journal
- Reviewer of Progress in Electromagnetics Research
- Reviewer of European Transactions on Electrical Power

using magnetic equivalent circuit", COMPEL-The International Journal for Computation and Mathematics in Electrical and Electronic Engineering, Vol. 40, No. 4, 2021.
11 M. Rostami, P. Naderi and **A. Shiri**, "Modeling and Analysis of Single-sided Linear Primary Permanent Magnet Vernier Machine", Scientific Journal of Applied Electromagnetics, Vol. 8, No. 1, pp. 61-67, Sep. 2020.
12 K. Hassanpour B. and **A. Shiri,** "A New Combined Method for Future Energy Forecasting in Electrical Networks", International Transactions on Electrical Energy Systems, Vol. 29, No. 3, March 2019.
13 **A. Shiri** and M. Allahyari, "Sensitivity Analysis and Optimization of Railguns Using Circuit Model", IEEE Transactions on Plasma Science, Vol. 47 No. 11, 2019.
14 S. Ghanadi and **A. Shiri**, "Design and optimization of linear induction motor to improve performance and starting conditions", Journal of Iranian Association of Electrical and Electronics Engineers Vol. 16, No. 3, 2019.
15 M Allahyari, **A Shiri**, "Modeling of Electromagnetic Railgun and Analysis of its Performance", Scientific Journal of Applied Electromagnetics, Vol. 7, No. 1, pp. 61-72, Nov. 2019.
16 P. Naderi and **A. Shiri**, "Modeling of Ladder-Secondary-Linear Induction Machine Using Magnetic Equivalent Circuit", IEEE Transactions on Vehicular Technology, Vol. 67, No. 12, pp. 11411-11419, Dec. 2018.
17 P. Naderi and **A. Shiri**, "Rotor/Stator Inter-Turn Short Circuit Fault Detection for Saturable Wound-Rotor Induction Machine by Modified Magnetic Equivalent Circuit Approach", IEEE Transactions on Magnetics, Vol. 53, No. 7, July 2017.
18 P. Naderi and **A. Shiri**, "Pole Arc Skewing Analysis of Synchronous Reluctance Machine, Using Discrete Method Combined with Winding Function Approach", The Applied Computational Electromagnetics Society Journal, Vol. 30, No. 7, July 2015.
19 **A. Shiri** and A. Shoulaie, "Optimal design of low-speed secondary-sheet single-sided linear induction motor", Journal of Electrical Engineering and Technology, Vol. 8, No. 3, pp.: 581-587, 2013.
20 **A. Shiri** and A. Shoulaie, "Design optimization and analysis of single-sided linear induction motor, considering all Phenomena", IEEE Transactions on Energy Conversion, Vol. 27, No. 2, June 2012.
21 **A. Shiri** and A. Shoulaie, "End effect braking force reduction in high-speed single-sided linear induction machine", Energy Conversion and Management, Elsevier, Volume 61, 2012.
22 **A. Shiri** and A. Shoulaie, "Investigation of frequency effects on the performance of single-sided linear induction motor", The Applied Computational Electromagnetics Society Journal, Vol. 27, No. 6, June 2012.
23 **A. Shiri** and A. Shoulaie, "Multi-objective optimal design of low-speed linear induction motor using genetic algorithm", Journal of Electrical Review, Vol. 88, No. 3b, pp: 185-191, March 2012.
24 **A. Shiri**, M. R. A. Pahlavani, A. Shoulaie, "Secondary back-iron saturation effects on thrust and normal force of single-sided linear induction motor", Advanced Computational Techniques in Electromagnetics, 2012, doi: 10.5899/2012/acte-00111.
25 **A. Shiri** and D. E. Moghadam, "Analytical and FEM based calculation of electromagnetic forces exerted on cylindrical coils due to their own current", The Applied Computational Electromagnetics Society Journal, Vol. 27, No. 11, November 2012.
26 **A. Shiri**, "Robust sliding mode control of electromagnetic suspension system with parameter uncertainty", Research Journal of Applied Sciences, Engineering and Technology, Vol. 4, No, 12, June 2012.
27 **A. Shiri**, H. P. Nabi and A. Shoulaie, "Experimental and analytical parameter sensitivity analysis of indirect field oriented control of induction machine", International Journal on Technical and Physical Problems of Engineering, Vol. 4, No. 2, June 2012.
28 **A. Shiri**, A. Gholami and A. Shoulaie, "Investigation of the ambient temperature effects on transformer's insulation life", Electrical Engineering, Springer, No. 93, pp: 193-197, 2011.
29 **A. Shiri** and A. Shoulaie, "Analysis of the frequency effects on design and back-iron characteristics of double-layer secondary single-sided linear induction motors", Amirkabir Journal of Science and Technology, Electrical and Electronics Engineering, Vol. 43, No. 1, Fall 2011.
30 **A. Shiri** and A. Shoulaie, "Calculation of magnetic forces between spiral coils using concentric rings", The Applied Computational Electromagnetics Society Journal, Vol. 25, No .5, May 2010.
31 M. R. Alizadeh Pahlavani, **A. Shiri**, H. A. Mohammadpour and A. Shoulaie, "Inductance measurement and magnetic flux density analysis of modular toroidal coil using FEM approach applicable to tokamak reactors", International Review of Electrical Engineering, Vol. 5, No. 1, Jen. /Feb. 2010.
32 **A. Shiri,** D. E. Moghadam, M. R. Alizadeh Pahlavani and A. Shoulaie, "Finite element based

analysis of magnetic forces between planar spiral coils", Journal of Electromagnetic Analysis and Applications, Vol. 2, No. 5, May 2010.

33 M. R. Alizadeh Pahlavani, **A. Shiri**, "Impact of dimensional parameters on mutual inductance of individual toroidal coils using analytical and finite element methods applicable to tokomak reactors", Progress In Electromagnetics Research B, Vol. 24, 2010.

34 M. R. Alizadeh Pahlavani, **A. Shiri**, and A. Shoulaie, "Numerical and experimental analysis of electromagnetic torque for modular toroidal coil applicable to tokomak reactors", Progress in Electromagnetics Research M, Vol. 12, 2010.

35 **A. Shiri** and A. Shoulaie, "A new methodology for magnetic force calculations between planar spiral coils", Progress in Electromagnetics Research, PIER, Vol. 95, pp: 39-57, 2009.

36 **A. Shiri**, M. R. Alizadeh Pahlavani and A. Shoulaie, "A new and fast procedure for calculation of the magnetic forces between cylindrical coils", International Review of Electrical Engineering, Vol. 4, No. 5, September/October 2009.

International Conference Papers

1 S. F. Roushan, **A. Shiri**, "A New Method for Designing DC-Excited Linear Synchronous Motor", 11th Power Electronics, Drive Systems, and Technologies Conference, Tehran, Iran, Feb. 2020.

2 M. Rostami, P. Naderi and **A. Shiri**, "Analysis of linear primary permanent magnet Vernier machine using finite element method", 11th Power Electronics, Drive Systems, and Technologies Conference, Tehran, Iran, Feb. 2020.

3 **A. Shiri**, "Electromagnetic Force Analysis in Linear Induction Motors, Considering End Effect", 7th Power Electronics, Drive Systems and Technologies Conference, Iran University of Science and technology, Tehran, Iran, February 2016.

4 **A. Shiri**, "A New Dynamic Model for Linear Induction Motors, Considering End Effect", The 10th International Symposium on Linear Drives for Industry Applications, Aachen, Germany, July 2015.

5 **A. Shiri**, "Normal Force Analysis in Secondary Sheet Single-Sided Linear Induction Motor", The 10th International Symposium on Linear Drives for Industry Applications, Aachen, Germany, July 2015.

6 S. Sadr, D. Arab Khaburi, **A. Shiri**, D. E. Moghadam, "Modeling of wheel and rail slip and demonstration of the benefit of maximum adhesion control in train propulsion system", IEEE International Conference on Industrial Electronics, Istanbul, June 2014.

7 D. E. Moghadam, **A. Shiri**, S. Sadr, D. Arab Khaburi, "A practical method for calculation of overexcited region in the synchronous generator capability curves", IEEE International Conference on Industrial Electronics, Istanbul, June 2014.

8 D. Esmaeil Moghadam, **A. Shiri** and M. Ali Mohammadi, "Investigation of the effect of important indices in insulation process on stator winding capacitance", 3rd Conference on Rotating Equipments in Oil and Power Industries, Tehran, January 2012(in Persian).

9 D. Esmaeil Moghadam and **A. Shiri**, "Investigation for Short Rise Time Surges Effects on Electric Motors Stator Insulation Condition", 3rd Conference on Rotating Equipments in Oil and Power Industries, Tehran, January 2012(in Persian).

10 **A. Shiri** and A. Shoulaie, "Design Optimization of Single-Sided Linear Induction Motors for Optimized Performance and Reduced End Effect Breaking Force", 27th Int. International Power System Conf, Tehran, Iran, October 2012(in Persian). Selected as "Best Paper Award" by the conference technical committee.

11 **A. Shiri** and A. Shoulaie, "Optimal Design of Single-Sided Linear Induction Motors Using Genetic Algorithm", 19th Iranian Electrical Engineering Conference, Tehran, Iran, May 2011(in Persian).

12 D. Esmaeil Moghadam and **A. Shiri**, "Investigation of the Effect of Preheating and

Pressure on Insulation Quality in VPI Process", 19th Iranian Electrical Engineering Conference, Tehran, Iran, May 2011(in Persian).

13 D. Esmaeil Moghadam and **A. Shiri**, "Non-Uniform Distribution of Voltage among Bar Turns in Electrical Feed Drive Motors Due to Short Rise Time Surges", 3rd Iranian Power Plants Conference, Tehran, February 2010(in Persian).

14 M. R. alizadeh Pahlavani, **A. Shiri** and A. Shoulaie, "3-D analysis of magnetic flux density in modular toroidal coil using cubic meshing", Progress in Electromagnetics Research Symposium, Xian, China, March 2010.

15 M. R. alizadeh Pahlavani, **A. Shiri**, H. A. Mohammadpour and A. Shoulaie, "Magnetic flux density analysis of helical toroidal coil using finite element approach", Progress in Electromagnetics Research Symposium, Xian, China, March 2010.

16 **A. Shiri**, M. R. alizadeh Pahlavani, H. A. Mohammadpour and A. Shoulaie, "Electromagnetic force distribution on cylindrical coils' body", Progress in Electromagnetics Research Symposium, Xian, China, March 2010.

17 **A. Shiri** and A. Shoulaie, "Magnetic Force Calculation between spiral coils using mesh-matrix method", 24th Int. International Power System Conf, Tehran, Iran, October 2009(in Persian).

18 **A. Shiri** and A. Shoulaie, "Magnetic Bearing Robust Control Using Fuzzy Logic", 2nd Iranian Power Plants Conference, Tehran, February 2009(in Persian).

19 D. Esmaeil Moghadam, **A. Shiri** and A. Khanyabi, "Calculation and Plot of Capability Curves Based on Synchronous Generator Operating Conditions", 2nd Iranian Power Plants Conference, Tehran, February 2009(in Persian).

20 H. A. Mohammadpour, **A. Shiri**, R. Ghandehari and A. Naghashpour, "Power quality issues in multi – module gate-controlled series capacitor (MGCSC) considering SSR phenomenon", IEEE International Conference on Electric Power and Energy Conversion Systems, Sharjah, UAE, November 2009.

21 H. A. Mohammadpour, M. R. alizadeh Pahlavani, **A. Shiri**, and A. Shoulaie, "Voltage sag mitigation by means of gate-controlled series capacitor (GCSC)", IEEE International Conference on Electric Power and Energy Conversion Systems, Sharjah, UAE, November 2009.

22 **A. Shiri** and A. Shoulaie, "New Results in Calculation of the Magnetic Force between Cylindrical coils using mesh-matrix method", 24th Int. International Power System Conf, Tehran, Iran, November 2008(in Persian).

23 **A. Shiri** and S. Jadid, "Independent Load-Frequency Control in Deregulated Power Systems", 24th Int. International Power System Conf, Tehran, Iran, October 2007(in Persian).

24 S. E. Razavi, M. R. Jahedmotlagh, **A. Shiri**, and H. Amin Elahi, "Near optimum control of large scale systems: Synchronous turbo generator system as a case study", The 42nd International University's Power Engineering Conference, University of Brighton, Brighton, UK, September 2007.

25 H. Nasir Aghdam, A. Jalilian and **A. Shiri**, "Voltage Sag Mitigation in Power Systems Using Series Static Compensator Employing PQR Algorithm", 15th Iranian Electrical Engineering Conference, Tehran, Iran, May 2007(in Persian).

26 **A. Shiri**, A. Vahedi and A. Shoulaie, "The effect of parameter variations on the performance of indirect vector controlled induction motor drive", IEEE International Conference on Industrial Electronics, Vol. 3, July 2006.

Education:

- ✓ **Ph.D. in Electrical Engineering**
  Iran University of Science & Technology, Tehran, Iran **2006- 2012**
  Thesis Title: "Design and Optimization of Linear Induction Motor, Considering End Effect "

- ✓ **M. Sc. in Electrical Engineering**
  Iran University of Science & Technology, Tehran, Iran **2004- 2006**
  Dissertation Title: "Calculation of Magnetic Forces between Current Carrying Coils"

- ✓ **B. Sc. in Electrical Engineering**
  Tabriz University, Tabriz, Iran **2000- 2004**
  Thesis Title: "Investigation of DC/DC Converter Topologies and their Soft Switching Possibilities"

Teaching Experiences:

University:

M. Sc./PhD. courses:

- ✓ Linear Electric Motors (at Shahid Rajaee University and Azad University)
- ✓ Design of Linear Electric Motors (at Shahid Rajaee University)
- ✓ Generalized Theory of Electrical Machines (at Azad University)
- ✓ Control of Electric Drives (at Azad University)
- ✓ Advanced High Voltage and Electrical Insulation Engineering (at Shahid Rajaee University and Azad University)

B. Sc. courses:

- ✓ Electrical Measurement (at Sahand University of Technology and Azad University)
- ✓ Industrial Electronics (at Azad University)
- ✓ Electric Circuits I and II (at Shahid Rajaee University and Azad University)
- ✓ Electrical Machines I, II and III (at Shahid Rajaee University and Azad University)
- ✓ Electrical Machines Lab. I and II (at Shahid Rajaee University and Azad University)
- ✓ Special Electrical Machines (at Shahid Rajaee University and Azad University)
- ✓ High Voltage and Electrical Insulation Engineering (at Shahid Rajaee University and Azad University)
- ✓ Industrial Electronics Lab. (at Azad University)
- ✓ Fundamentals of Electrical Engineering I and II (at Iran University of Science and Technology)

Short Period Courses in Industries:

- ✓ Electric motor Winding in Parsian Gas Refining Company
- ✓ Variable Frequency Drives at Ilam Gas Refining Company
- ✓ Electric motor Winding in Sarchemeh Copper Mining Company
- ✓ Emergency Generators at Parsian Gas Refining Company
- ✓ USB and Battery Chargers at Asalooye Gas refining Company

Work and Research Experiences:

Organizing Chair of 11th Power Electronics, Drive Systems and Technologies Conference: https://pedstc2020.sru.ac.ir/en/org_chart.php

Researcher:

- ✓ Tabriz Regional Electric Company, 2004.
- ✓ Niroo Research Institute, 2008-2009.

Research Assistant:

- ✓ Research Assistant of Prof. Abbas Shoulaie at Power Electronics and Magnetic Systems Research Lab., 2005- 2013.

Research grants:

- ✓ "Design and modeling of linear motors and generators in industrial and domestic applications", 2024.
- ✓ "Application of linear motors and generators in rail and road transportation systems", contract number: 4974, 2023.
- ✓ "Design optimization of tubular linear induction launchers", contract number: 3564, 2022.
- ✓ "Design and construction of single-phase linear induction motor for home applications", contract number: 20545, 2021.
- ✓ "Design and construction of rotating secondary for testing different linear induction motors in steady-state conditions", contract number: 28144, 2020.
- ✓ "Design and construction of ladder-secondary linear induction motor", contract number: 2274, 2018.
- ✓ "Design and construction of single-sided linear induction motor", contract number: 33686, 2017.

I have also worked on the following projects:

- ✓ Design and Construction of Single-sided Linear Induction Motor at Iran University of Science and Technology and Azad University
- ✓ Electromagnetic and Thermal Simulation of Power Plant Synchronous Generator by Finite Element Method at Niroo research Institute, 2016
- ✓ Design and construction of 63 kV class hollow composite insulator at Niroo research Institute, 2019
- ✓ Investigation and Simulation of Multi-Level Inverters for Electric Motor Drives
- ✓ Design and Simulation of Voltage Inverters
- ✓ Control of Magnetic Levitation Systems
- ✓ Control of Magnetic Bearings
- ✓ Investigation and Design of Marx Generators
- ✓ Design of linear generators for hybrid vehicles and wave energy conversion