

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: *Neural mechanism of decision making under value and perceptual uncertainty.*
- 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



- 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 **Rakhshan, M.**, Gupta, V., & Goodwine, B. (2019). On passivity of fractional order systems. *SIAM Journal on Control and Optimization*, 57(2), 1378–1389.
- 5 **Rakhshan, M.**, Stolyarova, A., 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.
- 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 Pitarch, J., **Rakhshan, M.**, Mardani, M., Sadeghi, M., & de Prada, C. (2016). Distributed nonlinear control of a plug-flow reactor under saturation. *IFAC-PapersOnLine*, 49(24), 87–92.
- 11 **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.
- 12 **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.
- 13 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.
- 14 **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.
- 15 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.
- 16 **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).
- 17 **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.
- 18 **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 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.
- 2 **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: Value-based decision making and attention |
| 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 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
- Fall 2012  **Shiraz (Students' Research and Entrepreneurship Center), Shiraz, Iran:** Applied
Electronics and Digital Circuits, Lecturer: Mohsen Rakhshan

Teaching Experiences (continued)

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

Miscellaneous Experience (continued)

Certification

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

Interests

-  **Hiking**
-  **Running**
-  **Travelling**

References

Available on Request