

{S.-Mohammad~P.~Firoozabadi}

received the B.Sc. Degree in electronics engineering from University of **Tabriz**, in 1987, the M.Sc. degree in electronics engineering from **Amir-Kabir** University of Technology, Tehran, in 1991, and the Ph.D. Degree in electrical engineering (biomedical engineering) from Tarbiat **Modares** University, Tehran, Iran, in 1997.

Dr. Firoozabadi currently serves as a Professor of **Biomedical Engineering** (Professor from 2009, Associate Professor 2003-2009, Assistant Professor 1998-2003 ) and **Head of BioMedical Informatics Department** at Tarbiat **Modares** University, and President of Iranian Society of Biomedical Engineering (2007-2014). He has published over 321 papers in peer reviewed journals and international conferences.

He was Research Deputy Dean of Medical Sciences Faculty from 2009-2011, Manager of Applied Research office(1997-2005) and Head of Medical Physics Department (2008-2010) at Tarbiat Modares University. He has received many awards including the Razi second rank prize of "Invention, Innovation, Novation Group" from the Iranian National Research Center of Medical Sciences (NRCMS) for "design and implementation of isolated heart pacing, data logger and the signals analyzer system," in 2004. He has also received the awards of "Outstanding Iranian Student, Country-wide" in 1994 and "Outstanding Student of Tarbiat Modarres University" in 1993 and 1994. He has been the co-recipient of International Khwarizmi Award of "Outstanding Research Team" from the Iranian Research Organization for Science and Technology (IROST) for "Tehran Cybernetic Arm" project in 1990.

His research and teaching interests include theory and application of bio-electromagnetics, Human-Machine Interaction, bioelectric phenomena and electrophysiology, bio-instrumentation, and biological signal processing. He has worked in "Tehran Cybernetic Arm Group (Outstanding Research Team in Iran)" since 1987

He is concurrently working in three branches:

1. use of Electromagnetic fields/energy for treatment of cancer,
2. use of Bio-Electromagnetic fields/energy for empowering the mind (the Passive-Neuro-feedback Systems) and
3. development of the affective Human-Machine interfaces.

Recently, in one of His research scopes, he and his students are designing a human-machine interface in which the user can control a virtual/artificial arm/hand, wheelchair, Tele-ROBOT or any machines. As it is well-known, in traditional Human-Machine interfaces, the user should adapt her/himself to an applicable machine. In their opinion, one suffers from too much cognitive and mental stress during training or machine-tuning processes. But, in their plan/ongoing-research, the machine should try to detect user affective and affordances and adapt itself using bio-associated measures, whilst the user is using the machine. Thus, they will have a bi-direction human-machine interaction/co-operation. His hypothesis is that

during this interaction the cognitive pressure will be reduced and the user feels more satisfied. As a result, the system facilitates the learning process and shows higher control efficiency.

For the application of the above idea They want to decrease external force/load upon the system (Human+ Machine + Environment) by biological signals conveying information about the human's brain-state (cognition and their mental fatigue). Then, he would like to focus on the use of the forehead biopotentials signals for extracting the affective/attention/emotion and cognitive control and developing Human-Machine systems.