

# 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).

## Work Experience

### Machine Learning Engineer · Eveince (formerly ParticleB)

Aug 2020–May 2022

- 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: Apache Airflow, Docker Swarm, MinIO, PostgreSQL, Ansible, Optuna.
  - 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 **2%**. Tools: Apache Airflow, Docker, MinIO, PostgreSQL, InfluxDB, Grafana, Optuna.
  - 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, allocating assets, executing orders, and evaluating portfolio performance.
  - Refactored, optimized, and integrated fragmented codes into a Python package used in different services.
- Devised and developed FIDIBO Recommendation System (digital platform for Ebooks, Audiobooks, and Podcasts):
  - Helping **3.5M+** users discover personalized items by developing content-based, collaborative filtering, and hybrid recommendation models.
  - Utilized Airflow to build data preparation, embedding generation, batch recommendation prediction, and post-processing pipelines.
  - Enhanced offline evaluation metrics **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.
  - Performed comprehensive Exploratory Data Analysis (EDA) to understand and summarize underlying data and provide informative insights for business stakeholders using visualization and quantitative methods.
  - Created interactive recommendation evaluation and exploration dashboards using Plotly Dash.
  - Launched a service to assign a set of categories for a new item using NLP models.

## PYTHON Developer (Machine Learning, Data Science, Web) · Freelancer

Jan 2014–Aug 2020

- Designed and implemented an AI-powered audio source separation (vocals/instruments) web application:
  - Enabled users to easily upload and separate a song into high-quality audio stems in less than a minute using deep learning instead of time-consuming and imperfect conventional methods. Tools: Deep U-Nets, PyTorch, Flask, Django, 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, Docker.
- Built different AI-based services using PyTorch:
  - **Automatic Image Captioning** service by training an Encoder(CNN)-Decoder(LSTM) network on the MS COCO dataset.
  - **Facial Keypoint Detection** service that recognizes locations of 68 facial keypoints in an image using deep CNNs.
  - **Sentiment Analysis** service for Amazon customer reviews dataset using deep RNNs. Achieved **91.7%** accuracy on test dataset.
  - **Energy Consumption Prediction** service using GRU/LSTM networks.
- Designed and launched a web-based (Django) appointments scheduling, accounting, and management system for a consultation institute:
  - Automated the laborious paper-based system and helped staff efficiently manage **40k+** appointments, **9k+** transactions, and **4k+** users.
- Built a **2D Landmark Detection and Robot Tracking tool using Graph SLAM (Simultaneous Localization and Mapping)** algorithm that creates a map and locates landmarks of an environment using sensor and motion data gathered by a vehicle.

## C/C++ Developer

2007–2011

KOSARAN HIGH SCHOOL ROBOTICS/PROGRAMMING TEAM

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

## Academic Experience

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### 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

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### Programming Languages:

- **Proficient in Python:** Machine Learning and Data Science (Pandas, NumPy, Scikit-Learn, PyTorch, TensorFlow, Plotly) · Web (Django, Flask)
- **Familiar with:** SQL, C++, Java, HTML, CSS, JavaScript

**Tools and Technologies:** Docker, Apache Airflow, MinIO S3, Grafana, Git, Apache Kafka

**Databases:** PostgreSQL, MySQL, InfluxDB, Redis, Elasticsearch

## 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.