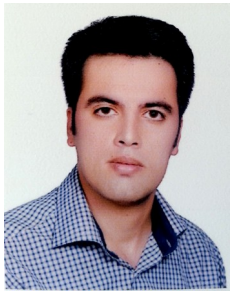
CURRICULUM VITAE



PERSONAL DETAILS:

Name: Abolfazl Ahmadi Rahmat

Field: Statistical Mechanics and Complex Systems Physics

Birth: January 27, 1993

Address: Hamadan, Iran

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EDUCATIONS:

M.Sc. in Solid State Physics (Complex Systems Physics) 2015-2018
Shiaraz University, Shiraz, Iran

B.Sc. in Solid State Physics 2011-2015
Bu-Ali Sina University, Hamadan, Iran

POSTGRADUATE RESEARCH EXPERIENCE:

Part-Time (free and self employed) Researcher at Center for Theoretical Neuroscience at IPM, Tehran, (structural effects and causes of Alzheimer's disease, schizophrenia and Parkinson's disease, a complex system approach (dynamical complex network and phase transition)) (Agu 2018 – Nov 2018).

Full-Time Researcher at Brain Engineering Research Center at IPM, Tehran (Jul 2018 – Agu 2018).

AREA OF RESEARCH:

Statistical Mechanics (Complex Systems and Nonlinear Dynamics), Soft Matter Physics, Biophysics, Pattern Formation, Phase Transition, Computational Neuroscience.

In M.Sc. I worked on criticality and phase transition in brain and complex systems

(with complex network approach), theoretical and simulations.

TECHNICAL SKILLS:

OOP(Object-oriented programming)

PROGRAMMING LANGUAGES:

C++/C, Python, Java, Basic, Shell Scripting

Main programming language:C++

IDE:

QT, Gedit, Nano, Vim

OS:

Main OS: Linux(Ubuntu, Debian, CentOS).

Others: Microsoft Windows

TECHNICAL SOFTWARES:

Wolfram Mathematica, GNU Octave, (In most cases, I use my own codes or open source codes)

Github: https://github.com/ahmadiphy

DISTINCTIONS

Free Education in M.Sc. as Exceptional Talented Student in Shiraz University (2015)

Exceptional Talented Student in Bu-Ali Sina University (2013).

Graduated in Public Exemplary High Schools 2007-2011 (2007-2011).

National Youth Khwarizmi Award - for high school students - Provincial rank 1 - Magnetic Muscle Invention (2009).

National Youth Khwarizmi Award - for high school students - Provincial rank 2 - an article on Newton's Third Law of Motion and Efficient Drill Design Based on That (2008).

Accepted in First Stage of National Student Mathematical Olympiad (2008).

PUBLICATIONS:

Abolfazl Ahmadi-Rahmat, Mohammad Hossein Tavakoli, "A new bicycle shifting mechanism", *The Annual Physics Conference of Iran 2013*, **(2013) 2422-2425.**

Ahmad Mehrabi, Abolfazl Ahmadi-Rahmat, “Information gains from Monte Carlo Markov Chains”, arXiv:1904.11920

PRESENTATIONS:

Pruning of infective edges in a complete network leads to a scale-free structure, poster presentation at Brain Engineering & Computational Neuroscience Conference (IPM, Tehran, Iran, Jan 31- Feb 2, 2018)

A new bicycle shifting mechanism, poster presentation at Annual Physics Conferences of Iran (Birjand University, Birjand, Iran, September, 2013)

CONFERENCES & SCHOOLS & WORKSHOPS:

Brain Engineering & Computational Neuroscience Conference (IPM, Tehran, Iran, Jan 31- Feb 2, 2018)

9th Conference on Statistical Physics, Soft Condensed Matter and Complex Systems of Iran (Shiraz University, Shiraz, Iran, January, 2017)

School of Neuroscience (Shiraz University, Shiraz, Iran, December, 2016)

School of The Usage of Symmetry Groups in Physics (Bu-Ali Sina University, Hamadan, Iran, April, 2015)

Mini-workshop of C*-algebras (Bu-Ali Sina University, Hamadan, Iran, January, 2015)

Annual Physics Conferences of Iran (Birjand University, Birjand, Iran, September, 2013)

TEACHING/ADMINISTRATION EXPERIENCE:

Lecturer of Python Programming Language (Bu Ali Sina University, Spring-2019)

TA of Mathematical Methods for Physicists (Bu-Ali Sina University, Spring-2019)

TA of Electromagnetic Theory (Bu-Ali Sina University, Spring-2019)

Lecturer of Computational Physics (Bu-Ali Sina University, Fall-2018)

TA of Fundamental Physics 1 (Shiraz University, Fall-2016)

PROFESSIONAL MEMBERSHIPS:

Physics Society of the Bu-Ali Sina University (2012-2015)

Executive Member of the Astronomical Society of the Bu-Ali Sina University (2013-2014 academic year)

HOBBIES & INTERESTS

Classical Music: Bach, Beethoven, Tartini, Albinoni, Vivaldi, Mozart, ... (Baroque music).

Reading: Albert Camus, Jean-Paul Sartre, Franz Kafka, Sadegh Hedayat

Playing Violin

Musical Composition

Programming and Simulating

Painting

Geometry and Number Theory

M.Sc. Thesis Abstract:

"Spreading Models with Critical Dynamics on Hierarchical Modular Networks: Neuroscience Implications."

In this thesis, the dynamics of neurons is simulated using SIS and SIRS epidemic spreading models. By running the SIS model dynamics on hierarchical modular networks, as a real network of the brain, there is a region in system behavior that in this region the system has critical properties. The existence of a critical region justifies the hypothesis of the criticality of the brain, despite the infinity of the critical point. By running the SIRS model dynamics on the same network and the presence of the neuronal refractory period, the critical region increases. Also, the placement of the time-out mode of these spreading models with edge pruning (synaptic pruning according to the Heb rule in the neural networks) in the complete network, a kind of criticality in the structure with the emerge of the Scale-Free network is observed in

this process, which is a new justification for the formation of Scale-Free networks; in the form of a self-organize criticality in the brain, nature and social networks with a different view from the previous models.