Mehdi Borjkhani

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Education

University of Tehran, Ph.D. Biomedical Engineering 2018

Tehran Polytechnic, M.S.C Biomedical Engineering 2009

Urmia University, B.S.C Electronic and Electrical Engineering 2005

Publications

Journal Articles

[1] Ca2+ Channels Involvement in Low-Frequency Stimulation-Mediated Suppression of Intrinsic Excitability of Hippocampal CA1 Pyramidal Cells in a Rat Amygdala Kindling Model. Z. Ghotbeddin, S. Heysieattalab, **M. Borjkhani**, J. Mirnajafi-Zadeh, Saeed Semnanian, N. Hosseinmardi, M. Janahmadi. Neuroscience (2019). IF=3.2.

[2] Hyperexcitability of hippocampal CA1 pyramidal neurons in male offspring of a rat model of autism spectrum disorder (ASD) induced by prenatal exposure to valproic acid: A possible involvement of Ih channel current. R. Hajisoltani, S. A. Karimia, M. Rahdara, S. Davoudi, **M. Borjkhani**, N. Hosseinmardi, G. Behzadi, M. Janahmadi. Brain Research (2019), IF=3.12.

[3] Computational modeling of opioid-induced synaptic plasticity in hippocampus. **M. Borjkhani**, F. Bahrami, M. Janahmadi, PloS one (2018), IF=3.

[4] Formation of opioid-induced memory and its prevention: a computational study. **M.**

Borjkhani, F. Bahrami, M. Janahmadi. Frontiers in Computational Neuroscience (2018), IF= 2.65.

[5] Period doubling and route to chaos in reduced graphene oxide, an experimental evidence, M. Faraji, M. A. Sharif, **M. Borjkhani**, K. Ashabi, Journal of Molecular Liquids (2018), IF=4.5.

[6] Do Opioids Contribute to Pathological Memory Formation? Introducing a Computational Model to Meet the Question, **M. Borjkhani**, F. Bahrami, M. Janahmadi, Basic and Clinical Neuroscience (2017), IF=0.7.

[7] Chaotic fractional-order model for muscular blood vessel and its control via fractional control scheme, M.P. Aghababa, **M. Borjkhani**, Complexity (2014), IF=3.5.

[8] Application of GA, PSO, and ACO algorithms to path planning of autonomous underwater vehicles, M.P. Aghababa, M.H. Amrollahi, **M. Borjkhani**, Journal of Marine Science and Application (2012), IF=0.43.

[9] Temporal modulation instability, transition to chaos in non-feedback biased photorefractive media, M.A. Sharif, **M. Borjkhani**, B. Ghafary, Optics Communications (2014), IF=1.48.

[10] Low power MICS band Transmitter for Bio-Medical Sensor Nodes with Driving Capability by Energy Harvesting Systems H. Borjkhani, S. Sheikhaei, **M. Borjkhani**, Iranian Journal of Biomedical Engineering (2014).

[11] Kinematical Modeling of the Writing Process using Model Predictive Control, **M. Borjkhani**, F. Towhidkhah, Iranian Journal of Biomedical Engineering (2010).

Conference Presentations

[1] Mathematical modeling of opioid receptor function in hippocampus. **M. Borjkhani**, F. Bahrami, M. Janahmadi, 4th Basic and Clinical Neuroscience Congress, Tehran, Iran (2015).

[2] M. Bahrami, **M. Borjkhani**, G. A. Hossein-Zadeh, F. Bahrami, "Lyapunove exponent as a feature to distinguish patients with Alzheimer's disease and healthy controls using resting-state fMRI BOLD signals," 1st Iranian Conference on Human Brain Mapping, Tehran, Iran (2014).

[3] A mathematical model for neuron astrocytes interactions in hippocampus during addiction, **M. Borjkhani**, A. Mahdavi, F. Bahrami, 21st Iranian Conference on Biomedical Engineering (2014).

[4] Probabilistic study of different synchronization measures: Application to electroencephalographic signals, **M. Borjkhani**, A.H. KhazeniFard, A. Rahimpour, 3rdBasic and Clinical Neuroscience Congress (2014).

[5] Low power current starved sub-harmonic injection locked ring oscillator, H. Borjkhani, S. Sheikhaei, **M. Borjkhani**, 22nd Iranian Conference on Electrical Engineering (2014).

[6] Chaotic behavior analysis in rest EEG signals of rats with Alzheimer's disease, **M. Borjkhani**, T. Toufighi, F. V. Farahani, 2nd Basic and Clinical Neuroscience Congress, Tehran, Iran (2013).

[7] Chaotic beam propagation through Chalcogenide glass fibers, M.A. Sharif, **M. Borjkhani**, Proc. of 12th International Young Scientists Conference Optics and High Technology Material Science – SPO, Kyiv, Ukraine (2011).

[8] The effect of magnetic fields on reduction of pain in human body, **M. Borjkhani**, M.A. Sharif, Proc. of Anesthesia International Congress, Ahvaz, Iran (2011).

[9] Telemedicine Applications for Healthcare, **M. Borjkhani**, N. Ezzati, National Electrical Congress, Urmia, Iran (2011).

[10] Noninvasive detection of fetal heart beat signal, **M. Borjkhani**, N. Ezzati, National Electrical Congress, Urmia, Iran

(2011).

[11] Intelligence control of power using GA-PID controller, S. Zaferanlouei, **M. Borjkhani**, Proc. of 4th International conference of Fuzzy information and engineering, Shomal university, Amol, Iran (2010).

[12] Modeling handwriting generation using Genetic Fuzzy PID controller, **M. Borjkhani**, GH. Jahedi, F. Towhidkhah, Proc. of 4th International conference of Fuzzy information and engineering, Shomal University, Amol, Iran (2010).

[13] Diagnosis of Parkinson diseases based on handwriting kinematics using fuzzy classifier, **M. Borjkhani**, M. Fallahnezhad, F. Towhidkhah, M.H. Moradi, Proc. of 4th International conference of Fuzzy information and engineering, Shomal university, Amol, Iran (2010).

[14] Simulation of nerve blocking by sinus/square biphasic high-frequency electrical current and suggested combined new waveform based on Hodgkin-Huxley model, S.B. Makooyi, A. Soltanzadeh, **M. Borjkhani**, Proc. of International Conference on Broadcast Technology and Multimedia Communication, Malaysia (2010).

[15] Conjugated Version of Electromagnetic Sensor Based on Mach-Zehnder Electro-Optical Modulator, M.A. Sharif, **M. Borjkhani**, A. Soltanian, Proc. of International Conference on Broadcast Technology and Multimedia Communication, Malaysia (2010).

[16] Non-Thermal Effects of Base Transceiver Stations on Human Health, **M. Borjkhani**, M.A. Sharif, 1st Congress on Bio-electro-magnetism, Qazvin, Iran (2010).

[17] Low-frequency electromagnetic fields biological effects on nervous system, **M. Borjkhani**, M.A. Sharif, 1st Congress on Bio-electro-magnetism, Qazvin, Iran (2010).

[18] Diagnosis Parkinson's Disease Using Reliable Handwriting Kinematic Features By Artificial Neural Network, **M. Borjkhani**, M. Ahmadlou, F. Towhidkhah, Proc. of International Conference on Biomedical and Interdisciplinary Research (published in Journal of Iran University of medical science), Tehran, Iran (2009).

[19] Modeling Writing Generation in Schizophrenia Patients using Model Predictive Control, **M. Borjkhani**, F. Towhidkhah, 10th International Congress on Medicine, Tehran, Iran (2009).

[20] Modeling Kinematic Features of Human Handwriting using Model Predictive Control, **M. Borjkhani**, F. Towhidkhah, Proc. of IEEE International Biomedical Engineering Conference, Cairo (2008).

[21] Extracting Reliable Handwriting Kinematic Features by using Neural Network for Diagnosis Schizophrenia Disease, **M. Borjkhani**, M. Ahmadlou, F. Towhidkhah, Proc of IEEE International Biomedical Engineering Conference, Cairo (2008).

[22] Writing Disorders in Schizophrenia Patients and Diagnosis of Disease Using Support Vector Machine, **M. Borjkhani**, H. Davandeh, F. Towhidkhah, 15th Iranian Conference on Biomedical Engineering, Mashhad, Iran (2008).

[23] Do Human Beings use Gestalts when Predicting Obstacle Movements, B. Taghizadeh, F. Towhidkhah, M.A. Pajouh, **M. Borjkhani**, 15th Iranian Conference on Biomedical Engineering, Mashhad, Iran (2008).

[24] Schizophrenia Diagnosis using a new Artificial Immune System based on writing patterns, **M. Borjkhani**, S. Jafari, F. Towhidkhah, H.R. Mohammadi, 16thIranian Electrical Engineering Conference, Tarbiat Modarres University, Iran (2008).

Graduate Courses

Dynamical Systems in Neuroscience

Biological Systems Modeling

Electrophysiology

Discrete signal processing

Biomedical signal processing

Functional Medical Imaging Systems

Stochastic Processes

Pattern Recognition

Estimation and System Identification

Artificial Neural Networks

Fuzzy Control

Neuro-muscular systems control

Research Interests

Computational Neuroscience

Statistical and Biomedical Signal Processing

Pattern Recognition, Estimation and System Identification

fMRI Data Analysis

Teaching Experience

Modeling and simulation in bio-mechatronic

Advanced engineering mathematics

An introduction to biomedical engineering

Physics - Electricity and Magnetism

Electrical Circuits I & II

Electronic I & II

Linear Control Systems

Process Control

Programming skills

C++

Matlab

Dynamical Systems and Bifurcation Analysis software (Matcont)

Dynamical systems analysis software (Xppaut)

fMRI analysis software (FSL)