

# Farshad Sayadi



Website: [farshadsayadi.com](http://farshadsayadi.com)  
Email: [ph.sayadi@gmail.com](mailto:ph.sayadi@gmail.com)  
Phone: +98 (935) 721 7001

## Education

**M.Sc. in Power Electronics and Electric Machines**, Sep.2018- Feb.2023

Shahrood University of Technology, Shahrood, Semnan, Iran

Thesis Topic: Dynamic Transient Modeling of an Axial Flux Hysteresis-Reluctance Machine

Supervisor: Prof. Ahmad Darabi

GPA: 3.19/4.0 (Ranked 3 in the field of study)

Received full tuition waiver scholarship

**B.Sc. in Power Engineering**, Sep.2014-Aug.2018

Shahrood University of Technology, Shahrood, Semnan, Iran

GPA: 3.28/4.0 (Ranked as the 10th among more than 120 students at the end of the bachelor's)

Received full tuition waiver scholarship

## Research Interests

- Electric Machines
- Designing/ Modeling/ Manufacturing
- Electromagnetic Devices
- Electric Power Systems
- Electromechanics
- Renewable Energy

## Academic Projects

**Fabrication of the designed Hysteresis-Reluctance**, Mar.2023-Present

- Manufactured all parts of the designed motor
- Assembled and primary tests are done
- Experimental tests in progress

**Design and fabrication of measuring instrument**, Sep.2023-Present

- Will be used for the designed Hysteresis-Reluctance Motor
- Arduino Mega 2560 as processor
- Three-phase voltage, current, and power meter
- Speed meter with opto-counter
- Main OC Protection with Mega 2560 processor and Backup OC protection with MCB

**Circumferential Hysteresis-Reluctance with Slotless-Stator Design Algorithm**, Aug. 2020- Nov. 2020

- Combined design algorithm of Reluctance Motor and Hysteresis Motor (Based on Elliptical Approximation)
- Implemented with several repetitive processes in MATLAB
- Applied Direct Search Optimization Method

**Simple Salient Pole Circumferential Reluctance with Slotless-Stator Design Algorithm**, Jun.2020-Aug.2020

- Obtained the reactance of d-axis and q-axis
- Investigated the design algorithm
- Approved by JMAG-Designer

**Hysteresis Phenomenon**, Jan.2020-Jun.202

- Applied 2D Scalar Preisach Method
- Implemented the modeling in MATLAB

**Simulating Step-Up Five-Level Inverter**, Sep.2019-Jan.2020 (Power Electronics Converters Design course)

- The simulation includes a boost converter, SDC cell, HB, and LC filter in MATLAB/ Simulink
- Compared with existing topologies of single-phase inverters

**Inertia in the power grid**, Dec.2019 (Power System Dynamics I course)

Investigated inertia and its effect on the power grids and micro-grids

**Radial-Flux Induction Motor**, Feb.2019-Jun.2019 (Electric Machines Design course)

- Designed and optimized in MATLAB
- Verified with 2D modeling in JMAG-Designer

**Controller for Doubly Fed Induction Generator**, May 2019 (Control of Electric Drives course)

- Simulated the paper “Shen, B., Mwinyiwiwa, B., Zhang, Y., & Ooi, B. T. (2009). Sensorless maximum power point tracking of wind by DFIG using rotor position phase lock loop (PLL). *IEEE Transactions on Power Electronics*, 24(4), 942-951.”
- Implemented in MATLAB/ Simulink

**Three-phase Cyclo-Converter**, Sep.2018-Jan.2019 (Power Electronics I course)

- Designed a 3-phase 380V 50Hz to 3-phase 100V 10Hz converter
- Modeled in MATLAB/ Simulink

**Dynamic Modeling of Electric Machines based on “Krause, P. C., Wasynczuk, O., Sudhoff, S. D., & Pekarek, S. (2002). *Analysis of electric machinery and drive systems* (Vol. 2). New York: IEEE Press.”**,

Sep.2018-Dec.2018 (Comprehensive Theory of Electric Machines course)

- Salient-Pole Synchronous Machines in abc and dqo coordinate
- Induction Machines in abc and dqo frame
- Modeled in MATLAB/ Simulink
- Approved by JMAG-Designer

**Circumferential Hysteresis-Reluctance Motor with various thicknesses of Reluctance yoke**,

Sep.2017-Jun.2018 (B.Sc. final project supervised by Prof. Ahmad Darabi)

- Manufactured several Reluctance discs with different pole thicknesses
- Performed experimental analysis
- Utilized JMAG-Designer for 2D and 3D FEM simulations of Reluctance discs

**Lighting calculation**, Mar. 2017- May 2017

- Implemented based on the Lumen Method in MATLAB
- Validated by DIALux software

### **Publications**

F. Sayadi, A. Darabi, A Novel Dynamic Modeling of Circumferential Hysteresis Motors with Slotless-Rotor (in preparation)

F. Sayadi, A. Darabi, Design Algorithm of Circumferential Hysteresis-Reluctance Motors with Slotless-Rotor (in preparation)

A. Pirnia, A. Darabi, and F. Sayadi, A detailed design algorithm for TORUS-Slotted Axial-Flux Permanent-Magnet Motor and simulation with FEM; *13th Power Electronics & Drives: Systems and Technologies Conference PEDSTC 2022*.

### **Laboratory Experience**

**Electric Machines Laboratory**, Faculty of Engineering, Ferdowsi University of Mashhad, Mashhad, Khorasan-Razavi, Iran, Sep.2023-Present

Role: Researcher

*Performing the experimental test of the prototype Circumferential Hysteresis-Reluctance Motor*

**SAS Laboratory**, Peyman Khotoot Shargh Company, Mashhad, Khorasan-Razavi, Iran, Nov.2020-Present

Role: Supervisor (since Sep.2022)

- *Connected ABB RTU560 and SIEMENS Telegyr Systems*
- *Investigated compatibility of ABB RTU560 and GE Relays via IEC61850*
- *Performed logics of Busbar Coloring feature in ABB RTU HMI with KW Multiprog*

**Electric Machines Laboratory**, Faculty of Electrical Engineering, Shahrood University of Technology, Shahrood, Semnan, Iran, Sep.2017-Jan.2023

Role: Research Assistant

- *Modeled dual-rotor axial flux induction motor in JMAG-Designer*
- *Modeled Permanent-Magnet Synchronous Motor in JMAG-Designer*
- *Performed an experimental test of Transverse Flux Permanent-Magnet Generator*
- *Investigated the effect of changing yoke thickness in Circumferential Hysteresis-Reluctance Motor*

**Power System Laboratory**, Faculty of Electrical Engineering, Shahrood University of Technology, Shahrood, Semnan, Iran, Mar.2018-May 2018

Role: Researcher

*Simulated IEEE 30-Bus System by DIgSILENT*

## **Work Experience**

**Senior Engineer**, Sep.2020-Present

Engineering Department, Peyman Khotoot Shargh Company, Mashhad, Khorasan-Razavi, Iran

Head of Engineering Dep. (number of members: 10), Supervisor of SAS Lab. (number of members: 4), and Trainer. Directly involved as a principal in the more than 20 projects briefly discussed below.

- *Shahid Kaveh Ghaen Combined-Cycle Power Plant 1GW, South-Khorasan, Iran, Mar.2023-Mar.2024 (expected)*
- *Shirvan Combine-Cycle Power Plant 1.5GW, North Khorasan, Iran, Mar.2023-Sep.2024 (expected)*
- *Haram Razavi 132/20kV, Mashhad, Iran, Mar.2023- Sep.2024 (expected)*
- *Rivash 132/20kV Substation, Khorasan-Razavi, Iran, Mar.2021-Sep.2023*
- *Ardakan Float Glass Co., Yazd, Iran, Mar.2022-Mar.2023*
- *Esfandagheh Solar Power Plant 10MW, Kerman, Iran, Sep.2021-Jan.2023*
- *Saravan 230/63/20kV Substation, Sistan & Baluchestan, Iran, Jun.2022-Feb.2023*
- *Water Transfer from the Persian Gulf (six 132/20kV Substations), Hormozgan, Iran, Sep.2020-Jul.2021*
- *Almahdi Aluminum Co., Bandar Abbas, Hormozgan, Iran, Jun.2021-Dec.2021*
- *SCADA in Hafez 132/20kV (Mashhad, Iran), South-West 230/132/20kV (Ahvaz, Iran), Mazrae Kalantar 132/20kV (Yazd, Iran), Doosti Dam 132/20kV (Pumping Station No. 4, Mashhad, Iran) substations, etc., Sep.2020-Mar.2022*

**Commissioning Engineer (Internship)**, Jul.2018-Sep.2018

Engineering Department, United Energy Developer Company, Tehran, Iran

Commissioning in West Mazandaran Single-Shaft Combine-Cycle Power Plant 500MW, Worked on the generator and main transformer protection and electrical tests (such as short circuit curve, excitation system, etc.)

**Sales and technical expert**, Sep.2016- Mar.2017

Electrosanat Pars Company, Shahrood, Semnan, Iran

Designed and installed MV and LV panels for factories and railway

## **Teaching Experience**

**Training Course Teacher**, Nov.2020-Present

Peyman Khotoot Shargh Company, Mashhad, Khorasan-Razavi, Iran

- Course: SCADA and DCS including ABB devices (RTU560, RTU520, MicroSCADA, RTU HMI, KW Multiprog, etc.), GE Relays (UR, F650, etc.), SIEMENS Telegyr System, Industrial

Communicating Protocols (IEC60870-5-101/ 103/ 104, IEC61850, Modbus, DNP3.0, LONWORKS), and LV interface panels

- Conducted advanced courses with over 90 trainees, including engineers from Khorasan Regional Electric Company, Khuzestan Regional Electric Company, Almahdi Aluminum Co, Arakan Float Glass Co., etc.
- Practical lessons delivered in a simulated real-world laboratory environment
- Certified trainees' performance for practical application

**Extra Curriculum Teacher, Feb.2016-Feb.2022**

Shahrood University of Technology, Shahrood, Semnan, Iran

- Course: Electric Machines 1, Electric Machines 2, Electric Machines 3
- Held weekly individual sessions addressing student questions, totaling over 930 hours and 200 students
- Planned and reviewed lessons, managed classroom, administered exams, assessed students, and provided feedback and guidance
- Recognized as the best Teaching Assistant by the Faculty of Electrical Engineering for multiple consecutive years

## **Skills**

### **Electric Machines Modeling**

### **Electric Machines Design**

**Electromagnetic Analysis Tools-** JMAG-Designer, COMSOL Multiphysics

**SCADA and DCS/ Protocols-** ABB MicroSCADA, ABB RTU500 Series, KW Multiprog, ABB RTU HMI Editor, ABB PCM600, Triangle Microworks Protocol Test Harness, Modbus Poll, GE EnerVista, SIEMENS Telegyr 800 Series, IEC60870-5-101/103/104, IEC61850 MMS, LONWORKS, Modbus, DNP3.0.

**Network/ Serial Communication Link-** Network manager, Electrical Switches (CISCO, D-Link, Moxa, etc.), Router (CISCO, Mikrotik), Antenna (Mikrotik), RDP, RS232, and RS485.

**Software/ Scripting-** MATLAB, SOLIDWORKS, AutoCAD, AMpro (Webko Relays and Tester), DIgSILENT, Proteus Design Suite, Microsoft Office, Adobe Photoshop, C.

**Controller Programming (SIEMENS S7-1200, S7-300, and Logo!)-** TIA Portal, Simatic Manager

**English-** IELTS (Will be taken on Dec. 2023)

## **References**

**Dr. Ahmad Darabi** (Professor)

Faculty of Electrical Engineering, Shahrood University of Technology, Shahrood, Semnan, Iran

Email: [darabi@shahroodut.ac.ir](mailto:darabi@shahroodut.ac.ir)

**Dr. Amir Hasannia** (Assistant Professor)

Faculty of Electrical Engineering, Shahrood University of Technology, Shahrood, Semnan, Iran

Email: [amir.hassannia@shahroodut.ac.ir](mailto:amir.hassannia@shahroodut.ac.ir)

**Dr. Mahdi Banejad** (Associate Professor)

Faculty of Electrical Engineering, Shahrood University of Technology, Shahrood, Semnan, Iran

Email: [m.banejad@Shahroodut.ac.ir](mailto:m.banejad@Shahroodut.ac.ir)