

Mohsen Rakhshan, Ph.D. candidate

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Education

- 2017 – now **Ph.D., Dartmouth College, NH, USA** in Computational and Cognitive Neuroscience.
Research title: *Interactions of sensorimotor processes in the context of value-based decision making*
- 2015 – 2017 **M.Sc., The University of Notre Dame, IN, USA** in Electrical Engineering (Signals, Systems, and Control).
Research title: *Noise effects on learning of spiking neural networks.*
- 2013 – 2015 **M.Sc., Shiraz University of Technology, Shiraz, Iran** in Electrical Engineering (Control).
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., Shiraz University (Pahlavi University), Shiraz, Iran** in Electrical Engineering (Control)
Research title: *ANFIS Approach for Tracking Control of MEMS Triaxial Gyroscope.*

Research Publications

Journal Articles (* shows equal contribution)



- 1 Soltani, A., **Rakhshan, M.***, Schafer, R.J*, Burrows, B., & Moore, T. (2020). Separable influences of reward value on visual processing and choice. *bioRxiv*.
- 2 **Rakhshan, M.***, Lee, V.* , Chu, E.* , Harris, L., Laiks, L., Khorsand, P., & Soltani, A. (2020). Influence of expected reward on temporal order judgment. *Journal of Cognitive Neuroscience*, 32(4), 674–690.
- 3 Ardeshiri, R. R., Khooban, M. H., Noshadi, A., Vafamand, N., & **Rakhshan, M.** (2019). Robotic manipulator control based on an optimal fractional-order fuzzy pid approach: Sil real-time simulation. *Soft Computing*, 1–12.
- 4 Stolyarova, A.* , **Rakhshan, M.*** , Hart, E., O'Dell, T., Peters, M., Lau, H., Soltani, A., & Izquierdo, A. (2019). Contributions of anterior cingulate cortex and basolateral amygdala to decision confidence and learning under uncertainty. *Nature Communications*, 10(1), 1–14.
- 5 **Rakhshan, M.**, Gupta, V., & Goodwine, B. (2019). On passivity of fractional order systems. *SIAM Journal on Control and Optimization*, 57(2), 1378–1389.
- 6 **Rakhshan, M.**, Vafamand, N., Mardani, M. M., Khooban, M.-H., & Dragičević, T. (2019). Polynomial control design for polynomial systems: A non-iterative sum of squares approach. *Transactions of the Institute of Measurement and Control*, 41(7), 1993–2004.
- 7 Pitarch, J. L., **Rakhshan, M.**, Mardani, M. M., & Shasadeghi, M. (2017). Distributed saturated control for a class of semilinear pde systems: An sos approach. *IEEE Transactions on Fuzzy Systems*, 26(2), 749–760.

- 8 **Rakhshan, M.**, Vafamand, N., Khooban, M. H., & Blaajberg, F. (2017). Maximum power point tracking control of photovoltaic systems: A polynomial fuzzy model-based approach. *IEEE Journal of Emerging and Selected Topics in Power Electronics*.
- 9 Vafamand, N., & **Rakhshan, M.** (2017). Dynamic model-based fuzzy controller for maximum power point tracking of photovoltaic systems: A linear matrix inequality approach. *Journal of Dynamic Systems, Measurement, and Control*, 139(5).
- 10 **Rakhshan, M.**, Moula, E., Shabani-nia, F., Safarinejadian, B., & Khorshidi, S. (2016). Active noise control using wavelet function and network approach. *Journal of Low Frequency Noise, Vibration and Active Control*, 35(1), 4–16.
- 11 **Rakhshan, M.**, Vafamand, N., Shasadeghi, M., Dabbaghjamesh, M., & Moeini, A. (2016). Design of networked polynomial control systems with random delays: Sum of squares approach. *International Journal of Automation and Control*, 10(1), 73–86.
- 12 Tajeddini, M. A., Safarinejadian, B., & **Rakhshan, M.** (2015). An unknown input observer for fault detection based on sliding mode observer in electrical steering assist systems. *AUT Journal of Modeling and Simulation*, 47(2), 31–43.
- 13 **Rakhshan, M.**, Shabani-nia, F., & ShaSadeghi, M. (2015). Anfis approach for tracking control of mems triaxial gyroscope. *Modeling and Simulation in Electrical and Electronics Engineering*, 1(1), 35–40.
- 14 Safarinejadian, B., Gharibzadeh, M., & **Rakhshan, M.** (2014). An optimized model of electricity price forecasting in the electricity market based on fuzzy timeseries. *Systems Science & Control Engineering: An Open Access Journal*, 2(1), 677–683.
- 15 **Rakhshan, M.**, Barzegar, H., Safarinejadian, B., & Ostovar, F. (2014). An automotive cruise control using fuzzy control optimized via extended kalman filter. *Majlesi Journal of Mechatronic Systems*, 3(4).
- 16 **Rakhshan, M.**, Khorshidi, S., & Safarinejadian, B. (2014). Active noise control in presence of disturbance using adaptive neuro fuzzy inference system. *Journal of Computational Intelligence and Electronic Systems*, 3(2), 99–105.
- 17 **Rakhshan, M.**, Mardani, M. M., ShaSadeghi, M., & Mardaneh, M. (2012). Relaxed stabilization conditions via sum of squares approach for the nonlinear polynomial model. *The Modares Journal of Electrical Engineering*, 12(1), 24–30.









Conference Proceedings

- 1 Pitarch, J., **Rakhshan, M.**, Mardani, M., Sadeghi, M., & de Prada, C. (2016). Distributed nonlinear control of a plug-flow reactor under saturation, In *Ifac-papersonline*. Elsevier.
- 2 Jarrahi, M. A., Samet, H., Raayatpisheh, H., Jafari, A., & **Rakhshan, M.** (2015). An anfis-based fault classification approach in double-circuit transmission line using current samples, In *International work-conference on artificial neural networks*. Springer, Cham.
- 3 **Rakhshan, M.**, Vafamand, N., & Shasadeghi, M. (2014). Nonlinear static state feedback control design for polynomial systems: A sum of squares approach, In *1st national conference on development of civil engineering, architecture, electricity and mechanical in iran*. civilica.











Research Experiences

- | | |
|-------------|---|
| 2017 – now |  Dartmouth College, NH, USA: Interactions of sensorimotor processes in the context of value-based decision making |
| 2018 – 2019 |  Dartmouth College, NH, USA: Simultaneous decoding of attentional and reward modulations in human EEG |


Research Experiences (continued)

- 2016 – 2017  **University of Notre Dame, IN, USA:** Noise effects on neural networks
- 2015 – 2016  **University of Notre Dame, IN, USA:** Intelligent Transportation Network Control
- 2013 – 2015  **Shiraz University of Technology, Shiraz, Iran:** Sum of Squares-based stabilization conditions for nonlinear systems
- 2011 – 2013  **Shiraz University, Shiraz, Iran:** Remotely operated underwater vehicle design and build
- 2012 – 2012  **Shiraz University, Shiraz, Iran:** PCB Rogowski coil design and build
-  **Shiraz University, Shiraz, Iran:** Low frequency sonic flow meter design and build
- 2011 – 2011  **Shiraz University, Shiraz, Iran:** Sound array and object tracking design and build
-  **Cornell University, NY, USA:** Solar desalination systems prototyping

Teaching Experiences

- Winter 2020  **Dartmouth College, NH, USA:** Principles of Human Brain Mapping with fMRI (TA),
Lecturer: Prof. Wager
- Fall 2019  **Dartmouth College, NH, USA:** Laboratory in Psychological Science (TA), Lecturer:
Prof. Brown
- Spring 2019  **Dartmouth College, NH, USA:** Statistics (TA), Lecturer: Prof. Soltani
- Spring 2018  **Dartmouth College, NH, USA:** Laboratory in Psychological Science (TA), Lecturer:
Prof. Gobbini
- Spring 2017  **University of Notre Dame, IN, USA:** Electronics I (TA), Lecturer: Prof. Chisum
- Spring 2016  **University of Notre Dame, IN, USA:** Power Systems Analysis and Electrical Machines
(TA), Lecturer: Prof. Lemmon
- Fall 2015  **University of Notre Dame, IN, USA:** Signal and Systems (TA), Lecturer: Prof.
Hochwald
- Fall 2013a  **Shiraz University, Shiraz, Iran:** Operations Research (TA), Lecturer: Prof. Dehghani
- Fall 2013b  **Shiraz University, Shiraz, Iran:** Digital Control Systems (TA), Lecturer: Prof.
KarimAghaei
- Spring 2013  **Shiraz (Students' Research and Entrepreneurship Center), Shiraz, Iran:** Applied
Electronics and Digital Circuits, Lecturer: Mohsen Rakhshan


Teaching Experiences (continued)

Fall 2012  **Shiraz (Students' Research and Entrepreneurship Center), Shiraz, Iran:** Applied Electronics and Digital Circuits, Lecturer: Mohsen Rakhshan





 **Shiraz Payam Noor (Students' Research and Entrepreneurship Center), Shiraz, Iran:** Applied Electronics and Digital Circuits, Lecturer: Mohsen Rakhshan

Working Experiences

2014  **Co-founder:** ARTIN Sanaat Kusha Company co-founder (smart irrigation systems), Shiraz, Iran



2013  **Intern:** Electrical Engineering intern in Shiraz Refinery, Shiraz, Iran

Skills











Languages	 Persian (native), English (professional), French (intermediate), Arabic (intermediate), German (beginner), Spanish (beginner).
Coding	 MATLAB/Octave (professional), Python (intermediate), C/C++ (beginner), R (beginner), ROS (beginner), Julia (beginner).
Software	 MNE EEG Toolbox, Codevision AVR, Altium, Pspice, Proteus, multisim, Labview, Comsol, \LaTeX
Misc.	 Advanced academic knowledge in machine learning and data science. Basic academic knowledge in object tracking, MEMS and NANO technology.

Miscellaneous Experience


Awards and Achievements

2015  **Valero Ph.D. Scholarship**, University of Texas at San Antonio, TX, USA.
 **First rank**, among all the students of the Engineering school with GPA 4/4, Shiraz University of Technology, Shiraz, Iran.

Peer Review Services

-  PLOS Computational Biology
-  IEEE Transactions on Neural Networks and Learning Systems
-  IEEE transaction on Cybernetics
-  IEEE Transactions on Cognitive and Developmental Systems
-  IEEE Transactions on Systems, Man, and Cybernetics
-  IEEE Conference on Decision and Control
-  Neurocomputing
-  Nonlinear Dynamics
-  International Journal of Systems Science
-  Journal of Dynamic Systems, Measurement, and Control

Memberships

-  Student member of IEEE
-  Member of The New York Academy of Sciences

Miscellaneous Experience (continued)

- Member of American Association for the Advancement of Science
- Member of Society for Neuroscience (SfN)
- Member of Society for Neuroeconomics (SNE)

Certification

- 2020 **BCI & Neurotechnology Spring School**, By g.tec medical engineering GmbH, Austria.
- 2019 **Medical Neuroscience**, By Coursera (Duke University), USA.

Interests

- Hiking
- Running
- Traveling

References

Available on Request