Mohammad Sherafati

Curriculum Vitae

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Education

2017-2019 **Master of Complex and Biological systems**, *Center for Complex Network and Social Data Science (CCNSD), Shahid Beheshti University*, Tehran, Iran, GPA: 17.2/20 (3.65/4.0).
Thesis: The effect of relationship lifetime on balance formation in social structure.
Supervisor: Prof. Gholamreza Jafari

2012-2017 **Bachelor of Physics**, *Sharif University of Technology*, Tehran, Iran, GPA (for last two years): 16.71/20 (3.43/4.0) via 69 credits..

2011-2012 **Diploma**, *Shahid Beheshti (National Organisation for Developing Exceptional Talents)*, Tehran, Iran, GPA: 18.5/20 (4.0/4.0).

Selected courses

- Critical phenomena 4.0/4.0
- Stochastic Processes 3.0/4.0
- Complex-systems 4.0/4.0
- Unbalanced statistical physics 4.0/4.0
- Computational physics 4.0/4.0
- Advanced statistical physics 4.0/4.0

Reaserch Interests

- Statistical Physics, Stochastic Processes and Chaos
- Data Science and Machine Learning
- Complex-systems and Network science
- Econophysics and Neuroscience
- Time series and Temporal network

Publications

- S. Arabzadeh, M. Sherafati, F. Atyabi, G. Jafari, K. Kułakowski, **Critical lifetime phenomena in evolving social balance dynamics**, (2020), Physica A, doi: 10.1016/j.physa.2020.125689.
- A. Hosseiny, M. Sherafati, M. Absalan, M. Gallegati, **Hysteresis of economic networks in an XY model**, (2018), Physica A, doi: 10.1016/j.physa.2018.08.064 .

Research Activities and Work Experience

Jun 2022 - current **Senior Data Analyst, Trust**, *Divar* ⇑ .
- Developed an algorithm to identify fraud and block fraudsters.
- Determined the health metrics to be observed over time.
- Analyzed fraudster behavior to establish fraud detection algorithms.

Dec 2020 - Jun 2022	**Data Scientist**, *Hesaba* ⇑ .
	○ Used Jaccard index algorithm, Annoy, Faiss and MinHash to find similar user trajectory in CDR big data.
	○ Provided comprehensive analysis and recommend solutions to address complex problem in CDR data.
	○ Developed data-gathering, cleaning and reporting structures from ground up.
	○ Setup and maintains graph database such as JanusGraph, Nebula, Dgraph to comparison between them.
	○ Developed django back-end structure for CDR data.
Feb 2020 - Sep 2020	**Developed a visualized dashboard for clients to analyze the behavior of their customers and distinguish between them**, *Rooberah co* ⇑.
	○ Cleaning and preparing data for analysis
	○ Creating a report from the data for clients
	○ Training a machine to suggest new items to customers based on their purchase history(Recommender system)
Jul - 2019 Sep - 2019	**Developed an architecture of Deep Neural Network for sound classification with 41 labels**, *Supervisor: Dr.Alireza Vafaei Sadr, Post-Doc in Department of Physics, IPM (Institue for research in Fundamental Sciences)*.
	○ Input data: Kaggle competition (freesound audio tagging ⇑).
	○ Trained a convolution neural network with 83% accuracy.
	○ Trained an XGboost structure with 73% accuracy
2018 - 2019	**Developed an article tagger of Arxiv papers by supervised machine learning in Python (Packages: NLTK - Scikitlearn - TensorFlow)**, *Supervisor: Prof. Sadegh Raeisi, Faculty of Department of Physics, Sharif University of technology*.
	○ Input data: Arxiv physics papers from 2007 to 2017 ⇑.
	○ A model developed to predict the category of paper using their abstract.
2018 - 2019	**Internship in SANA Company as a data analysis (Data Science and Analytics Company)**, *Supervisor: Dr.Amir Hesam Salavati, Head of Data science of SADA Company*.
	○ SANA ⇑ cooperates with two large companies in Iran: Ubaar⇑ and Achare⇑.
	○ My goal was to predict the price of goods based on their features.
May - 2018 Sep - 2018	**Finding brain network patters of patients with epilepsy seizures**, *Supervisor: Prof. Marzieh Zare, Faculty of Department of Computer Science, Institute for Research in Fundamental Sciences (IPM)*.
	○ Research is based on a large EEG dataset from 22 patients.
	○ I showed that in most of the patients, seizures could be predicted based on the changes in the complexity of brain.

Schools and Workshops

2019	**Spring College on the Physics of Complex Systems**, ICTP, Trieste, Italy.
2019	**IPM Data Science Weekly Workshop**, IPM, Tehran, Iran.
2018	**Tehran school on Theory and Applications of Complex Networks**, Shahid Beheshti University.

Online courses

2020	**Matrix Methods in Data Analysis, Signal Processing, and Machine Learning**, *Prof. Gilbert Strang*, MIT Open Course.
2019	**Complete Guide to TensorFlow for Deep Learning with Python**, Udemy.
2019	**Mathematics for Machine Learning: Linear Algebra**, Coursera.

2018	**Python for Data Science and Machine Learning Bootcamp**, Udemy.
2017	**Intro to Python for Data Science, Intermediate Python for Data Science, Python Data Science Toolbox**, *Grade: 100/100*, Datacamp.com.
2017	**Statistical Mechanics: Algorithms and Computations**, *Course from coursera*, by École Normale Supérieure.

Scientific Services

2015	**Holding conference on Econophysics**, *Sharif University of Technology, Tehran, Iran*.
2015	**Co-organizer of Tea and Physics sessions**, *A series of weekly meetings of students and professors to analyze daily physics phenomena while enjoying a cup of tea!*.
2013	**Co-founder of Association of Zharfa with a group of students (zharfa90.ir)**, *A foundation between physics, Mathematics and Philosophy of science*, Sharif University of Technology, Tehran, Iran.

Teaching Experience

| 2014 - 2019 | **Mathematics and Physics teacher at high schools**. |
| 2013 - 2017 | **Teacher of Mathematics and Physics Olympiad in high schools**. |

Skills

Programming Languages	Python (Advanced), Spark(Advanced), R(intermediate), Scala(intermediate), SQL (intermediate), BigData Tools(Hbase, Hadoob, ClickHouse)
Other Software	Matlab (Elementary), Latex (intermediate), Git (intermediate)
Languages	English (Professional), Arabic (Intermediate), Persian (Native)
Other skill	Scuba Diving (certificated SSI (Scuba Schools International))
BigData	Hbase(intermediate), Hadoop(intermediate), clickhouse(intermediate), JanusGraph(Advanced), Nebula(Advanced)

Interests and Hobbies

- Read literature, Poem and scientific books
- Theater, cinema, and movie
- Climbing and soccer

References

Dr. Gholamreza Jafari, Professor   gjafari@gmail.com
Department of Physics
Shahid Beheshti University

Dr. Ali Hoseini, Assistant professor   alihd22@gmail.com
Department of Physics
Shahid Beheshti University

Dr. Seyed Sadegh Movahed, Associate professor   s.movahed@sbu.ac.ir
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