

Mohsen Rakhshan, Ph.D. candidate

✉ mohsen.rakhshan.gr@dartmouth.edu

🌐 <https://mrakhsha.github.io>

🌐 <https://www.linkedin.com/in/mohsen-rakhshan-aaaa8270/>

Education

- 2017 – now 📖 **Ph.D., Dartmouth College, NH, USA** in Computational and Cognitive Neuroscience.
Research title: *Modulations of sensorimotor processing during 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 **Rakhshan, M.**, Schafer, R., Moore, T., & Soltani, A. (n.d.). Contribution of the frontal eye field to adaptive target selection. *Under review in Current Biology.*
- 2 Soltani, A., **Rakhshan, M.***, Schafer, R*, Burrows, B., & Moore, T. (2021). Separable influences of reward on visual processing and choice. *Journal of Cognitive Neuroscience*, 33(2), 248–262.
🔗 https://doi.org/10.1162/jocn_a_01647
- 3 **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.
🔗 https://doi.org/10.1162/jocn_a_01516
- 4 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. 🔗 <https://doi.org/10.1007/s00500-019-04152-7>
- 5 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.
🔗 <https://doi.org/10.1038/s41467-019-12725-1>
- 6 **Rakhshan, M.**, Gupta, V., & Goodwine, B. (2019). On passivity of fractional order systems. *SIAM Journal on Control and Optimization*, 57(2), 1378–1389. 🔗 <https://doi.org/10.1137/17M1126230>
- 7 **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. 🔗 <https://doi.org/10.1177/0142331218793476>

- 8 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. <https://doi.org/10.1109/TFUZZ.2017.2688379>
- 9 **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*. <https://doi.org/10.1109/JESTPE.2017.2708815>
- 10 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). <https://doi.org/10.1115/1.4035240>
- 11 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. <https://doi.org/10.1016/j.ifacol.2016.10.760>
- 12 **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. <https://doi.org/10.1177/0263092316628260>
- 13 **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. <https://doi.org/10.1504/IJAAC.2016.075146>
- 14 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. *International Work-Conference on Artificial Neural Networks*, 225–236. https://doi.org/10.1007/978-3-319-19222-2_19
- 15 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. <https://doi.org/10.22060/MISCJ.2015.568>
- 16 **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. <https://doi.org/10.22075/mseee.2015.240>
- 17 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. <https://doi.org/10.1080/21642583.2014.970733>
- 18 **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).
- 19 **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. <https://doi.org/10.1166/jcies.2014.1082>
- 20 **Rakhshan, M.**, Vafamand, N., & Shasadeghi, M. (2014). Nonlinear static state feedback control design for polynomial systems: A sum of squares approach. *1st National Conference on Development of Civil Engineering, Architecture, Electricity and Mechanical in Iran*.
- 21 **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.

Grants and Fellowships




Grants

- 2018  **Assisting in writing NIH grant (visualization)**, Dartmouth College, NH, USA.
- 2016  **Assisting in writing NSF grant (literature review)**, University of Notre Dame, NH, USA.

Fellowships

- 2021  **Schmidt Science Fellowship (under review)**, elected by Dartmouth College, NH, USA.
-  **E.E. Just Graduate Fellowship**, Dartmouth College, NH, USA.










Mentoring Experiences

- 2021 – now  **Dartmouth College, NH, USA:** Co-mentoring E.E. Just First-Year Graduate Fellows and Undergraduate Fellows
-  **Dartmouth College, NH, USA:** Mentoring undergraduate students through Undergraduate Advising and Research program
- 2017 – now  **Dartmouth College, NH, USA:** Mentoring undergraduate students through Women in Science Project



Research Experiences

- 2017 – now  **Dartmouth College, NH, USA:** Modulations of sensorimotor processing during value-based decision making
- 2018 – 2019  **Dartmouth College, NH, USA:** Simultaneous decoding of attentional and reward modulations in human EEG
- 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
- 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).

Skills (continued)











- 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






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)

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