



**Seyed-Mehdi Rakhtala**  
**Assistant Prof.**

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Location: Gorgan –Iran

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## Research Interests

### Current subjects:

#### My research interests are on:

Robotic control, Mechatronic systems, Wearable/ Rehabilitation robots, Soft robotic, Precision control for 3D Printers, Nonlinear control and observer, Industrial automation systems (PLCs- Monitoring), Hybrid vehicle and energy management.

### Education

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➤ **PhD in Electrical Engineering/ automatic control and robotic**, University of Mazandaran (UMZ)

[Jan.2008–Jun.2013], Grade achieved: [A]

**Title:** Finite-time convergence of nonlinear observer to control of nonlinear systems with delay, application in PEM Fuel Cell.

**Supervisors:** Dr. A. Ranjbar Noei - R. Ghaderi and Elio Usai.

**Description:** In this thesis, designing of a finite-time High-Order Sliding Mode (HOSM) observer developed to be used in a sensor-less control. The observer design technique is proposed to estimate some key states in a Multi-Input Multi-Output (MIMO) proton exchange membrane fuel cell (PEMFC). The observer reconstructs oxygen excess ratio using measurable variables, such as the compressor angular speed, the supply, the return manifold pressures and the load current. The designed finite-time observer is shown with some increases in the response time indices, improves the accuracy whilst guarantees a fast convergence.

**Studentship:** Funded by SANA Ltd (Renewable energy organization of Iran).

**Sabbatical Leave:** Automatic Lab- Cagliari University of Italy [September/2011- March/2012].

### Professional Experience about 20 years:

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❑ [Jan 2014 – June 2019 (over 4 years)] [Dean of Electrical and Electronic Department] [Golestan University-Gorgan-Iran].

❑ 2013-08-24 -Now (eight years)] [Assistant Professor] [Golestan University-Gorgan-Iran].

- ❑ 2004– 2010 [Head of group /Senior Engineer] [Fuel cell Research center- Babol (Noshirvani) University of Technology].
- ❑ [1998– 2004 (over 6 years)] [Senior Electronic Engineer-Tehran-Iran].

## Teaching Experiences

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### ❖ Assistant Prof., Golestan University, August 2013 – present

#### Teaching responsibilities:

- **Master of Science Modules:** Mechatronic I, Mechatronic II (Python and Raspberry Pi), Sensors for robots, Advanced Industrial automation, Advanced control.
- **Bachelor students of Modules:** Automatic control, Programmable Logic controller (PLC), Digital control, Modern control, sensors and Instrumentation, Industrial control, PLC laboratory, Linear control laboratory, Power electronic laboratory.

### ❖ Guest lecturer at Babol (Noshirvani) University of Technology, Iran, 2006- 2012.

**Bachelor students of Modules:** classic control, Programmable Logic controller (PLC), Electrical Measurement

### ❖ Guest Lecturer at Azad University of Aliabad Katool Branch, Golestan, Iran, 2013- 2014

**Master of Science Modules:** Fuzzy control, Nonlinear control

### ❖ Guest Lecturer at Shomal Institute of Education, Amol, Iran, 2008- 2009

**Bachelor students of Modules:** Power Electronic, Linear Control, PLC

## Leadership Experiences

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### Academic Position

- ❖ **Dean of Electrical and Electronic Department- Golestan University-Gorgan-Iran, Jan 2014- June 2019.**
- ❖ **Supervisor of the Scientific Association of Electrical Engineering: Bachelor students of Electrical engineering at Golestan university- Gorgan- Iran, 2013- 2017.**
- ❖ **Supervisor of Robotic Group at Golestan University, since 2017.**
- ❖ **Supervisor of automatic control Lab, since 2014.**

### Industrial Position

- 1- **Leadership of Control and Electronic Group in Fuel Cell Research Center** in Babol (Noshirvani) University of Technology, 2004- 2008.
- 2- **Leadership of Research group: Unmanned Aircraft Systems for following project:** Design and implementation of Unmanned Aircraft Systems for special aim in electrical industries as a washing robot and inspector robot in a hot line system, 2017.

## Research Experience

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- ❖ **Creating and Establishing a mechatronic and robotic control group at Golestan University**

**Subjects:** Wearable robots as knee joints orthosis- Arm exoskeleton, Soft robotics gloves and soft actuators for rehabilitation- Seven MSc students are working on mechatronic and robotic subjects.

❖ **Research Projects and Funds in Robotic and Mechatronic Group**

**Patent and Innovation Awards**

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- 1- **Top Teaching fellow** at Golestan University- Iran- 2018.
- 2- **Patent:** Design and implement of a full-scale microcontroller based DMFC test station (with certificate).
- 3- Design and implement a Power system for Direct Methanol Fuel cell by PLC S7 Siemens (**with award certificate**).
- 4- Design and implementation of programmable control unit for AC/DC Rectifiers (**with award certificate**).
- 5- **First selected PhD students** from total of 60 students for obtaining educational grant by the government in UMZ (During the PhD period).

**Proposals and Funds**

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- 1- Design and manufacturing of Video Laryngoscope- Joint project of Golestan University and Gorgan University of Medical Sciences; Funded by: Golestan Science park, 2020.

❖ **Energy management of Hybrid Electric Vehicles based on advanced control**

**Projects:**

- 2- Design of Zero Energy system based on low speed wind/ PV/Battery – Golestan Province Electricity Distribution Company- Gorgan- Iran, 2018- 2020.
- 3- Control and simulation of Hybrid Fuel cell /Battery/Super capacitors in Distributed Generation (DG), Project with IPDC (Iran Power Development Co)- Tehran-, 2012.

- ❖ **Fuel cell project- Fuel cell Research center-** Babol (Noshirvani) University of Technology- 2004-2010.

**Project 1: This research project was supported by Ministry of science Iran as a national project: “Design and implementation of direct methanol fuel cell with 1.5 Kw” 2008-2012.**

- 1- Microcontroller AVR ATmega128 which includes 16 Digital inputs, 16 Digital outputs, 32 Analog inputs (data collecting for temperature & pressure), 6 PWM outputs for control 4 heater & humidifier and variable speed pump, 5 Interfacing serial port (RS232) with micro-controller for Data acquisition and control of 2 mass flow controllers & 2 mass flow meters.
- 2- Design and implementation of PWM based for heater control of the test station system
- 3- Design and implementation of PWM based for dosing PUMP board for test station system
- 4- Design and implementation of temperature measurement board for test station system
- 5- Design and implementation of pressure measurement board with 4 input for test station system.

## **Project 2: Design and implement a Power system for Direct Methanol Fuel cell by PLC S7 Siemens.**

- 1- Control system design and fabrication of fuel cell power system based on PLC S7 Siemens for fuel cell power system
- 2- Design and fabrication of fuel close loop control with PID controller of PLC for fuel cell power system
- 3- Close loop control of an oxygen feeding system with PID controller in PLC for fuel cell power system
- 4- Design and fabrication of temperature close loop control system with PID controller in PLC for fuel cell power system.

### **Practical and Industrial projects:**

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- 1- **[2019]** RDAQ (Remote Data Acquisition Card) Board Design and fabrication for sending data based on **APN tunnel/ 3G/GPRS** for Dispatching system-Iran-

#### **PLC based projects:**

Professional Career for 15 years: Industrial Automation (PLCs) - PROFIBUS system and SCADA and Telemetry, Industrial Automation (PLCs) – Monitoring with HMI and WINCC.

- 2- **[2018]** PLC Based control and HMI Monitoring of two Hydraulic press with variable torque and variable speed, Iran
  - HMI page designing to key parameters motor monitoring for two hydraulic press plant
  - LS PLC programming to control of hydraulic press plant based on Modbus protocol
  - LS Inverter setting based on RS485-Modbus protocol
  - Hardware wiring of Sensors-PLC-HMI- Connection PLC and HMI based on Rs232 Network
- 3- **[2014]** Control of Inverters of paper production company a Privet company (This project included: 12 Inverters of 0.75KW-1.5 KW-2.5KW-5KW-7.5 KW-10 KW-22KW) with HMI LS company with Modbus protocol - Iran.
  - HMI page designing to key parameters motor monitoring for 12 LS Inverter in paper Factory
  - LS PLC programming to control and synchronizing motors with Reference frequency- Program is written about 1000 lines.
  - LS Inverter setting based on RS485-Modbus protocol
  - Hardware wiring of Inverters- PLC based on RS485 physical layer
  - Design and implementation a Power system for Direct Methanol Fuel cell by PLC S7 Siemens - Fuel cell Research centre- Babol (Noshirvani) University of Technology,
  - Fuel close loop control **with PID in PLC Siemens**
  - Temperature control loop **with PID in PLC Siemens**
  - Oxygen feeding system **with PID in PLC Siemens**

- Temperature control loop **with Fuzzy control in PLC Siemens**
- PWM to Dosing Pump control
- PWM to Heater control
- Analog sensor Measuring (temperature-Pressure-methanol concentration, Tank Level, etc.)
- Analog Output command for Air compressor.
- 4- [2011] Design and implementation of PLC S7-Siemens Education system
- 5- [2009] Design and implementation of waste collection system with cylinders control with Mini PLC LOGO Siemens-Iran.
- 6- [2007] Diesel Generator Control of MWM; 250 KVA with Mini PLC Siemens LOGO OBA5 - Sari-Iran.

#### **Micro-controller and LabVIEW based projects:**

- 7- [2018] Temperature data Logger design-Iran: 4 Chanel Data logger that save data on SD RAM with Excel format, Iran.
- 8- [2018] One Chanel pressure to calculate of Height Water (H) based on eq.  $P = \rho \cdot g \cdot h$ ; that save data on SD RAM with Excel format
- 9- [2017] Design and fabrication of 32 channel Pressure Data logger based on LabVIEW software- Gorgan University of agriculture science and nature resource-Iran.
- 10- [2008-2012] Supported by Ministry of science Iran as a national project: Design and implementation of direct methanol fuel cell with 1.5 Kw at Fuel Cell Research Technology Group in Babol University of Technology.”

#### **Detailed achievements:**

- Design and Fabrication a real time of 1.5 kW test station system of Direct Methanol Fuel Cell Stack system.
- Microcontroller AVR, ATmega128 which includes 16 Digital inputs, 16 Digital outputs, 32 Analog inputs (data collecting for temperature & pressure).
- 6 PWM outputs for control 4 heater & humidifier and variable speed pump,
- 5 Interfacing serial port (RS232) with micro-controller for Data acquisition and control of 2 mass flow controllers & 2 mass flow meters.
- Design and implementation of temperature measurement board for test station system
- Design and implementation of pressure measurement board with 4 input for test station system.

#### **DAQ and LabVIEW based projects:**

- 11- [2011] Control and Monitoring for Loading Arm of Liquid Gas & 32 Zone Flame Detector & Trucks Loading System and control of Deluge Valves for National Oil Company with LabVIEW software and Modbus protocol and Advantech card USB4711A. April 2011
- 12- [2007] Temperature monitoring (16 channel inputs) by Data-Acquisition Card -Advantech USB 4711A with LabVIEW software monitoring.

13- [2011] Oil Company Project (not completed); Installation of encoder Eltomatic instead of Gear to flow measurement VEGA monitoring on PC with Wireless modem.

### **Others:**

14- [2014] Permanent and Maintenance of Telemetry – SCADA and Telemetry system of Gorgan water and wastewater Company with 29 node-Water and Sewage Company of Golestan province- Gorgan- Iran.

15- [2011] Supervisor a project: Design and implementation of direct methanol of fuel cell 1.5 Kw- Iran.

16- [2012] Project advisor for Intelligent management of diesel engines (ECU design)- Iran

17- [2006] Design and implementation of a programmable control unit for AC/DC Rectifiers-Tehran.

18- [2006] Design and implementation of a control valve 20 channels (20 output Triac), based on Micro-controller 89C5X consist of LCD & Design with Protel- Tehran, Iran.

19- Design and implementation of a Digital VCO (Voltage Control Oscillator) Set with Micro-controller 89C5X & Design with Protel - Tehran, Iran.

## **Software and Programming Skills**

### **Languages and Programming:**

**Python in Raspberry Pi-** C scripting for Microcontrollers with certificate: 89C51-89C5x.

LabView- MATLAB (SIMULINK/m-File)- Real time in MATLAB- HWIL (Hardware in the loop) with Data acquisition Card (DAQ)

PLC Programming: PLC Siemens STEP 7- TIA software for Siemens PLCs - LS Korea- FESTO, WINCC (PC Monitoring) and WINCC Flexible (HMI Monitoring)- HMI (LS-Siemens)- ProFi-Net, ProFi-Bus, Industrial network- Mini PLC (Logo, Zen Omron).

### **Others:**

Proficient with Genetic Algorithm, Artificial Neural Network

PCB and Schematic Design of Electronic board: PROTEL- Altium Designer

### **General:**

Power Point, Word, Excel, Access.

### **Certificates**

- 1- PLC Festo Didactic (since 2001).
- 2- Advanced Programming of Festo PLCs (since 2001).
- 3- Microcontroller based on C scripting from Dena Soft

### **Language**

PERSIAN (NATIVE), ENGLISH, ITALIAN(BASIC)

### **Publications**

**BOOK**

[B1] Control of induction motor, Industrial Inverter DELTA, **S. M. Rakhtala**, Ahmad Esfand mod, Morteza Ardeshiri, ISBN: 987-964-8424-60-7-2009, (In Farsi).

## JOURNAL PUBLICATIONS

[J1] **S. M. Rakhtala**, Alessandro Casavola, Real Time Voltage Control based on Second Order Siding Mode Cascade Structure for DC-DC Converter; **IEEE Transactions on Industrial Electronic**, June, 2021, Impact factor 7.515.

[J2] **S. M. Rakhtala**, M. Yasoubi, H. HosseinNia, Design of Second Order Sliding Mode and Sliding Mode Algorithms: A Practical Insight to DC-DC Buck Converter, **IEEE/CAA Journal of Automatic Sinica**, (2017), Vol. 4(3), pp. 487. ((ISI- Thomson-IF: 6.17-Q1).

[J3] M. Behshti, **M Rakhtala**, E. shafiee Roudbari, Voltage and frequency regulation in islanded microgrid with PEM fuel cell based on a fuzzy logic voltage control and adaptive droop control, **IET Power Electronics**, (January 2020), Vol.13(1), pp. 78-85: (ISI- Thomson-IF: 2.839)

[J4] **S. M. Rakhtala**, E. Shafiee Roudbari, Fuzzy PID control of a stand-alone system based on PEM fuel cell. **International Journal of Electrical Power & Energy Systems**, (2016), Vol. 78, pp.576–590 (ISI- Thomson-IF: 3.610).

[J5] N. Mirrashid, **S. M. Rakhtala**, M. Ghanbari, Modeling and analysis of robust control design for air breathing proton exchange membrane fuel cell system via variable gain second- order sliding mode. John Willey, **Energy Science & Engineering**, (2018), Vol. 6(3), pp.126–18. (ISI- Thomson-IF: 3.553).

[J6] **S. M. Rakhtala**, R. Ghaderi, A. Ranjbar noei, E.Usai, Design of Finite-time High-Order Sliding Mode State Observer; a Practical Insight to PEM Fuel Cell System. **Journal of Process Control**, (2014), Vol. 24(1), pp. 203-224. (ISI- Thomson-IF: 3.624).

[J7] **S. M. Rakhtala**, Adaptive Gain Super Twisting Algorithm to Control a Knee Exoskeleton Disturbed by Unknown Bounds, **Springer, International Journal of Dynamics and Control**, pp.1-16, 29 Sep. 2020.

[J8] Mohamadreza samadi, **Seyed mehdi Rakhtala**, Reducing Cost and Size in Photovoltaic Systems using Three Level Boost Converter based on Fuzzy Logic controller, (2018), **Springer, Iranian Journal of Science and Technology Transaction of Electrical Engineering**, (ISI- Thomson-IF: 0.519).

[J9] **S. M. Rakhtala**, Emran Fazli, Naghmeh Mirrashid, Real-time control design based on super twisting sliding mode algorithm of an upper limb soft wearable; under review on **IEEE Transactions on ....**

[J10] **S. M. Rakhtala**, Roozbeh Ghaiebi, Fabrication of a soft robotic glove and design a closed-loop control by two parallel sensors with MBD approach; under review on **IEEE Transactions on ....**

[J11] **S.M. Rakhtala**, A. Ranjbar Noei, R. Ghaderi, E. Usai, “Control of oxygen excess ratio in PEM fuel cell system using high-order sliding mode controller and observer” **Turkish Journal of Electrical Engineering & Computer Science**, (2015), Vol. 23, pp. 255 – 278. (ISI- Thomson-IF: 0.697).

[J12] **S.M. Rakhtala**, R. Ghaderi, A. Ranjbar “Proton exchange membrane fuel cell voltage-tracking using artificial neural networks”, **Springer, Journal of Zhejiang University Science C or Frontiers of**

Information Technology & Electronic Engineering (formerly known as Journal of Zhejiang University SCIENCE C (Computers & Electronics), (2011), Vol. 12(4), pp. 338-344. (ISI- Thomson-IF: 0.910).

[J13] M. Shakeri, **M.R. Rostami**, and J. Imen, “A full scale microcontroller based DMFC test station” **Transactions of the ASME Journal. Fuel Cell Sci. Technology**, (2008), Vol. 6(1).

Journal of Electrochemical Energy Conversion and Storage (ISSN: 2381-6872), 2016 - present Journal of Fuel Cell Science and Technology. (ISI- Thomson-IF: 1.429).

**M.R. Rostami (Mehdi Rakhtala Rostami)**

[J14] **S.M. Rakhtala**, M. Ahmadi, Twisting control algorithm for the yaw and pitch tracking of a twin rotor UAV, **International Journal of Automation and Control**, (2017), Vol. 11(2), pp.143-163. (Scopus- ISI- Thomson).

[J15] **S. M. Rakhtala**, Self-tuning fuzzy logic PID controller with a practical view to PEM fuel cell, Accepted, *International Journal of Modeling, Identification and Control (IJMIC)*, 14-Apr-2020.

[J16] M Samadi, **S.M Rakhtala**, M Ahmadian, Boost converter topologies, hybrid boost and new topologies of voltage multiplier in photovoltaic systems, *Journal of Solar Energy Research*, (2019), 4 (4), pp. 287-299.

[J17] M Samadi, **M Rakhtala**, Design output control TLB converter for DC drive applications with photovoltaic power supply”, *Journal of Solar Energy Research* , (2017), Vol. 2 (3), pp.105-110.

[J18] **S.M.Rakhtala** , R.Ghaderi, A.Ranjbar, Control of PEM fuel cell system via higher order sliding mode control, **International Journal of Automation and Control**, (2012), Vol. 6( 3/4).

[J19] SMM Moghadam, AR Khosravi, **S. M. R Rostami**, Design of a Robust Sliding Mode Controller Based on Nonlinear Modeling of Variable Speed Wind Turbine. *Majlesi Journal of Electrical Engineering*, (2017), Vol. 11 (4).

[J20] N Mirrashid, **S.M Rakhtala**, Fuel Cell Systems and Developments in Control Abilities, *Medbiotech Journal*, (2019), Vol. 3 (02), pp. 41-46.

[J21] V CHIROIU, **S.M. Rakhtala**, C Brisan, OPTIMIZATION OF A PACKING MANIPULATION ROBOT, *Romanian Journal of Mechanics*, (2019), Vol.4 (1), pp. 39-50.

[J22] **Seyed Mehdi Rakhtala** Abolfazl Ranjbar, Robust Feedback Linearization Control of Air-Feed System in PEM Fuel Cell against Practical Uncertainty, *Istanbul University - Journal of Electrical and Electronics Engineering (IU-JEEE)*, (2016), Vol. 16(1), pp.1981-1994.

[J23] **S. M. Rakhtala**, A. Ranjbar Noei, R. Ghaderi, Systematic Approach to Design a Finite Time Convergent Differentiator in Second Order Sliding Mode Controller, *International Journal of Engineering (IJE)*, *IJE TRANSACTIONS B: Applications*, (November 2013), Vol. 26(11), pp.1357-1368.

[J24] **Seyed Mehdi Rakhtala** and Roja Eini, Nonlinear Modelling of a PEM Fuel Cell System; a Practical Study with Experimental Validation, *International Journal of Mechatronics, Electrical and Computer Technology*, (Jan. 2014), Vol. 4(10), pp. 1272-1296.

[J25] **Seyed Mehdi Rakhtala**, control of hybrid fuel cell and battery system for tracking of performance

in optimal point (in Farsi), (October 2016), Vol.19 – No.3 in Iranian Journal of energy.

[J26] N Mirrashid, **S. M Rakhtala**, Control Techniques for Fuel Cell Systems, Turkish Journal of Engineering and Technology, Vol. 2 (2), 14-19.

[J27] Naghme Mirrashid, **Seyed Mehdi Rakhtala**, Optimizing Output Power and Stoichiometric Tracking Oxygen in PEM Fuel Cell System by Second Order Sliding Mode Controller with Super Twining Algorithm, Research Journal of Engineering & Technology, (2015), Vol.1(3), 40-53.

#### CONFERENCE PUBLICATIONS

- ۱- نغمه میررشید- سیدمهدی رخت اعلا  
بهینه سازی توان خروجی و ردیابی استوکیومتری اکسیژن در سیستم پیل سوختی PEM با استفاده از کنترل مد لغزشی مرتبه اول و دوم؛ هشتمین کنفرانس بین المللی مهندسی برق با محوریت انرژی های نو- سال ۱۳۹۴
- ۲- نغمه میررشید- سیدمهدی رخت اعلا  
بهینه سازی توان خروجی و ردیابی استوکیومتری اکسیژن در سیستم پیل سوختی PEM با طراحی کنترلر فوق پیچشی بهره متغیر؛ هشتمین کنفرانس بین المللی مهندسی برق با محوریت انرژی های نو سال ۱۳۹۴
- ۳- نغمه میررشید- سیدمهدی رخت اعلا  
بهینه سازی توان خروجی و ردیابی استوکیومتری اکسیژن در سیستم پیل سوختی PEM با کنترلر مد لغزشی مرتبه ۲ با الگوریتم فوق پیچشی؛ سومین کنفرانس هیدروژن و پیل سوختی؛ ۲۲-۲۳ اردیبهشت ماه ۱۳۹۴-تهران، سازمان پژوهش های علمی و صنعتی ایران.
- ۴- جمال قاسمی، سید مهدی رخت اعلا، کمیل اسفندیاری کلائی  
طراحی و شبیه سازی کنترلر فازی برای پیل سوختی پلیمری جهت کاربرد خانگی؛ نخستین همایش ملی انرژی ساختمان و شهر- ۱۳۹۴
- ۵- جمال قاسمی، سید مهدی رخت اعلا، کمیل اسفندیاری کلائی  
طراحی و شبیه سازی کنترلر فازی-ژنتیک بهینه شده برای پیل سوختی پلیمری-  
3<sup>rd</sup> national conference and 1<sup>st</sup> international conference on applied research in electrical mechanical and mechatronin.
- 6- S Poorinezhad, **S. M Rakhtala**, Chattering analysis of second order sliding mode algorithms for linear plants with disturbance, 2<sup>nd</sup> international conference Knowledge-Based Engineering and Innovation (KBEI), 2015.
- 7- M.ahmadi, **S. M Rakhtala**, Twisting control algorithm for the yaw and pitch tracking of a twin rotor UAV, 2<sup>nd</sup> international conference Knowledge-Based Engineering and Innovation (KBEI), 2015
- 8- **S. M. Rakhtala**, R. Ghaderi, A.Ranjbar, T.Fadaeian and Ali Nabavi “Current Stabilization in Fuel Cell/Battery Hybrid System Using Fuzzy-Based Controller” IEEE, Electrical Power and Energy, October, 2009 Montreal, Quebec, Canada.
- 9- **S. M. Rakhtala**, A. Gholamian, A.Ashourpouri “Power control of battery /UC and fuel cell in Hybrid system application in D.G” The 8<sup>th</sup> International Energy Conference, 24-25 May 2011/IRIB International conference center, Tehran, Iran.
- 10- T.Fadaiian, **S. M. Rakhtala**, R.Ghaderi, A.Ranjbar and ali nabavi niaki, A Control Strategy For Hybrid Fuel Cell Battery System Optimization” The 23th Int.Conf. Power System, Iran-PSC2008.
- 11- **S. M. Rakhtala**, R. Ghaderi, A.Ranjbar “sliding mode control of DC\_DC Bi-Directional converter for fuel cell” The 1th Int.Conf . Renewable energy, Iran-Birjand, 2009.

- 12- **S. M. Rakhtala**, R. Ghaderi, A.Ranjbar "Prolong the Stack Life of PEM Fuel Cell System via Higher Order Sliding Mode Control" The 2nd International Conference on Control, Instrumentation, and Automation, Shiraz 2011.
- 13- **S. M. Rakhtala**, R. Ghaderi, A.Ranjbar, T.Fadaeian and Ali Nabavi, Senior Member, IEEE, "PEM Fuel Cell Voltage-Tracking using Artificial Neural Network" IEEE Electrical Power and Energy, October, 2009 Montreal, Quebec, Canada.
- 14- Pisano, D. Salimbeni, E. Usai, **S.M. Rakhtala**, A.R. Noei "Observer-based output feedback control of a PEM fuel cell system by high-order sliding mode technique" 2013 European Control Conference (ECC) July 17-19, 2013, Zürich, Switzerland.
- 15- **S. M. Rakhtala**, E. Usai, "State Estimation and Robust Control in Nonlinear Systems: an Application to Fuel cells", 7<sup>th</sup> Workshop on Structural Dynamical Systems: Computational Aspects (SDS2012), Capitolo, Monopoli, Italy, 11-15 June 2012 (invited talk).
- 16- **S. M. Rakhtala**, R. Ghaderi "Model Predictive Control of Proton Exchange Membrane Fuel Cell by Feedback Linearization" NEEC2010 - Int.Conf. Power System, Iran-Najaf abad -NEEC2010.
- 17- **S. M. Rakhtala**, J. Rouhi, J. Imen and M.Shakeri, " Design and fabrication of a control system for a single cell direct methanol fuel cell ".The 21th Int.Conf. Power System, Iran, 13-15 Nov.2006, and pp259.
- 18- **S. M. Rakhtala**, J. Imen, M. Shakeri, K. Sedighi, A.A. Ghoreashi, M. Faleha "Design a single cell direct methanol fuel" The 11th Int.Conf., Eng. Chemical, Tarbiat Modares , Tehran ,Iran , Nov.2006.
- 19- **S. M. Rakhtala**, T.Fadaeian, R.Ghaderi, A.Ranjbar and M.Shakeri "Temperature control system for PEM Fuel cell" Fundamentals and Developments Fuel Cells 2008 Conference -Dec10-12th,2008,Nancy,France.
- 20- **S. M. Rakhtala**, J.Imen, M. Shakeri,"An innovative control system for a 1.5 KW DMFC test bench", Fundamentals and Developments Fuel Cells 2008 Conference -Dec10-12, 2008, Nancy, France.
- 21- **S. M. Rakhtala Rostami**, M. Shakeri and J. Rouhi, "Determination of optimum operating point of a DMFC by computer simulation software" NEEC2008 - Int.Conf. Power System, Iran-Najaf abad - NEEC2008.

۲۲- طاهره فداییان ، سیدمهدی رخت اعلا رستمی- ارائه استراتژی کنترل جهت بهینه سازی عملکرد سیستم هیبرید پیل سوختی/ باتری- بیست و سومین کنفرانس بین المللی برق - سال ۱۳۸۷

### Journal Peer Reviewer

- 1- **IEEE**, IEEE Access Journal-Impact Factor: 1.270.
- 2- **Elsevier**, ISA Transaction, ISSN: 0019-0578, Impact Factor: 2.256.
- 3- **IET**, IET Science, Measurement & Technology.
- 4- **Taylor & Francis**, International Journal of Green Energy.

- 5- **John Willey**, Asian Journal control
- 6- **SAGE Journals**, Transactions of the Institute of Measurement and Control.
- 7- **Springer**, International Journal of Dynamics and Control.
- 8- **Springer**, Nonlinear Dynamics.
- 9- **Springer**, Intelligent Industrial systems.
- 10- **Springer**, Iranian Journal of Science and Technology, Transactions of Electrical Engineering.
- 11- Turkish Journal of electrical engineering & computer science, ISSN 1300-0632.
- 12- Journal of Iranian Association of Electrical and Electronics Engineers
- 13- Computational Intelligence in electrical engineering-university of Isfahan journal systems.
- 14- Tabriz Journal of electrical engineering (TJEE).

### **Thesis Supervision**

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I supervised around 3 PhD thesis, 18 MSc thesis and 40 BSC/BEng thesis.

#### **Current PhD Projects (as co-supervisor)**

1. Hassan Dahmardeh- Induction motor direct torque method control based on sliding mode control- On going.
2. Naghmeh Mirrashid- Variable gain super twisting algorithm design for an upper limb soft wearable exoskeleton- Ongoing.

#### **Previous PhD Projects (as co-supervisor)**

1. Mohammad Ahmadi- Induction motor direct torque method based on Model Predictive Control- Graduated-2020

#### **Current MSc Thesis (as principal supervisor)**

1. Rozbeh Ghayebi- Soft robotics-robotic gloves: soft actuator design for soft robotic glove for combined assistance, On-going.
2. Yeganeh Firuzi- Soft robotics: robotic gloves: Nonlinear control design for Soft robotic glove, On-going.
3. Fatemeh Aghili- Control of arm exoskeleton for rehabilitation with Sliding mode strategies, On-going.

#### **Previous Supervised MSc Thesis (as principal supervisor)**

1. Naghmeh Mirrashid- Adaptive gain super twisting algorithm for control of air breathing of PEM fuel cell – Graduated, 2014.
2. Samar Pourinejad- Chattering analysis of second order sliding mode algorithms for linear plants with disturbance- Graduated, 2014.
3. Mostafa Ahmadi- Twisting control algorithm for the yaw and pitch tracking of a twin rotor UAV- Graduated, 2015.
4. Reza Ghasemi- Variable gain super twisting algorithm control for Exoskeleton of knee joint Orhtsis- Graduated, 2018.
5. Emran Fazli, Design and fabrication and development of an arm exoskeleton for rehabilitation- Graduated, 2019.

6. Mohammad Lotfi- Development of a knee exoskeleton for rehabilitation- Graduated, 2019.
7. Ali Lashgarboloki- PID genetic control of plug-in hybrid vehicle- Graduated, 2019.
8. Javad sahandi- Power management of hybrid system with Battery/ Ultra capacitor/ PV based on fuzzy control system- Graduated, 2018.
9. Mersad Mehri- MPPT tracking based on Fuzzy control type II in Wind Turbine-Graduated, 2020.
10. Reza Pakzad- Design and implementation of differential level measurement technology for oil tanks with ultrasonic sensor- Graduated, 2020.
11. M.Yaghoobian- Design of super twisting observer for estimation of hydrogen and oxygen pressure in PEM fuel cell- Graduated, 2020.
12. Zahra Alinejad- Design of the fuzzy type II controller to control the robot arm with three degrees of freedom axis- Graduated, 2020.
13. Reza Bajan- Maximum power point tracking of solar power plants based on fuzzy logic controller-Graduated, 2020.

#### References

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Reference are available upon request.