Personal Information:

Name: Reza Shalbaf

Date of Birth: 3 Sep 1980

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Position: Assistance Professor of Institute for Cognitive Sciences Studies (ICSS), Tehran

Research Interests

- Computational and cognitive brain science
- Mathematical modeling of brain dynamics in cognitive sciences
- Biomarker to predict treatment response in psychological disorder
- Non-invasive Neuromodulation technologies and application in brain health
- Multi-channel EEG signal recording and analysis
- Time-frequency decompositions, chaos theory, Non-Linear Analysis
- Machine learning and pattern recognition

Education

2016-2017

Postdoc Researcher
University of British Colombia, Vancouver, Canada
Subjects: Studying dynamic functional connectivity and its relationships with brain disorder.
EEG Biomarker as predictor of response to rTMS in treatment resistant depression.

2008-2014

PhD in Biomedical Engineering
Iran University of Science and Technology, Tehran, Iran
Major: Bioelectric
Thesis Title: Measuring depth of anesthesia using combination of vital and brain signals

2003-2006

M.Sc in Biomedical Engineering
Amirkabir University of Technology, Tehran, Iran
Major: Bioelectric
Thesis: Lip reading by help of image processing to aid speech impaired people

1998-2003

B.Sc in Biomedical Engineering
Islamic Azad University, Tehran, Iran
Major: Bioelectric
Thesis: Design and Implementation of an Audiometry system

Patents

- Yaghoobzadeh A, Azizzadeh H, **Shalbaf R**, Kullman T, Tietz S, Lanzinger O; "Medical intelligent Ventilation System**"**; Saadat Co(Iran) and Heyer Co(Germany); European Patent Application, 2015

Publications
Journals

- Shalbaf A, **Shalbaf R**, Saffar M, Sleigh J, Monitoring the level of hypnosis using a hierarchical SVM system, Journal of clinical monitoring and computing (Springer Publication), 1-8, 2019
- **Shalbaf R,** Brenner C, Pang C, Blumberger DM, Downar JH, Daskalakis ZJ, Tham J, Lam RW, Farzan F, Vila-Rodriguez F, "Non-linear entropy analysis in EEG to predict treatment response to repetitive transcranial magnetic stimulation in Depression", Frontiers in Pharmacology 9, 1188, 2018
- Shalbaf A, Saffar M, Sleigh JW, **Shalbaf R**; Monitoring the Depth of Anesthesia Using a New Adaptive Neurofuzzy System, IEEE journal of biomedical and health informatics 22 (3), 671-677, 2018

- Mirsadeghi M, Behnam H, **Shalbaf R**, Jelveh Moghadam H. "Characterizing awake and anesthetized states using a dimensionality reduction method", Journal of medical systems (Springer Publication), 2016;40 (1), 13
- **Shalbaf R**, Behnam H, Sleigh JW, Steyn-RossDA, Steyn-RossML. "Frontal-temporal synchronization of EEG signals quantified by order patterns cross recurrence analysis during propofol anesthesia", IEEE Transactions on Neural Systems and Rehabilitation Engineering(IEEE Publication), 2015; 23:468-74
- Alizadeh-Sani Z, Shalbaf A, Behnam H, **Shalbaf R**, "Automatic computation of left ventricular volume change from Echocardiography images using nonlinear dimensionality reduction "Journal of Digital Imaging (Springer Publication), 2015, 28:91-8.
- **Shalbaf R**, Behnam H, Jelveh Moghadam H. "Monitoring depth of anesthesia using combination of EEG measure and hemodynamic variables", Cognitive Neurodynamics (Springer Publication), 2015, 9: 41–51.
- **Shalbaf R**, Behnam H, Sleigh JW, Steyn-Ross A, Voss LJ. "Monitoring the depth of anesthesia using entropy features and an artificial neural network", Journal of Neuroscience Methods (Elsevier Publication), 2013; 218, 17– 24.
- **Shalbaf R**, Behnam H, Sleigh JW, Voss LJ. "Measuring the effects of sevoflurane on electroencephalogram using sample entropy". Acta Anaesthesiologica Scandinavica Journal (Wiley Publication) 2012; 56:880–9.
- **Shalbaf R**, Behnam H, Sleigh JW, Voss LJ. "Using the Hilbert–Huang transform to measure the electroencephalographic effect of propofol". Physiological Measurement Journal (IOP Science Publication) 2012; 33:271–85.
- Hosseini PT, **Shalbaf R**, Nasrabadi AM. "Extracting a seizure intensity index from one-channel EEG signal using detrended fluctuation analysis and bispectral analysis". Journal of Biomedical Science and Engineering (Scientific Research Publication)2010; 3: 253-61.

Conferences

- NJ Ainsworth, A Leon, K Green, RF White, J Sung, G Smith, **R Shalbaf**. "Clinical response to electroconvulsive therapy among patients with treatment-refractory psychosis: the BC Psychosis Program experience", Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, 2018
- M Danilewitz, C Pang, D Aur, **R Shalbaf**, R Ge, J Brown, E McLellan, F Vila-Rodriguez. "The acute effects of a combined yoga and transcranial direct current stimulation on neurophysiological markers: preliminary data", Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, 2018
- **Shalbaf R**, Mehrnam AH, Behnam H. "Depth of Anesthesia Indicator Using combination of Complexity and frequency Measures", In Proceedings of IEEE Conference on Biomedical Engineering (ICBME2014), 26 - 28 December 2014, Iran, Tehran
- **Shalbaf R**, Behnam H, Jelveh Moghadam H. "The Brain Function Index as a depth of anesthesia indicator using complexity measures", In Proceedings of IEEE International Conference on Systems, Process & Control. (ICSPC 2013), Kuala Lumpur.
- **Shalbaf R**, Hosseini PT, Analoui M. "Epilepsy detection using detrended fluctuation analysis". In Proceedings of the IEEE International Conference on Wavelet Analysis and Pattern Recognition. 2009, china.
- **Shalbaf R**, Vafadoost M, Shalbaf A, Kahnamouei R. "Recognition of Six Digits from Lip Movement Using Color Image". In Proceedings of International Conference on Biomedical Engineering. 2008, Kuala Lumpur.
- **Shalbaf R**, Vafadoost M, Shalbaf A. "Extraction of Visual Speech features using deformable models for lip reading", Proceedings of 15th International Conference on Electrical Engineering, 2007, Iran. Tehran, Tele Communication Research Center.

- Shalbaf A, Vafadoost M, **Shalbaf R**. "Face recognition using RBF Neural-Network", Proceedings of 2th International Conference on Information Technology, 2005, Iran, Amirkabir University of Technology

Honors

2012 **Study Awards** from University of Waikato and University of Auckland in New Zealand.

2003 **2st** ranked among 1000 participants in M.Sc. entrance exam, scholar by ministry of health. Achieving this, I was exempted to do the military duty

Teaching Experiences

Lectures series in Institute for Cognitive Science Studies, Tehran:

Dynamical Systems in Neuroscience
(for PhD Students of Cognitive modeling and Artificial Intelligence)
Evaluation and Assessment methods in Cognitive Science
(for PhD Students of Cognitive modeling)
NeuroImaging
(for PhD Students of Artificial Intelligence)
Brain Signals Processing
(for PhD students of Cognitive modeling and Artificial Intelligence)
Cognitive Modeling
(for MSc Students of Cognitive Psychology)

Research Experiences and Grants

2012-2013 **Short Term Researcher**
University of Waikato, Hamilton, New Zealand

- Development of physics-based models of the brain to improve our understanding of loss of consciousness and epilepsy.
- Mathematical modeling and electroencephalographic correlates of the transition between conscious states.
- Investigation into the effect of the general anaesthetics on short- and long-range coupling of neuronal population activity in the mouse neocortical slice.

2004 **Research Assistant**
Amirkabir University of Technology, Tehran, Iran

- Automatic detection of cardiac arrhythmia using body surface electrocardiogram signal
- Analog and digital circuits design to obtain biological signal including Respiration, Electrocardiogram, Saturation pulse oximetry and blood pressure.