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., Dabbaghjamanesh, 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, architecure,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 Techonology, 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**

- **Traveling**

References

Available on Request