

# Alireza Hashemi

[ahashemi@ccny.cuny.edu](mailto:ahashemi@ccny.cuny.edu) | [ialireza13.github.io](https://ialireza13.github.io) | +1 781 658 8621

## EDUCATION

- The City University of New York** - PhD in Physics Sep 2022 – Fall 2026
- Applied graph machine learning and graph deep learning on biological data. Application of symmetries and fibrations in studying graph-based problems. (Python: [Github](#))
- Sharif University of Technology** - Master of Science in Physics Sep 2019 – Jan 2022
- Numerical simulation of chaos in systems of many topological defects. (Python: [Github](#))
  - Simulation of social distancing in pedestrian dynamics. (Python: [Github](#))
- University of Zanjan** - Bachelor of Science in Physics Sep 2015 – Jun 2019
- Radiative heat transfer in many-body fractal nano-structures (computational linear algebra). (C++, OpenMP, CUDA)
  - Ground-state energy eigenvalues for fractal quantum potentials. (C++: [Github](#))

## WORK EXPERIENCE

### blubank, Iran

- Data Scientist (Founding Member of the Data Science Team) May 2020 – Aug 2022
- Fraud detection on user transactional data using isolation forests, autoencoders, and other anomaly detection methods.
  - Fine-tuning and training of several CNNs for face & ID card verification and liveness detection.
  - Development of a Neo4j graph database and graph machine learning solutions on various internal data sources to identify money-laundry networks, community detection, fraud detection, and recommender system in a user transaction database with >2 million users.
  - Data engineering pipelines & automations with Apache Airflow and ETL with Python on different databases (SQL, NoSQL).
  - High-level presentations of results and solutions to business and marketing teams.

### Rahnema College, Iran

- Machine Learning Course Mentor (Volunteer work) Mar 2021 – Jun 2021
- Machine Learning Intern Jan 2020 – Mar 2020
- Three-month internship on theory and applications of machine learning, gained experience with big data tools such as Spark & Hadoop. Worked on a music recommender system project for an Iranian music streaming website (beeptunes).

## PUBLICATIONS & CONFERENCES

- [Visiting distant neighbors in graph convolutional networks](#) - *arxiv preprint* (2023)
- [Social distancing in pedestrian dynamics and its effect of disease spreading](#) - *Physical Review E* (2021)
- [Chaotic dynamics of active topological defects](#) - *Soft Materials* (2021)
- [Analysis of the ground-state energy eigenvalues of fractal quantum potentials](#) - *Physica Scripta* (2019)
- [Many-body effects on the radiative heat transfer in fractal nanostructures](#) - *IJAA* (2017)
- [Social distancing in pedestrian dynamics](#) - *Dynamical Biological Systems* (2020)
- [COVID-19 in Iran](#) - *NetSci* (2020)
- [Effectiveness of social distancing through the lens of Agent-Based Modelling](#) - *Complex Systems Society* (2020)

## RELEVANT SKILLS

Python, C++, MATLAB, R, **Standard Machine Learning Libraries**, **Network Science Libraries**: NetworkX, graph-tool, **Deep Learning**: Keras, TensorFlow, PyTorch (PyTorch geometric), **Parallel Computation**: LAPACK, OpenMP, CUDA, **SQL**, **Databases**: PostgreSQL, MongoDB, Neo4j, **Timeseries**: Causal impact analysis, anomaly & fraud detection, **Data Reporting**: Metabase, Superset, **Data Engineering & ML Automation Tools**: Apache Airflow, Python ETL

## OTHER

[NTD Hackathon](#) runner-up team (report on [NPR.org](#)), Teaching experience as an adjunct lecturer at CCNY, Translation of the book "Dark Matter & Dark Energy" by Brian Clegg to Farsi (2020). Student representative in Doctoral & Graduate Student Council at CUNY. Dynamical Biological Systems 2020 award for best visualization.

## RELEVANT COURSEWORK

Deep Learning (*with Y. LeCun*), Stochastic Optimization, Numerical Methods in Physics, Statistical Machine Learning

## LINKS

[Google Scholar](#)

[Researchgate](#)

[Linkedin](#)

[Github](#)