Hamed Vaheb

Isfahan, Iran | 20 September 1995
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Research Interests

Data Science, Machine Learning, Deep Learning, Neural Networks, Time Series Forecasting, Time Series Analysis, Social Network Analysis, Natural Language Processing

Education

M.S., Financial Mathematics July 2020
Amirkabir University of Technology (AUT) Tehran, Iran
Thesis: "Asset Price Forecasting using Recurrent Neural Networks"
Advisor: Asst. Prof. Erfan Salavati
GPA: 18.41/20 (4.0/4.0), Class Rank: 2

B.S., Mathematics and its Applications June 2017
Isfahan University of Technology (IUT) Isfahan, Iran
Thesis: "On Decomposing Systems of Polynomial Equations with Finitely Many Solutions"
Advisor: Assoc. Prof. Amir Hashemi
GPA: 16.38/20 (3.38/4.0), Class Rank: 4

Skills

Programming	Proficient:	`Python`, `C`, `R`, LaTeX
	Basic:	`SQL`, `HTML`, `CSS`, `JavaScript`, `Lisp`
Software	IDEs:	`Pycharm`, `Spyder`, `RStudio`
	Tools:	`Maple`, `Matlab`, `Gams`, `Git`, `Docker`, `Gimp`
	Platforms:	`Linux` and `UNIX`
	Libraries:	`Scipy`, `Numpy`, `Pandas`, `Stats`, `Matplotlib`, `Plotly`, `Scikit-learn`, `Keras`

Certificates

- Guided Tour of Machine Learning in Finance, New York University - Coursera — November 2018
- Introduction to Philosophy, University of Edinburgh - Coursera — December 2018
- Fundamentals of Machine Learning in Finance, New York University - Coursera — January 2020
- Social Psychology, Wesleyan University - Coursera — September 2020
- Introduction to Data Science in Python, University of Michigan - Coursera — November 2020
- Applied Plotting, Charting & Data Representation in Python, University of Michigan — January 2021
- Computer Science for Artificial Intelligence Professional Certificate, Harvard University - edX
  - CS50's Introduction to Computer Science — Ongoing
  - CS50's Introduction to Artificial Intelligence with Python — Ongoing
- Applied Machine Learning in Python, Michigan University - Coursera — Ongoing

Academic Projects

BACHELOR

Bachelor of Science Thesis 2016-2017
Title: "On Decomposing Systems of Polynomial Equations with Finitely Many Solutions"
Professor: Amir Hashemi
- Elaborated and implemented Möller's algorithm to solve a system of polynomial equations

MASTER

Master of Science Thesis 2018-2020
Title: "Asset Price Forecasting using Recurrent Neural Networks"
Professor: Erfan Salavati
- Forecast, analyzed, and visualized two S&P stocks using LSTM and ARIMA
- Elaborated on the framework on which neural networks are based by proving theorems

Special Topics in Financial Mathematics 2018
Professor: Farnaz Hooshmand Khaligh
- Solved financial resource allocation and optimization problems, e.g., Markovitz in `Gams`

COURSERA

Machine Learning in Finance
Courses: Guided Tour of Machine Learning in Finance
Fundamentals of Machine Learning in Finance

1. **Euclidean Distance** 2018
   - Computed, analyzed, and visualized Euclidean distance between sampled points
2. **Regression** 2018
   - Applied linear and Tobit regression, visualized the latter, and reported loss
3. **Bank Failure** 2018
   - Modeled and predicted bank failures based on *CAMELS*, using logit and random forest
4. **Unsupervised Learning** 2018
   - Constructed Eigen-portfolio using PCA and developed simple trading strategy
   - Visualized multi-dimensional data using t-SNE

Applied Data Science with Python
Courses: Introduction to Data Science in Python
Applied Plotting, Charting & Data Representation in Python

1. **RegEx** 2020
   - Extracted information from a text dataset, based on emerging patterns in strings
2. **Pandas and Stats** 2020
   - Provided analysis, statistical testing, and summary of real-world datasets, e.g., CDC immunizations and vaccines, major sport leagues, and countries' energy indicators
3. **Matplotlib** 2021
   - Evaluated visualizations using Alberto Cairo and Edward Tufte's theories and principles
   - Visualized datasets and exhibited meaningful patterns through representations

EDX

Computer Science
Course: CS50's Introduction to Computer Science

1. **C:** Luhn Algorithm Scrabble Readability Caesar's Cipher Runoff Election 2021
   WAV Volume Image Filter Recover JPEGs Inheritence Spell-checker
2. **SQL** Ongoing
   - Data processing, working with databases
3. **HTML** Ongoing
   - Web development using HTML, CSS, and JavaScript

Languages

- **English:** Fluent **TOEFL** Score: 112 (**R**: 29, **L**: 27, **S**: 28, **W**: 28)
- **Persian:** Native **German:** Beginner **Japanese:** Beginner

Teaching Experience

Teaching Assistant of Stochastic Processes (Graduate Course) Spring 2018
Professor: Erfan Salavati (Amirkabir University of Technology)

- Functioned as a liaison between the professor and students by providing weekly handouts, additional contents and sessions that enhanced exam preparedness
- Resolved problems encountered by students both inside and outside of class
- Implemented and presented some of the course's methods and algorithms in `Matlab`

Awards and Honors

- Ranked within top ***3%*** among 5000 participants in Iranian University Entrance Exam for graduate school
- Received national undergraduate and graduate full scholarships

References

- **Dr. Erfan Salavati**
  Assistant Professor of Mathematics Telephone: +98 21 645 456 61
  Department of Mathematics and Computer Science Email: `erfan.salavati@aut.ac.ir`
  Amirkabir University of Technology
  No. 350, Hafez Ave, Valiasr Square, Tehran, Iran 1591634311
- **Dr. Amir Hashemi**
  Associate Professor of Mathematics Telephone: +98 313 391 36 35
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  Isfahan University of Technology
  Khomeyni Shahr Isfahan, Iran