Mojtaba Khodadadi

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Research Interests

- Complex Systems
- Computational Social Science
- Stochastic Processes
- Online Social Media & Networks
- Application of Machine Learning in Data Analysis
- Econophysics

Education

2015 – 2016 **ICTP Postgraduate Diploma Programme in Physics**, *International Centre for Theoretical Physics (ICTP)*, Trieste, Italy.

2013 – 2015 **M.Sc. Condensed Matter Physics**, *Isfahan University of Technology (IUT)*, Isfahan, Iran.
- GPA: *19.15/20 (4.00/4.00)*.
- Supervisor: Dr. Farhad Shahbazi from Isfahan University of Technology & Prof. Mohammad Reza Rahimi Tabar from Sharif University of Technology and Oldenburg University.
- Master's thesis title: "Investigation of Epileptic Seizures by Analyzing EEG Data using Machine Learning". abstract

2009 – 2013 **B.Sc. Physics**, *Isfahan University of Technology (IUT)*, Isfahan, Iran.
- GPA: *17.54/20 (3.78/4.00)*, and Major GPA: *17.82/20 (3.85/4.00)*.

2005 – 2009 **Diploma Mathematics & Physics**, *Saadi High School & Adle Pre-University School*, Isfahan, Iran.
- Diploma GPA: *19.69/20 (4.00/4.00)*, and Pre-University GPA: *19.51/20 (4.00/4.00)*.

Honors and Awards

Computer-related:

2013 **Merit-Based Admission Offer**, to full-time Master Program in **Software Engineering** without Entrance exam, School of Computer Engineering, Iran University of Science and Technology, Tehran, Iran.

2010 **Honored as Outstanding Researcher Activity**, *SBM Project*, President of IUT, Isfahan, Iran.

2010 **Institute of Steel Employee Support & Retirement Fund Award**, *SBM Project*, Chairman & CEO, Tehran, Iran.

2009 **Ranked 2nd in 11th Iranian National Youth Kharazmi Award with the Statuette**, *for "Smart Bandwidth Manager (SBM)" Project*, Minister of Science, Research and Technology & Minister of Education, Iran.

Physics-related:

2010 & 2015 **Isfahan University of Technology Dean Award with the Statuette**, President of IUT, Isfahan, Iran.

2014 & 2015 **Ranked 1st, out of 58 Students**, *in all Programs of M.Sc. Physics according to GPA*, IUT, Isfahan, Iran.

2014 & 2015 **Ranked 1st, out of 34 M.Sc. Students**, *in Condensed Matter Physics Program according to GPA*, IUT.

2013 **Ranked 15th in 18th Iranian National Collegiate Scientific Olympiad**, among all B.Sc Physics Students of Nation, Iran.

2013 **Merit-Based Admission Offer**, to full-time Master Program in **Physics** without Entrance exam, IUT, Iran.

2013 **Ranked 4th, out of 61 in Undergraduate Physics program**, according to GPA, IUT, Isfahan, Iran.

2010 – 2015 **Selected as an Exceptional Talent in Physics Department**, IUT, Isfahan, Iran.

Fellowships & Grants

2015 – 2016 **ICTP Scholarship and Travel Grant**, International Centre for Theoretical Physics, Trieste, Italy.

2014 & 2015 **Iranian National Elites Foundation 2-year Graduate Fellowship**, Government of Iran.

2010 & 2015 **University Outstanding Student Scholarship**, Isfahan University of Technology, Isfahan, Iran.

2014 **Isfahan University of Technology Research Grant**, *for Master Thesis*, Isfahan, Iran.

2009 – 2013 **Iranian National Elites Foundation 4-year Undergraduate Fellowship**, Government of Iran.

2011 **Isfahan Science & Technology Town (ISTT) Research Grant**, *for "Electronic Content Management System (eCMS)" Project*, Association of Creativity Efflorescence, Isfahan, Iran.

2010 **Iranian National Elites Foundation Research Grant**, *for "Smart Bandwidth Manager (SBM)" Project*, Vice President for Science and Technology, Government of Iran.

Research Experience

2014 – 2015 **Graduate Researcher (Master's Thesis)**, *under supervison of Dr. F. Shahbazi and Prof. M.R.R. Tabar*, Physics department, Isfahan University of Technology and Sharif University of Technology, Iran. `abstract`.
Fields of research: EEG Data Analysis, Machine Learning, Stochastic Processes, Complex Systems.
- Identifying epilepsy seizures focus by correlation matrix and stochastic processes methods.
- Investigating the possibility of seizure prediction using hierarchical clustering of correlation matrices of different parts of brain over time.

2011 – 2013 **Researcher**, *Isfahan Science & Technology Town (ISTT)*, Isfahan, Iran.
I was member of *Association of Creativity Efflorescence* at ISTT.
- Implementing an Integrated *"Electronic Content Management System (eCMS)"*.
- Upgrade eLibrary to eCMS.

2007 – 2011 **Researcher**, *IT Center, Isfahan University of Technology*, Isfahan, Iran.
- Designing and Implementing *"Smart Bandwidth Manager (SBM)"* core.
- Developing, Testing and Debugging SBM v2.2.1 .

2010 **Researcher**, *Research Projects Office, Isfahan Science & Technology Town (ISTT)*, Isfahan, Iran.
- Developing, Testing and Debugging SBM v2.1.1 .

Computer Skills

Java 9 years experience,
- **Proficient** in Multithreaded Programming, Object Oriented Programming, Socket Programming, Network Programming, Web Scraping.
- **Proficient** with JSP, JSF, Hibernate, Swing, Spring framework, JUnit framework, Log4j, GWT, NIO, Java Sockets, JCF, RegEx, iText, JavaDJVU, PDFBox, J4L OCR, Servlets, Struts, JDBC.

Python 3 years experience,
- **Proficient** in Scientific Computing.
- **Proficient** with NumPy, Pandas, Matplotlib, Scikit-learn, SciPy, VPython, NetworkX, Graph-tool, Snap, BLZ, Blosc, Bcolz.

Database MYSQL, SQLite, HSQLDB, SciDB, OpenTSDB.

Software Gephi, Mathematica, Matlab, Maple.

IDE & Editor Netbeans, IPython, Spyder, IEP IDE, PyScripter, Ninja IDE, PyCharm, Wing IDE, Eclipse.

Other Familiar with PHP, Javascript, AJAX, C++, Fortran, LaTex, HTML, XML, CSS, SQL, Wordpress, Drupal.

Publications

Mojtaba Khodadadi, Farhad Shahbazi, **"Classification of Epilepsy Focus in Interictal and Ictal States"**, *accepted for 20-minute presentation at **CCS'15 (Conference On Complex Systems)***, Sep 26 - Oct 2, 2015 at Tempe, Arizona, USA.

Mojtaba Khodadadi, Farhad Shahbazi, Mohammad Reza Rahimi Tabar, **"PyMarkov: A Python Module for Markovian Stochastic Processes"**, *In preparation*.

Mojtaba Khodadadi, Farhad Shahbazi, Mohammad Reza Rahimi Tabar, **"PyCorrState: A Python Package for Correlation States Extraction"**, *In preparation*.

Mojtaba Khodadadi, Farhad Shahbazi, Mohammad Reza Rahimi Tabar, **"Identifying Epilepsy Focus by Correlation Matrix Method"**, *In preparation*.

Mojtaba Khodadadi, Farhad Shahbazi, Mohammad Reza Rahimi Tabar, **"Identifying States of an Epilepsy Seizure"**, *In preparation*.

Invited Lectures

Winter 2015 **Scientific Computing with Python: An Introduction to Data Analysis & High Performance Computing (16 hours)** for graduate students of Physics, *Department of Physics, Isfahan University of Technology*, Isfahan, Iran.   `more info, github`.

Winter 2014 **Python Short Course for Physics Students: An introduction to Scientific Computing (14 hours)** for graduate students of Physics, *Electronic and Open Learning Center, Isfahan University of Technology*, Isfahan, Iran.   `github`.

Summer 2010 **Java course: from Novice to Professional (50 hours)**, *Electronic and Open Learning Center, Isfahan University of Technology*, Isfahan, Iran.
At age 18, I was invited by *"Electronic and Open Learning Center"* to teach Java to senior and graduate students of Computer Science & Engineering. `more info`

Long Projects

National

2008 – 2010   **Smart Bandwidth Manager (SBM)**, *IT Center, Isfahan University of Technology*, Isfahan, Iran.

SBM is a dynamic network bandwidth management software that I and my friend have implemented at IT Center of IUT when we were highschool students. **SBM saves 48,000$ per year for Isfahan University of Technology**. **Awards:** 2nd, 3rd & 4th award in Honors & Awards section and the last grant in Fellowships & Grants section are related to this project. more info

Other

2011 – 2013   **Electronic Content Management System (eCMS)**, *Isfahan Science & Technology Town (ISTT)*, Isfahan, Iran.

eCMS is a research project which its main task is extracting metadata from ebook files and checking them with LoC website for validity. It also uses Tesseract OCR technology for scanned ebooks. **Awards:** 6th grant in Fellowships & Grants section is related to this project. more info

2007 – 2010   **Electronic Library (eLibrary)**, *IT Center, Isfahan University of Technology*, Isfahan, Iran.

eLibrary enables users to search in metadata and subject of ebooks. **eLibrary was sold to two universities each payed 8000$.** more info

Work Experience

Vocational

2007 – 2011   **Java Developer**, *IT Center, Isfahan University of Technology*, Isfahan, Iran.
- Designing, Implementing, Developing and Supporting an Electronic Library (eLibrary).
- Testing Smart Bandwidth Management (SBM) on the IUT internet network.

Teaching Experience

Teacher Assistant

Fall 2015   **Advanced Statistical Mechanics I (graduate course)**, *Instructor: Dr. J. Hashemifar*, Physics Dept., IUT.

Fall 2015   **Advanced Statistical Mechanics II (graduate course)**, *Instructor: Dr. F. Shahbazi*, Physics Dept., IUT.

Fall 2014   **Modern Physics**, *Instructor: Dr. F. Fazileh*, Physics Dept., IUT.

Professional Membership

2013 – Present   **Complex Systems Group**, Physics Dept., Isfahan University of Technology, Isfahan, Iran.

2009 – Present   **Iranian National Elites Foundation (BMN)**, Government of Iran.

2011 – 2013   **Isfahan Science & Technology Town (ISTT)**, *Association of Creativity Efflorescence*, Isfahan, Iran.

Non-Academic Courses

Summer 2012   **Introduction to Market Research and Marketing**, Isfahan Science & Technology Town (ISTT), Isfahan.

Fall 2011   **Ideas and Opportunities**, Isfahan Science & Technology Town (ISTT), Isfahan, Iran.

Summer 2011   **Entrepreneurship**, SITCO International, NIIT Isfahan Center, Iranian National Elites Foundation (BMN).

April 2010   **Security & Hack**, Ashiyaneh Security Corporation, Tehran, Iran.

Participation in Conferences

Summer 2014   **4th Iranian Workshop on Computational Neuroscience**, Physics Dept., Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran.

Winter 2013   **18th Special School of Physics**, Physics Dept., Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran.

Fall 2013   **2nd IPM Conference on Soft Matter, Biological and Statistical Physics**, School of Physics, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran.

Fall 2013   **Workshop on Physics of Polymers and Biopolymers**, School of Physics, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran.

Conference Organization

January 2015   **12th Iran National Conference on Condensed Matter Physics**, *Member of Organization Committee*, Isfahan University of Technology, Isfahan, Iran.

September 2014   **International Iran Conferences on Quantum Information 2014 (IICQI)**, *Member of Local Coordinating Committee*, Sharif University of Technology and Isfahan University of Technology, Isfahan, Iran.
Web site: http://iicqi.sharif.edu/events/iicqi-14