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Alireza Jafari

jrp5td@virginia.edu
alireza109977@gmail.com
(202) 815 3103

Google scholar
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RESEARCH INTERESTS

Computer Science, Artificial Intelligence, Machine Learning, Foundation Models, Graph neural networks, Data mining, Time series prediction, Stock prediction, Text mining.

EDUCATION

Ph.D. of Computer Science
University of Virginia, VA, United States, August 2023.
Graduate Research Assistant
Supervisor: Professor Geoffrey C. Fox
Qualification exam title: "Foundation Models for Time Series Forecasting"

Master of Computer Science (Network science)
University of Tehran, Tehran, Iran, GPA 3.81, September 2019 - January 2023.
Thesis title: "Financial markets prediction using network-based analysis and modeling"
Supervisor: Professor Saman Haratizadeh

Bachelor of Computer Engineering
Islamic Azad University, Tehran, Iran, GPA 3.38, September 2015 - September 2019.

RESEARCH EXPERIENCE & TEACHING ASSISTANT

Knowledge discovery and data mining lab, University of Tehran

- Stock price prediction by graph neural networks
- Graph modeling of Stock market
- Directional graph Attention networks
- Graph-based recommender systems
- Assistant Professor Z. Heshmati, conduct research on places with a high probability of emitting COVID-19, a graph-based method
- Teaching assistant to Professor S. Haratizadeh in the course on Machine learning (2019 & 2020)
- Teaching assistant to Professor S. Haratizadeh in the course on Big Data (2020)

Department of Computer Science, Islamic Azad University

- Teaching assistant to Professor H. Erfani in the course on Programming Language (Python, 2019)
- Teaching assistant to Professor J. Shah Parian in the course on Data Structures (2018)

PUBLICATIONS

1. Jafari, A., & Haratizadeh, S. (2020). Using a hybrid model of supervised learning and label propagation for prediction of stock price direction of movement. 26th International Computer Conference Computer Society of Iran. (in Farsi)
2. Jafari, A., & Haratizadeh, S. (2022). GCNET: graph-based prediction of stock price movement using graph convolutional network. Engineering Applications of Artificial Intelligence, Volume 116, November 2022, 105452. https://doi.org/10.1016/j.engappai.2022.105452
3. Jafari, A., & Haratizadeh, S. (2023). Stock price movement prediction using Directed Graph Attention Network. Iranian journal of Electrical and Computer engineering (IJECE), Volume 21, Spring 2023, 36319. (in Farsi)
4. Jafari, A., & Haratizadeh, S. (2023). NETpred: Network-based stock market index prediction using clustering and graph neural network. Elsevier - Decision Support Systems, (under review). Preprint: arXiv:2212.05916v1, https://doi.org/10.48550/arXiv.2212.05916.
5. Jafari, A., Fox, G., Rundle, J. B., Donnellan, A., & Ludwig, L. G. (2024). Time Series Foundation Models and Deep Learning Architectures for Earthquake Temporal and Spatial Nowcasting. *arXiv preprint arXiv:2408.11990* (under review).
6. Shariatmadari, A., Jafari, A., Guo, S., Srinivasan, S., Jha, K., & Zhang, A. (2025). ConceptDrift: Leveraging Spatial, Temporal and Semantic Evolution of Biomedical Concepts for Hypothesis Generation. (under review).

CONFERENCE PRESENTATIONS

1. "Network-based deep learning models for stock price prediction", 26th International Computer Conference Computer Society of Iran, Tehran, 2020. (Presented by A. Jafari)
2. "Foundation and Pattern Models for Earthquake Nowcasting", poster presentation at the Moderate FAIR & AI Models Session, FARR Workshop, Washington D.C., October 2024. (Presented by G. Fox)
3. "Advancing Foundation Models in Earthquake Nowcasting", The International Conference for High Performance Computing, Networking, Storage, and Analysis, Atlanta, GA, November 2024. (Presented by G. Fox)
4. “Integrating LLMs and Time Series Foundation Models for Earthquakes and Hydrology”, UVA LLM Workshop 2024, Charlottesville, VA, October 2024. (Presented by A. Jafari)

VOLUNTARY ACTIVITIES

Member of the Board of Directors of the Scientific Association of Computer Science, Tehran Azad University, 2017 - 2019.

Invited reviewer in the journal of Expert system and application, Elsevier, for topics of machine learning, graph analysis, and stock prediction, May 2022 until now.

Invited reviewer in the 2nd International Conference on Optoelectronic Information and Computer Engineering, Hangzhou, China, May 2023.

Invited reviewer in the Publishing platform of Qeios, for topics of machine learning, graph analysis, and stock prediction, November 2023 until now.

HONORS / AWARDS

Top rank in the national entrance examination in Master's degree, 2019.
Acquisition of excellent student degree in Tehran Azad University, 2019.
The talk got the Audience's Choice Award in UVA LLM Workshop 2024, 2024.

TECHNICAL SKILLS

Programming languages and mathematical packages: Python, Matlab, Java, Sklearn, Tensorflow, Keras.

LANGUAGES

English: Fluent
Persian: Native