Aslan Seifi

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Education

Northwestern University **Sep. 2019 – Jun. 2025 (expected)**
Ph.D. in Theoretical Particle Physics, GPA: 3.96/4.00 Evanston, IL
Kellogg School of Management, Northwestern University **Jun. 2024 – Aug. 2024**
Management for PhDs Summer Program (Selected as a top 50 student in STEM) Evanston, IL
Sharif University of Technology **Sep. 2016 – Jun. 2018**
Master's in Theoretical Particle Physics, GPA: 4.00/4.00 Tehran, Iran
University of Tehran **Sep. 2012 – Jun. 2016**
Bachelor's in Physics, GPA: 3.90/4.00 Tehran, Iran

Technical Skills

Programming Languages: Python, R, Mathematica, Matlab, C++

Libraries/Frameworks: NumPy, Pandas, TensorFlow, PyTorch, xAct, FeynCalc

Tools: Microsoft Office, LaTeX, VMD

Data Analysis Techniques: Statistical Methods, Machine Learning, Deep Learning, Time Series Analysis, Stochastic Calculus, Data Structures and Algorithms

Finance and Data Science Experience

Stock Market Analysis **Spring 2024**
- Applied linear and nonlinear time series models (ARMA, TAR) and deep learning models to stock markets to forecast price movements and identify trading opportunities.
- Analyzed daily stock market prices from 2000 to 2018 for 24 markets, identifying the best-fitting model for each stock and achieving a 10% reduction in RMS error.
- Utilized Python and R for data analysis, model fitting, and visualization, contributing to more accurate financial predictions and risk assessments.

Astrophysics Data Analysis **Fall 2023**
- Fitted linear and nonlinear models to find the relation between mass and velocity of about 60 stars using maximum likelihood methods and MCMC, providing insights into stellar dynamics.
- Utilized Python libraries such as NumPy, Pandas, and SciPy for data manipulation and analysis.

Neural Network Design **Spring 2024 – Present**
- Designed neural networks to identify hidden symmetries in particle physics, contributing to advancements in applying machine learning in theoretical physics.
- Applied TensorFlow and PyTorch frameworks for building and training neural networks. (Big dataset, about 1M)

Management for PhDs Summer Program **Summer 2024**
- Developed a comprehensive understanding of industry and business topics, including economics, finance, entrepreneurship, operations management, risk and uncertainty, accounting, and leadership skills, positioning myself for leadership roles in industry.

Research and Teaching Experience

Northwestern University **2019 – Present**
- Doctoral Researcher in Amplitude and Insight Group
- Developed mathematical models for physical observables using modern physics ideas, applied advanced functional programming in Mathematica for analysis.
- Teaching Assistant for three graduate and three introductory courses. Led discussion sections and designed new problem sets to facilitate student learning through interactive discussions.

Sharif University of Technology **2016 – 2018**
- Master Student Researcher
- Applied novel physics calculation techniques to validate some quantum gravity calculations.
- Led office hours and discussion sections for math and physics courses. Conducted weekly journal clubs.

University of Tehran **2012 – 2016**
- Bachelor Student Researcher
- Demonstrated quantum locking in high-temperature superconductors and programmed molecular motion simulations using C++ and VMD.

Selected Publications and Talks

Publications:

- **Loop-level double-copy for massive fermions in the fundamental**, arXiv:[2302.14861], J.J.M. Carrasco, A. Seifi (Published in JHEP, 50 pages) (2023)
- **Physics-Aware Neural Networks**, A. Seifi (In preparation)

Talks:

- **Modern Approaches to Scattering Amplitudes**, Rapid Fire Research (2021)
- **Effective Field Theories and Scattering Amplitudes**, Presented research to freshmen physics students (2022)

Leadership Experience

Physics Department, Northwestern University **Sep. 2022 – Jun. 2023**

• *Social Events Chair*

- Arranged gatherings and social activities for graduate students.
- Increased student engagement by 30% through innovative event planning.

Iranian Community Association, Northwestern University **Sep. 2022 – Jun. 2023**

• *Treasurer*

- Organized events to support human rights in Middle Eastern countries.
- Managed a budget of $5,000 with transparency and accountability.

Honors

Northwestern University **2019 – 2020**

- Recipient of the Northwestern University Fellowship to pursue doctoral studies.

Sharif University of Technology **June 2016**

- Ranked 13th among more than 13,000 participants in nationwide qualification exam for entering grad schools (**top 0.1%**)

University of Tehran **June 2012**

- Ranked 226th among more than 360,000 participants in nationwide qualification exam for entering colleges (**top 0.06%**)
- Ranked 84th among more than 100,000 participants in educationally underprivileged regions in Nationwide qualification exam for entering colleges (**top 0. 08%**)

Hobbies

Salsa: Enjoy participating in social dancing events.

Soccer: Participate in tournament events.

Reading: Interested in autobiographies and historical novels.

Hiking: Enjoy exploring scenic areas through hiking.