Mohsen Rakhshan – CV

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Education

2017- Ph.D., Computational and Cognitive Neuroscience - Dartmouth College, NH, USA

Research title: *Neural mechanism of decision making under value and perceptual uncertainty*

2015-2017 M.Sc., Electrical Engineering (Systems) - The University of Notre Dame, Indiana, USA

Research title: *Noise effects on learning of spiking neural networks*

2013-2015 M.Sc., Electrical Engineering (Control Systems) - Shiraz University of Technology, Shiraz, Iran

Thesis title: *Sum of Squares-Based Quadratic and Nonquadratic Stabilization Conditions for Nonlinear PDE and ODE Systems in the Polynomial Fuzzy Form*

2009-2013 B.Sc., Electrical Engineering - Shiraz University (Pahlavi University), Shiraz, Iran

Project title: *ANFIS Approach for Tracking Control of MEMS Triaxial Gyroscope*

Awards, Distinctions, Memberships and Fellowships

- Reviewer of PLOS Computational Biology
- Reviewer of IEEE Transactions on Neural Networks and Learning Systems
- Reviewer of IEEE transaction on Cybernetics
- Reviewer of Neurocomputing
- Reviewer of IEEE Conference on Decision and Control
- Reviewer of International Journal of Systems Science
- Reviewer of Journal of Dynamic Systems, Measurement, and Control
- Ph.D. Scholarship, Dartmouth College, NH, USA (Working under NSF EPSCoR grant)
- Ph.D. Scholarship, University of Notre Dame, IN, USA
- Ph.D. Scholarship, University of Texas at San Antonio, TX, USA
- Valero Ph.D. Scholarship, University of Texas at San Antonio, TX, USA
- Student member of IEEE
- Member of The New York Academy of Sciences
- Member of American Association for the Advancement of Science
- Member of Society for Neuroscience (SfN)
- Member of Society for Neuroeconomics (SNE)
- 1^{st} rank in MSEE among all the students of the Engineering school with GPA 4/4

Publications

- Journal papers

1. *Separable influences of reward value on visual processing and choice*, Alireza Soltani, **Mohsen Rakhshan**, Robert Schafer, Brittany Burrows, and Tirin Moore, under revision in Journal of Cognitive Neuroscience
2. *Influence of Expected Reward on Temporal Order Judgment*, **Mohsen Rakhshan**, Vivian Lee, Emily Chu, Lauren Harris, Lillian Laiks, Peyman Khorsand, and Alireza Soltani, Journal of Cognitive Neuroscience, 2020
3. *Contributions of Anterior Cingulate Cortex and Basolateral Amygdala to Decision Confidence and Learning Under Uncertainty*, **Mohsen Rakhshan**, Alexandra Stolyarova, Evan Hart, Thomas O'Dell, Megan Peters, Hakwan Lau, Alireza Soltani, and Alicia Izquierdo, Nature Communications, 2019
4. *Robotic Manipulator Control Based on an Optimal Fractional-order Fuzzy PID Approach: SiL Real-time Simulation*, Reza Ardeshiri, Mohammad Khooban, Amin Noshadi, Navid Vafamand, and **Mohsen Rakhshan**, Soft Computing, 2019
5. *On Passivity of Fractional Order Systems*, **Mohsen Rakhshan**, Vijay Gupta, and Bill Goodwine, SIAM Journal on Control and Optimization, 2019
6. *Distributed Saturated Control for a Class of Semilinear PDE Systems: An SOS Approach*, Jose Luis Pitarch, **Mohsen Rakhshan**, Mohammadmehdi Mardani, and Mokhtar ShaSadeghi, IEEE Transaction on Fuzzy Systems, 2018
7. *Polynomial Control Design for Polynomial Systems: A Non-iterative Sum of Squares Approach*, **Mohsen Rakhshan**, Navid Vafamand, Mohammad Mehdi Mardani, Mohammad-Hassan Khooban, and Tomislav Dragičević, Transactions of the Institute of Measurement and Control, 2018
8. *Maximum Power Point Tracking Control of Photovoltaic Systems: A Polynomial Fuzzy Model-Based Approach*, **Mohsen Rakhshan**, Navid Vafamand, Mohammad Hassan Khooban, and Frede Blaajberg, IEEE Journal of Emerging and Selected Topics in Power Electronics, 2017
9. *Dynamic Model-based Fuzzy Controller for Maximum Power Point Tracking of Photovoltaic Systems: A Linear Matrix Inequality Approach*, Navid Vafamand, **Mohsen Rakhshan**, Journal of Dynamic Systems, Measurement and Control, 2017
10. *Active Noise Control Using Wavelet Function and Network Approach*, **Mohsen Rakhshan**, Ehsan Moula, Shapour Khorshidi, Behrouz Safarinejadian, and Faridoon Shabani-nia, Journal of Low Frequency Noise, Vibration and Active Control, Vol. 35 (1), pp. 4-16, 2016
11. *Design of Networked Polynomial Control Systems with Random Delays: Sum of Squares Approach*, **Mohsen Rakhshan**, Navid Vafamand, Mokhtar ShaSadeghi, Morteza Dabbaghjamanesh, and Amirhossein Moeini, International Journal of Automation and Control, Vol. 10 (1), pp. 73–86, 2016
12. *An Unknown Input Observer for Fault Detection Based on Sliding Mode Observer in Electrical Steering Assist Systems*, Mohammad Amin Tajeddini, Behrouz Safarinejadian, and **Mohsen Rakhshan**, Amirkabir International Journal of Modeling, Identification, Simulation & Control Vol. 47(2), pp. 31-43, 2015
13. *ANFIS Approach for Tracking Control of MEMS Triaxial Gyroscope*, **Mohsen Rakhshan**, Faridoon Shabani-Nia, and Mokhtar ShaSadeghi, Modeling and Simulation in Electrical and Electronics Engineering, Vol. 1 (1), pp. 35-40, 2015
14. *An optimized model of electricity price forecasting in the electricity market based on fuzzy time-series*, Behrooz Safarinejadian, Masihollah Gharibzadeh, and **Mohsen Rakhshan**, Systems Science & Control Engineering: An Open Access Journal, Vol 2 (1), pp. 677-683, 2014
15. *An Automotive Cruise Control Using Fuzzy Control Optimized via Extended Kalman Filter*, **Mohsen Rakhshan**, Hassan Barzegar, Behrouz Safarinejadian, and Fateme Ostovar, Majlesi Journal of Mechatronics Systems, Vol. 3 (4), 2014
16. *Active Noise Control in Presence of Disturbance Using Adaptive Neuro Fuzzy Inference System*, **Mohsen Rakhshan**, Shapour Khorshidi, and Behrouz Safarinejadian, Journal of Computational Intelligence and Electronic Systems, Vol. 3, pp. 1-7, 2014
17. *Relaxed Stabilization Conditions via Sum of Squares Approach for the Nonlinear Polynomial Model*, **Mohsen Rakhshan**, Mohammad Mehdi Mardani, Mokhtar ShaSadeghi, and Mohammad Mardaneh, The Modares Journal of Electrical Engineering Vol. 12 (1), pp. 25-31, 2012

- Peer-reviewed conference papers

    1. *Distributed Nonlinear Control of a Plug-flow Reactor Under Saturation*, Jose Luis Pitarch, **Mohsen Rakhshan**, Mohammadmehdi Mardani, Mokhtar ShaSadeghi, and C. de Prada, 2^{nd} IFAC Workshop on Thermodynamics Foundation of Mathematical Systems Theory, Spain 2016
    2. *An ANFIS-Based Fault Classification Approach in Double-Circuit Transmission Line Using Current Samples*, Mohammad Amin Jarrahi, Haidar Samet, Hossein Raayatpisheh, Ahmad Jafari, and **Mohsen Rakhshan** Advances in Computational Intelligence Lecture Notes in Computer Science Vol. 9095, pp. 225-236, 2015
    3. *Nonlinear Static State Feedback Control Design for Polynomial Systems: A Sum of Squares Approach*, **Mohsen Rakhshan**, Navid Vafamand, and Mokhtar ShaSadeghi, 1st National Conference on Development of Civil Engineering, Architecture,Electricity and Mechanical in Iran, 2014

Research Experiences

- *Value-based decision making and attention (under NSF EPSCoR grant)*, Dartmouth College, 2017- present.
- *Simultaneous decoding of attentional and reward modulations in human EEG (under NSF EPSCoR grant)*, Dartmouth College, 2018- 2019.
- *Noise effects on neural networks*, University of Notre Dame, 2016- 2017.
- *Intelligent Transportation Network Control*, University of Notre Dame, 2015- 2016.
- Sum of Squares-Based Stabilization Conditions for Nonlinear Systems, Shiraz University of Technology, 2013-2015.
- *ROV (Remotely operated underwater vehicle)*, Shiraz University, 2011-2013
- *PCB Rogowski coil for 3 phase high voltage power lines*, Shiraz University, 2012
- *Low frequency sound flow meter*, Shiraz University, 2012
- *Sound Array and object tracking*, Shiraz University, 2011
- *Solar desalination systems prototyping*, Cornell University, 2011

Teaching Experiences

- T.A., Principles of Human Brain Mapping with fMRI, Dartmouth College, Lecturer: Prof. Wager, Winter 2020
- T.A., Laboratory in Psychological Science, Dartmouth College, Lecturer: Prof. Brown, Fall 2019
- T.A., Statistics, Dartmouth College, Lecturer: Prof. Soltani, Spring 2019
- T.A., Laboratory in Psychological Science, Dartmouth College, Lecturer: Prof. Gobbini, Fall 2018
- T.A., Power Systems Analysis and Electrical Machines, University of Notre Dame, Lecturer: Prof. Lemmon, Spring 2016
- T.A., Signal and Systems, University of Notre Dame, Lecturer: Prof. Hochwald, Fall 2015
- Lecturer, Applied Electronics and Digital Circuits, Electrical Engineering, Shiraz University (Students' Research and Entrepreneurship Center), Shiraz, Iran, Fall 2012, Spring 2013
- T.A., Operations Research, Shiraz University, Lecturer: Dr. M. Dehghani, Fall 2013
- T.A., Digital control systems, Shiraz University, Lecturer: Dr. P. KarimAghaei, Fall 2013
- Lecturer: Applied Electronics and Digital Circuits, Electrical Engineering, Payam Noor University (Students' Research and Entrepreneurship Center), Shiraz, Iran, Fall 2012

Working Experiences and Internship

- Co-founder of ARTIN Sanaat Kusha Company, 2014
- Intern, Electrical Engineering section in Shiraz Refinery, Shiraz, Iran, 2013

Community Involvement / Administrative Activity

- Secretary of IEEE student branch in Shiraz University
- Secretary of IEEE student branch in Shiraz University of Technology
- Secretary of IOEEE (Scientific association of Shiraz University, Electrical Engineering department)
- Editorial Board of Azarakhsh professional Magazine (Magazine of Electrical Engineering department of Shiraz university)
- Executive member of the international conference on control and automation 2012, Shiraz University, Iran

Skills

- **Languages**

  English : Full Professional Proficiency
  French : Professional Working Proficiency
  Persian : Native Proficiency
  Arabic, Germany : Elementary Proficiency

- **Programming Languages**

  MATLAB: Professional Proficiency
  Python: Advanced working Proficiency
  R: Intermediate working Proficiency
  C++: Intermediate working Proficiency
  ROS: Elementary working Proficiency

- **Miscellaneous**

  Advanced academic knowledge in: *machine learning and data science*
  Software: *MNE EEG toolbox, Codevision AVR, Altium, Pspice, Proteus, multisim, Labview, Comsol*
  Basic academic knowledge in: *Object Tracking, MEMS and NANO structures*
  Excellent leadership, teamwork and problem solving skills
  Self-motivated and able to multitask, learn quickly and work well under pressure

Interests

- **Running,Hiking**
- **Traveling**
- **Traditional Iranian musical instrument (TAR)**