

*The Revelations of Devout and Learn'd
Are all but Stories, which, awoke from Sleep*

*Who rose before us, and as Prophets burn'd,
They told their comrades, and to Sleep return'd*
Omar Khayyam (translated by Edward FitzGerald)



RESUME (September 2023)

Ali Foroutannia (IEEE Student Member)

Research Assistant of Center of Excellence on Soft Computing and Intelligent Information Processing, Ferdowsi University of Mashhad, Iran

Research Assistant of FUM Center of Advanced Rehabilitation and Robotics Research, Ferdowsi University of Mashhad, Iran

Lecturer in Department of Biomedical Engineering, University of Neyshabur, Iran

Click Logo



Personal Details:

Nationality: *Iranian*

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ORCID ID: 0000-0002-3385-549X

Researcher ID: W-3920-2017

Education:

- Ph.D. in Biomedical Engineering, 2024 Feb – Current, ...
- **M.Sc.** in Biomedical Engineering (Bioelectric field), 2018^{Sep} - 2021^{Sep}, Ferdowsi University of Mashhad, American GPA: 2.94/4 - Iranian GPA: 14.57/20
Thesis: Deep Learning-based Joint Torque Prediction for Assistive Lower Limb Exoskeleton Robots Using Electromyography (GPA: 18.5/20)
Seminar: Electromyography in estimating the required torque of exoskeleton robot using fuzzy logic and neural network (GPA: 19/20)
Supervisor: Prof. Mohammad Reza Akbarzadeh Totonchi, PhD ([Scholar](#), [Home page](#))
Co-Supervisor: Prof. Alireza Akbarzadeh Totonchi, PhD ([Scholar](#), [Home page](#))
Dr. Ali Moradi, MD, PhD
- **B.Sc.** in Electrical Engineering (Control field), 2014^{Sep} - 2018^{June}, University of Neyshabur, American GPA: 3.683/4 - Iranian GPA: 17.46/20
Thesis: Group Analysis of Resting State Networks by ICA Dual Regression in Parkinson disease: An fMRI Study (GPA: 20/20)
Supervisor: Dr. Mahdieh Ghasemi ([Scholar](#), [Home page](#))
Co-Supervisor: Dr. Alireza Rowhanimanesh ([Scholar](#), [Home page](#))
- **Diploma** in Mathematics and Physics, 2010^{Sep} - 2013^{June}, Hakim Nezami High School, Neyshabur, Iranian GPA: 17.32/20.

Professional Experience:

Dec 2018 – Present	Research Assistant of Center of Excellence on Soft Computing and Intelligent Information Processing, Ferdowsi University of Mashhad, Iran
March 2019 – Present	Research Assistant of FUM Center of Advanced Rehabilitation and Robotics Research, Ferdowsi University of Mashhad, Iran
Sep 2022 – Present	Lecturer in Department of Biomedical Engineering, University of Neyshabur, Iran
Sep 2017 - Sep 2018	Research Assistant of Neural Engineering Lab, Department of Biomedical Engineering, University of Neyshabur, Neyshabur, Iran
Jul 2017 - Sep 2017	Trainee in Instrumentation Control Engineering of Khorasan Steel Complex, Neyshabur, Khorasan-e Razavi Province, Iran
Jun 2014 - Jul 2017	Research Assistant of Multi-Scale Robotics Lab, Department of Electrical Engineering, University of Neyshabur, Neyshabur, Iran

Research / Industrial Interest:

- Intelligent Control, Modeling and Optimization of Complex Systems /Advanced Control Systems
 - Artificial Intelligence / Computational Intelligence (Especially Fuzzy Logic, Neural Networks, Genetic Algorithms, Evolutionary Optimization, Deep Learning) / Pattern Recognition
 - Computer Vision / Machine Learning / Deep Learning
 - Robotics and Applied Intelligent Systems / Biomedical Robotics
 - Robotics / Micro Robotics / Exoskeleton Robot / Swarm Robotics
 - Biomedical Signal Processing / Signal Processing / Digital Signal Processing / Signal Processing for Communication / Image Processing
 - Cognitive Neuroscience / Brain Functional Modelling / Brain Connectivity / Neuroimaging / Resting State fMRI / Parkinson Disease / linguistics Processing / EEG / ERP / fMRI
 - Complex Systems / Nonlinear Dynamics / Chaotic System
-

Publications & Patent:

- **Journal Papers:**

1. Monireh Mahjoob, Javad Heravian Shandiz, Ali Mirzajani, Maryam Behboodi, Hamid Sharini, Neda Nakhjavanpour, **Ali Foroutannia**. “**Characterizing the visual cortex function in cognitive task-induced mental load: an fMRI study**” *Brain Connectivity* (2024). Doi: <https://doi.org/10.1089/brain.2023.0049> (Impact Factor 3.7, Q2, Corresponding Author)
2. **Ali Foroutannia**, Mahdiah Ghasemi, “**Predicting cortical up-down state transitions with bidirectional LSTM network: a simulation study**”. *Nonlinear Dynamics* (2023): 1-24. Doi: <https://doi.org/10.1007/s11071-023-08251-x> (Impact Factor 5.741, Q1, Corresponding Author)
3. **Ali Foroutannia**, Mohammad Reza Akbarzadeh Totonchi, Alireza Akbarzadeh Totonchi, S.Mohammad Tahamipour-Z, “**Adaptive fuzzy impedance control of exoskeleton robots with electromyography-based convolutional neural networks for human intended trajectory estimation**”. *Mechatronics Journal* 91 (2023): 102952. Doi: <https://doi.org/10.1016/j.mechatronics.2023.102952> (Impact Factor 3.967, Q1)
4. Mahdiah Ghasemi, **Ali Foroutannia**, Fatemeh Nikdelfaz, “**A PID controller for synchronization between master-slave neurons in fractional-order of neocortical network model**”. *Journal of Theoretical Biology* 556 (2023): 111311. Doi: <https://doi.org/10.1016/j.jtbi.2022.111311> (Impact Factor 2.405, Q1)
5. **Ali Foroutannia**, Mohammad-R. Akbarzadeh-T, Alireza Akbarzadeh Totonchi, “**A deep learning strategy for EMG-based joint position prediction in hip exoskeleton assistive robots**”. *Biomedical Signal Processing and Control* 75 (2022): 103557. Doi: <https://doi.org/10.1016/j.bspc.2022.103557> (Impact Factor 4.957, Q1)
6. **Ali Foroutannia**, Fahimeh Nazarimehr, Mahdiah Ghasemi, Sajad Jafari, “**Chaos in memory function of sleep: A nonlinear dynamical analysis in thalamocortical study**”. *Journal of Theoretical Biology* (2021): 110837. Doi: <https://doi.org/10.1016/j.jtbi.2021.110837> (Impact Factor 2.405, Q1)
7. Mahdiah Ghasemi, **Ali Foroutannia**, Abbas Babajani-Feremi. “**Characterizing resting-state networks in Parkinson’s disease: A multi-aspect functional connectivity study**”. *Brain and Behavior* 11.5 (2021): e02101. Doi: <https://doi.org/10.1002/brb3.2101> (Impact Factor 3.44, Q2).
8. Mahdiah Ghasemi, Mojtaba Zarei, **Ali Foroutannia**, Sajad Jafari. “**Study of functional connectivity of central motor system in Parkinson’s disease using copula theory**” *Biomedical Signal Processing and Control* 65 (2021): 102320. Doi: <https://doi.org/10.1016/j.bspc.2020.102320> (Impact Factor 4.957, Q1)
9. **Ali Foroutannia**, Mahdiah Ghasemi, Fatemeh Parastesh, Sajad Jafari, Matjaž Perc. “**Complete dynamical analysis of a neocortical network model**” *Nonlinear Dynamics* 100 (2020): 2699-2714. Doi: <https://doi.org/10.1007/s11071-020-05668-6> (Impact Factor 5.741, Q1)
10. Mahdiah Ghasemi, **Ali Foroutannia**. “**Disruption of the brain resting state networks in Parkinsonism.**” *The Neuroscience Journal of Shefaye Khatam* 7, no. 1 (2019): 23-33. Doi: <http://dx.doi.org/10.29252/shefa.7.1.23> (Academic Journal)

- **Conference Papers:**

1. **Ali Foroutannia**, Fatameh Torkaman Pary, “**A comprehensive system for detecting fake news using deep learning and supervised machine learning algorithms**”. (Prepared)
2. **Ali Foroutannia**, Milad shoryabi, Amirali Alizadeh Anaraki, Alireza Rowhanimanesh. “**SIN: a programmable platform for swarm robotics**”. 26th International Computer Conference, Computer Society of Iran Tehran, Iran, 3-4 March 2021. ([Click the link](#))
3. Milad shoryabi, **Ali Foroutannia**, Alireza Rowhanimanesh. “**A 3D deep learning approach for classification of gait abnormalities using microsoft kinect V2 sensor**”. 26th International Computer Conference, Computer Society of Iran Tehran, Iran, 3-4 March 2021. ([Click the link](#))
4. Milad Shoryabi, **Ali Foroutannia**, Alireza Rowhanimanesh, Mahdieh Ghasemi, “**A novel neural network classification for EEG in brain-computer interface**”, 7th Iranian Joint Congress on Fuzzy and Intelligent Systems, Bojnord, Iran, 29 Jan 2019. ([Click the link](#))
5. Mahdieh Ghasemi, **Ali Foroutannia**. “**Connectivity analysis of resting state networks in Parkinson's disease using partial directed coherence approach**”, 2nd Iranian Symposium on Brain Mapping Updates, Tehran, Iran, October 10-11, 2018. ([Click the link](#))
6. Mahdieh Ghasemi, **Ali Foroutannia**. “**Machine learning methods on resting state fMRI network in Parkinson's disease**”, Presented as Poster in the 5th Iranian Human Brain Mapping Congress, Tehran, Iran, Sep 29 – Oct 1, 2018. ([Click the link](#))
7. Negar Adibi, **Ali Foroutannia**, Alireza Rowhanimanesh, “**Designing and implementing a monitoring and recording system for heart rate the internet of things**”, (in Persian), International Conference on Interdisciplinary Studies in Electrical, Computer, Mechanical and Mechatronics Engineering in Iran and the Islamic World., Tehran, Iran, Sep 22,2018. ([Click the link](#))
8. Mahdieh Ghasemi, **Ali Foroutannia**. “**Group analysis of resting state networks by ICA dual regression in Parkinson disease**”, Presented as Poster in the Brain Engineering & Computational Neuroscience Conference (BECNC), IPM, Tehran, Iran, January 31, 2018. ([Click the link](#))
9. **Ali Foroutannia**, Mahdieh Ghasemi. “**How do intrinsic resting functional networks in Parkinson's disease alter?**”, Presented as Poster in the 4th Iranian Human Brain Mapping Congress, Tehran, Iran, October 25, 2017. ([Click the link](#))
10. Mahdieh Ghasemi, **Ali Foroutannia**, Ali Amiri khorhe, “**Group differences of resting state network in fMRI data of Parkinson disease using independent component analysis**”, Presented in the 6th International Conference on Research in Engineering, Science and Technology, London, United Kingdom, June 2, 2017. ([Click the link](#))
11. **Ali Foroutannia**, Amirali Alizadeh Anaraki, Milad Shoryabi, Alireza Rowhanimanesh, “**Swarm intelligent micro robots based on artificial attraction-repulsion forces**”, (in Persian), Presented in the 1st International Conference on New Perspective in Electrical & Computer Engineering, Tehran, Iran, Sep 9,2016. ([Click the link](#))

- **Patent**

1. **A. Foroutannia**, A. Akbarzadeh-Totonchi, M-R. Akbarzadeh-Totonchi, R. Sedeh, A. Makhdomi, A.Shiva, A-Kh. Maleki, GH-R. Jafari, A. Moradi. “**Electromyographic system with adjustable automatic amplifier for each muscle**”. Iran, Patent Number: 107343 (6/7/2022); Patent Application Number: 140050140003002933; A61B 5/04; A61B 5/0488; A61N 1/04. ([Click the link](#))
2. **A. Foroutannia**, A. Akbarzadeh-Totonchi, M-R. Akbarzadeh-Totonchi, A-Kh. Maleki, A. Makhdomi, A.Shiva, GH-R. Jafari, R. Sedeh A. Moradi. “**Active dry electrodes for recording electromyography signals in muscle**”. Iran, Patent Number: 105423 (16/10/2021); Patent Application Number: 140050140003002928; A61B 5/00. ([Click the link](#))
3. **A. Foroutannia**, A. Alizadeh Anaraki, M. Shoryabi, A. Rowhanimanesh. “**SIN: the real open-source test environment for implementing swarm algorithms**”. Iran, Patent Number: 97026 (22/10/2018); Patent Application Number: 139650140003000699; G05B 19/418; G06N 3/00. ([Click the link](#))

Projects:

- Jun 2019 – Nov 2021; Role: Research fellow; “**Assistive lower limb exoSkeleton**”; The National Institute for Medical Research Development of Iran (NIMAD) [Grant No. 962297]. (Supervisor: Prof. Alireza Akbarzadeh Totonchi)
- Nov 2020 – Nov 2021; Role: Research fellow; “**Deep learning-based joint torque prediction for assistive lower limb exoskeleton robots using electromyography**”; FUM Center of Advanced Rehabilitation and Robotics Research, and Center of Excellence on Soft Computing and Intelligent Information Processing, Ferdowsi University of Mashhad, Mashhad, Iran [Grant No. 101120]; (Supervisor: Prof. Mohammad Reza Akbarzadeh Totonchi)
- July 2019 – April 2019; Role: Research fellow; “**Linguistic comparison of bilinguals using EEG**”; Biomedical Lab, University of Neyshabur, Neyshabur, Iran [Grant No. XXXX]. (Supervisor: Dr. Mehdi Mehrani)
- Sep 2017 – July 2019; Role: Research fellow; “**Comparison of independent component networks in resting state fMRI data of Parkinsonism and healthy individuals using dual regression**”; Neural Engineering Laboratory, Department of Biomedical Engineering, University of Neyshabur, Neyshabur, Iran [Grant No. 965988]. (Supervisor: Dr. Mahdiah Ghasemi)
- Aug 2015 – Sep 2017; Role: Research fellow; “**SIN: a macroscopic physical model for swarm intelligent nano-robots**”, Multi-scale Robotics Lab, University of Neyshabur, Neyshabur, Iran [Grant No. XXXX]. (Supervisor: Dr. Alireza Rowhanimesh)

Journal Reviewer:

- **Chaos, Solitons & Fractals** (Impact Factor 7.8, Q1)
- **Nonlinear Dynamics** (Impact Factor 5.741, Q1)
- **Scientific Reports – Nature Portfolio** (Impact Factor 4.996, Q1)
- **Computational Intelligence and Neuroscience** (Impact Factor 3.877, Q1)
- **IEEE Access** (Impact Factor 3.758, Q1)
- **IEEE Sensor** (Impact Factor 4.325, Q1)
- **IEEE Transactions on Neural Systems and Rehabilitation Engineering** (Impact Factor 4.9, Q1)
- **Brain Connectivity** (Impact Factor 3.979, Q1)
- **Iranian Journal of Science and Technology - Transactions of Electrical Engineering** (Impact Factor 1.723, Q2)
- **Scientia Iranica** (Impact Factor 1.387, Q3)
- **Indonesian Journal of Electrical Engineering and Computer Science** (Q3)
- **Journal of Applied Nonlinear Dynamics** (Q4)
- **Iraqi Journal for Electrical and Electronic Engineering**
- **Frontiers in Network Physiology**

Technical Skill and Expertise:

- Computer Vision / Machine Learning: C++/C, Python.
- Data Science: MATLAB, R, Python (Tensorflow, Keras).
- Electrical: Proteus, Code Vision, Android (Eclipse), Arduino, OrCAD, Bascom, PLC S7 (200, 300, 400, 1200, Logo), TIA Portal V13, Portal, Altium Designer, AutoCAD, Lab VIEW
- Neuroscience: FSL, FREESURFER, CONECTOM, EEGLAB, BrainNet Viewer, SPM, Afni, Graph-Var
- Mechanical: Solid Work, Cinema 4D, AutoCAD.
- Web: HTML, JavaScript.
- Typesetting: Latex, Microsoft, EndNote, Mendeley
- Operating system: Linux Centos & Ubuntu, Windows

Honors and Awards:

- **Nationwide M.Sc. Best Thesis Award from IEEE Iran Section**
- **Best M.S. Thesis Award in Electrical Engineering Department Best M.S. Thesis Award in Electrical Engineering Department**, Issued by Ferdowsi university of Mashhad
- **Top technology of Partlastic Industrial Group Innovation and Acceleration Center**, ([Partlastic website](#), in 2023)

- **First place of Iraj Yazdan Bakhsh technological award at the Ferdowsi University of Mashhad (Saipa Quik car prize), ([Link News](#), in 2023)**
- **Student Brilliant Talent of Ferdowsi University of Mashhad**
- **Scholarship for M.Sc. -Biomedical Engineering - Ferdowsi University of Mashhad (waiver tuition)**
- **First place of Best Poster Presentation Award, 4th Iranian Human Brain Mapping Congress in 2017**
- **Ranked 2nd in the country**, attended the Demo League of 3th Khayyam National Robotics Competitions, Neyshabur, Iran, Sep 3-5 2015. (Team Title: "SIN: Swarm Intelligent Nanorobots")
- **Best Superior Researcher at University of Neyshabur, Neyshabur, Iran (2017 & 2016)**
- **The second student of Electrical Engineering in B.Sc. (2014-2018)**
- **First Class Honors., in B.S degree**
- **Scholarship for B.Sc. - Electrical Engineering - University of Neyshabur (waiver tuition)**
- **First tournament Mathematics at the University of Neyshabur 2016**
- **More ...**

Invited Lectures / Workshops / Exhibitions:

- **“Neural network and its applications using MATLAB”**, 2020 Joint Congress on Computational Intelligence, Ferdowsi University of Mashhad, Mashhad, Iran
- **“Brain signal processing theoretically and practically”**, University of Neyshabur, 2018.
- **“Summery of swarm intelligent nano-robot”**, University of Neyshabur, 2018.
- **“Swarm intelligent natural nano-robot”**, University of Neyshabur, Jan 7, 2016.
- **“A live show of SIN: a macroscopic physical model for swarm intelligent nano-robots, multi-scale robotics lab, University of Neyshabur”**, Attended the Demo League in Khayyam National Robotics Competitions, Neyshabur, Iran, Sep 3-5, 2015
- **More ...**

Teaching Experience (2014-present):

1. **Undergraduate Courses:**
Electrical Circuit 2; Medical information technology; Special Topics Courses: Chaos; Soft Computing (TA); Differential Equations (TA); Electrical Circuit 1 (TA); Electronics 1 & 2 (TA); Linear Control (TA); Model Sim; Proteus; MATLAB; Arduino.
2. **High School Courses:**
Physics; Chemistry; Mathematics; Statistics; Geometry; Computer Basics.
3. **Universities or High School:**
Ferdowsi University of Mashhad; University of Neyshabur; Hakim Nezami High School; Tutoring.

Media Coverage and Recognition:

- **“TV interview with IRIB TV1 channel as the best technology thesis in Iran”**
<https://telewebion.com/episode/0x29bb94d> & <https://telewebion.com/episode/0x29c45a3>
- **“Mehr News, Irib News, Sahebkhbar News, Ana News, Yjc News, roboiaun.com”** in Sep 2015(3-5), A Macroscopic Physical Model for Swarm Intelligent Nano-robots "SIN", Multi-scale Robotics Lab, University of Neyshabur. (<http://iusnews.ir/fa/print/190531/>, <http://www.dastavardha.com/index.aspx?pid=99&articleid=181008>, <https://sinapress.ir/news/print/25433>, <http://www.farsnews.com/printable.php?nn=13941022000601>,)

Language: Persian (Mother tongue), English (Professional working proficiency)

Hobbies & Interests: Family, Climb, Music.

References:

- Dr. Sajad Jafari, PhD ([Scholar](#))
 Prof. Mohammad Reza Akbarzadeh Totonchi, PhD ([Scholar](#))
 Prof. Alireza Akbarzadeh Totonchi, PhD ([Scholar](#))
 Dr. Fahimeh Nazarimehr, PhD ([Scholar](#))
 Dr. Fatemeh Parastesh, PhD ([Scholar](#))
 Dr. Alireza Rowhanimanesh, PhD ([Scholar](#))
 Dr. Mahdieh Ghasemi, PhD ([Scholar](#))