

# Amir Masoud Sefidian

MACHINE LEARNING ENGINEER

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## Education

### M.Sc. in Computer Engineering

2015–2017

SHAHID RAJAEI UNIVERSITY · GPA: 4.0/4.0 (19.34/20) · RANKED 1<sup>st</sup> AMONG ALL M.Sc. STUDENTS.

Tehran, Iran

- Thesis: “Improving missing value estimation and inconsistencies detection using data partitioning techniques” (Grade: Excellent), Supervisor: Dr. Negin Daneshpour.
- **Research Interests:** Data Science, Machine Learning, Deep Learning, Reinforcement Learning, Computer Vision.

### B.Sc. in Computer Engineering

2011–2015

SHAHID RAJAEI UNIVERSITY · GPA: 3.96/4.0 (19.15/20) · RANKED 1<sup>st</sup> AMONG ALL B.Sc. STUDENTS.

Tehran, Iran

- Thesis: “Designing an online consultation system” (Grade: 20/20), Supervisor: Dr. Hamid Reza Shayegh.

## Publications

- 2020** Sefidian, Amir Masoud, and Daneshpour, Negin (2020). “Estimating missing data using novel correlation maximization based methods”. *Applied Soft Computing*, 91, 106249.
- 2019** Sefidian, Amir Masoud, and Daneshpour, Negin (2019). “Missing value imputation using a novel grey based fuzzy c-means, mutual information based feature selection, and regression model”. *Expert Systems with Applications*, 115, 68-94.
- 2018** Sefidian, Amir Masoud, and Daneshpour, Negin (2018). “Applying regression models on subsets with high correlations for a better numeric missing values imputation”. *Tabriz Journal of Electrical Engineering*, 48(3), 1187-1200 (in Persian).
- 2017** Sefidian, Amir Masoud, and Daneshpour, Negin (2017). “Using clustering and a hybrid method to fill the numeric missing values”. *Iranian Journal of Electrical and Computer Engineering (IJECE)*, 15(3), 233-242 (in Persian).

## Academic Experience

### Researcher

2015–2020

COMPUTER SCIENCE R&D LABORATORY, FACULTY OF COMPUTER ENGINEERING, SHAHID RAJAEI UNIVERSITY

- Conducted research in the field of data preprocessing, especially the missing values imputation problem, using machine learning techniques
- Proposed and developed three novel missing value imputation approaches

### Teaching Assistant

2016–2018

FACULTY OF COMPUTER ENGINEERING, SHAHID RAJAEI UNIVERSITY

- “Database” (Undergraduate) · “Data Mining” and “Decision Support Systems” (Graduate) · Instructor: Dr. Negin Daneshpour.

### Reviewer

- International Journal of Uncertainty, Fuzziness, and Knowledge-Based Systems (IJUFKS)
- International Journal of Information Technology, and Decision Making (IJITDM)

## Skills

### Programming Languages

- Proficient in **PYTHON**:
  - Machine Learning and Data Science (Pandas, Numpy, Scikit-Learn, Scipy, PyTorch, TensorFlow, Plotly, Matplotlib)
  - Web (Django, Flask, FastAPI)
- Familiar with: C++, Java, HTML, CSS, JavaScript

### Tools & Technologies

Apache Spark, Apache Kafka, Apache Airflow, Grafana, Git, Docker, MinIO S3

### Databases

PostgreSQL, MySQL, Redis, Elasticsearch, MongoDB, InfluxDB

# Work Experience

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## Machine Learning Engineer

Aug 2020–present

### PARTICLEB

- Worked on different components of an AI-based Algorithmic Trading System:
  - Reduced the runtime of the walk-forward optimization process by **83%** by developing **"A walk-forward optimization framework for algorithmic trading strategies on cloud architecture"**. Tools: Ansible, Airflow, Docker Swarm, MinIO, PostgreSQL.
  - Implemented a parameter optimization service that periodically finds optimal parameters for the algorithmic trading engine. Increased **Rate of Return (RoR)** of the portfolio up to **3%**. Tools: Grafana, Airflow, InfluxDB, MinIO, PostgreSQL.
  - Contributed to developing a **Backtesting Framework** that provides various tools for implementing and testing trading strategies such as fetching data, extracting features, training predictive ML models to generate trading signals, allocating assets, executing orders, and evaluating portfolio performance.
  - Refactored, optimized, and integrated fragmented codes into a Python package used in different services.
- Designed and developed **FIDIBO** Recommendation System (digital platform for Ebooks, Audiobooks, and Podcasts with 2M+ users):
  - Helping **FIDIBO** users discover new and personalized items by developing various recommendation approaches: content-based, collaborative filtering, sequence-aware, and hybrid recommender models.
  - Implemented offline evaluation dashboards (Plotly Dash) to measure performance using different metrics. Enhanced **NDCG@5**, **MAP@5**, and **Coverage** by **50%**, **33%**, and **150%**, respectively.
  - Conducted online evaluations:
    - A/B testing to measure the effect of different recommendations on business metrics. Improved **Click-Through Rate (CTR)** by **22%** compared to the baseline that recommends popular items.
    - Funnel analysis to trace how users interact with real-time recommendations during their journey through the application. Boosted the **Conversion Rate** for "Complete Purchase" and "Add Item to Favorites" actions by **14%** and **8%**, respectively.
  - Utilized Airflow to build ETL pipelines that prepare required data, such as users' historical interactions data (e.g., purchase, reading, and rating) and items metadata, for the recommendation engine.
  - Performed comprehensive Exploratory Data Analysis (EDA) to understand and summarize underlying data and provide informative insights for business stakeholders using visualization and quantitative methods.
  - Developed a service to assign a set of categories for a new item using NLP models.

## PYTHON Developer (Machine Learning, Data Science, Web Applications)

2014–Aug 2020

### FREELANCER

- Designed and implemented an AI-powered audio source separation (vocals/instruments) web application:
  - Clients can easily upload and separate a song into high-quality audio stems in less than a minute (on GeForce 960M) using deep learning instead of time-consuming and imperfect conventional methods.
  - Tools: PyTorch, Flask, Django, and PostgreSQL.
- Developed a system that gives insights about metrics of an organization by performing analytical tasks such as prediction, segmentation, outlier detection, and metric importance analysis using ML algorithms. Tools: Apache Kafka, Redis, and Docker.
- Designed and developed a web-based appointments scheduling, accounting, and management system for a consultation institute:
  - Automated the laborious paper-based system and helped institute staff efficiently manage **40k+** appointments, **9k+** transactions, and **4k+** clients.
- Developed different AI-based services using PyTorch:
  - Sentiment analysis service for Amazon customer reviews dataset using deep RNNs (82.3% accuracy on test dataset).
  - Facial keypoint detection service that recognizes locations of 68 keypoints in an image using deep CNNs.
  - Image captioning service by training an Encoder(CNN)-Decoder(LSTM) network on the **MS COCO** dataset.
  - Hourly energy consumption prediction service using GRU/LSTM networks.
- Developed a multi-label disaster response message classification web application for the **Figure Eight** dataset:
  - Built ETL and NLP pipelines to classify a message for emergency workers. Provided visualizations using Flask and Plotly.
- Developed a 2D Landmark Detection & Robot Tracking (SLAM) using Graph SLAM algorithm:
  - It creates a map and locates landmarks of an environment using sensor and motion data gathered by a self-driving car.

## C/C++ Developer

2007–2011

### KOSARAN HIGH SCHOOL ROBOTICS/PROGRAMMING TEAM

- Developed C/C++ codes to program AVR Micro-controllers for rescue robots.

## Honors & Awards

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- 2018-2019** Best researcher of Shahid Rajaei University award.
- 2017** Recognized as a National Elite by Iran's National Elites Foundation (INEF).
- 2015-2017** **Ranked 1<sup>st</sup>** among all M.Sc. Computer Engineering students in all semesters of studying M.Sc.
- 2015** Received direct admission to Shahid Rajaei University M.Sc. program as an elite student who achieved the highest GPA.
- 2011-2015** **Ranked 1<sup>st</sup>** among all Computer Engineering students in all (eight) semesters of studying B.Sc.
- 2011-2015** Awarded Faculty of Computer and Electrical Engineering prize and scholarship as an exceptional talent student for four consecutive years.
- 2011** Ranked within the top 1% among more than 464,000 applicants in B.Sc. National Universities Entrance Exam, Iran.
- Nov 2009** Qualified for the final round of *Khawrazmi National Robotics Competitions - Rescue League* (Ranked **8<sup>th</sup>** in the final stage), K. N. Toosi University of Technology, Tehran, Iran.
- Apr 2009** Participated as a member of Kosaran High School Robotics Team in **4<sup>th</sup>** *International RoboCup IranOpen Competitions*, Qazvin Azad University, Qazvin, Iran.
- Feb 2009** Participated as a member of Kosaran High School Programming Team in *Iranian High School Students Programming (C++) Competitions*, Sharif University of Technology, Tehran, Iran.