

AREF AFZALI

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EDUCATION

SEP 2017 – PRESENT

B.SC. STUDENT OF ENGINEERING SCIENCE, UNIVERSITY OF TEHRAN

- Software Engineering branch
- GPA: 3.40/4 or 16.04/20 (3.625/4 or 16.79/20 In the last 2 years) (rank 5)

SEP 2019 - PRESENT

B.SC. MINOR STUDENT OF COMPUTER SCIENCE, UNIVERSITY OF TEHRAN

- GPA: 3.33/4 (15.91/20)

RESEARCH INTERESTS

- Data Science
- Computational Neuroscience
- Artificial Intelligence
- Machine Learning
- Reinforcement learning
- Data Mining
- Business Intelligence
- Health Care

BOOK AUTHORIZING

- Participating in writing an Open Source Persian Discrete Mathematics Book (In Progress)
 - Supervisor: [Assoc. Prof. Siamak Mohammadi](#)

RELEVANT RESEARCH EXPERIENCE

NEUROSCIENCE

- A Review on Neural Network Models of Schizophrenia
 - Supervisor: [Assoc. Prof. Mohammad Ganjtabesh](#)
 - Reviewed symptoms, modeling approaches, and all neural network modeling papers up to 2020 for my Computational Neuroscience Course's lecture.
- Deep Learning Models of ADHD
 - Reviewed some deep learning models for ADHD for Cognitive Neuroscience competition.

DATA SCIENCE

- Metaheuristic approaches for Vehicle Routing Problem
 - For implementing an API to find an optimum solution for VRP, I needed to search for metaheuristic algorithms and implementing them and selecting the best.
- Address Geocoding Approaches
 - Some ways were implemented by clustering and ML algorithms using Open Street Map but the best way was with Sent2Vec algorithm.
- Data Science for Marketing
 - Supervisor: [Assis. Prof. Ali Fahim](#)
 - For analyzing my customers in my Business Intelligence project I needed to have marketing perspective so I read "Data Science for Marketing" by Yoon Hyup Hwang.

WORK EXPERIENCE

JUL 2020 – APR 2021

DATA SPECIALIST, [CARRIOT COMPANY](#)

- Vehicle Routing Problem(VRP) API using Google ORTools and implemented algorithms
 - Features: Pickup and Delivery (VRPPD), with Time Windows (VRPTW), Open Depots (OVRP), and Multi-Depot (MDVRP)
- Address Geocoding API Based on Sent2Vec Model for Persian Addresses
- Geographic Heat Map
- Acceleration Axis Calibration
- Car Stop Type Detection According to their speed, acceleration, and geographical coordinates data

TEACHING ASSISTANT

- SEP 2021 – PRESENT: Engineering Probability and Statistics (Chief TA)
 - Supervisor: [*Assis. Prof. Behnam Bahrak*](#)
- SEP 2020 – FEB 2021: Numerical Computation (Grader)
 - Supervisor: [*Assis. Prof. Ali Fahim*](#)
- FEB 2020 – JUN 2019: Introduction to Computer and Programming (Grader)
 - Supervisor: [*Assoc. Prof. Manouchehr MoradiSabzevar*](#)
- FEB 2019 – JUN 2019: Digital Logic (Project Designer)
 - Supervisor: [*Dr. Noushin Karimian*](#)

UNIVERSITY RELEVANT PROJECTS

ARTIFICIAL INTELLIGENCE COURSE

- Price Estimation with Regression from scratch
- Image Classification with Multi-Layer Neural Network using Fashion-MNIST dataset
 - Analyzing all of hyperparameter using PyTorch
- Text Processing in News Classification using Bayesian Networks
- Replacement Decoding using Genetic Algorithm
- Pathfinding Algorithms
 - Implementing and Analyzing BFS, DFS, A* Algorithms
- Classification Task using Machine Learning with SciKit-Learn Library
 - Using and Tuning hyperparameter Logistic Regression, KNN, Decision Tree, Random Forest, Bagging, and Hard-Voting

COMPUTATIONAL NEUROSCIENCE COURSE

- Spiking Neural Network Framework
 - Neuron Models: LIF, ELIF, AELIF
 - Connections: Fully Connect, Random Connect
 - Weigh Initial Distribution: Uniform, Normal
 - Encoding: Time-to-First-Spike Encoding, Positional Encoding, Poisson Encoding
 - Learning Rules: Unsupervised Learning (STDP, Flat-STDP), Reinforcement Learning (R-STDP)
- Image Classification using Deep Spiking Neural Network in NengoDL
 - Using MNIST Dataset

BUSINESS INTELLIGENCE PROJECT (B.SC. PROJECT)

- Data Mining in Market Basket Analysis
 - Clustering Customers and Goods
 - Finding Customer Lifetime Value
 - General Report on The Highest Sales of Sellers and Goods
- Basket Recommender Application (In progress)

- Recommend products and customers to sell based on their previous purchases using association rule.

SKILLS

- Data: Python (Pandas, Numpy, Pytorch, Matplotlib, Statistics, Folium, ...), R, Matlab
- DBMS: MySQL, PostgreSQL
- Version Control: Git
- Parallel Programming: POSIX, OpenMP, CUDA
- Back-end Development: C, C++, NextJS, Java (Maven, Apache Tomcat, ...)
- Others: LaTeX, Verilog

Familiar with (used in at least 1 project):

- Shell Scripting
- Big Data: Spark, Hadoop
- DBMS: Neo4j, MongoDB, Elasticsearch, Casandra
- Functional Programming: Scala
- CI/CD: Docker, Kubernetes
- Game Designing: C#, Unity
- Front-end Development: HTML, CSS, VueJS
- Others: Arduino, SEO, Django, Go

RELEVANT COURSES

- Parallel Programming
- Numerical Analysis Methods
- Approximate Methods in Engineering
- Statistical Methods
- Linear Algebra
- Algorithm Design
- Algorithmic Graph Theory
- Artificial Intelligence
- Data Mining
- Distributed Systems
- Computational Neuroscience

Familiar with:

- Cognitive Science
- Reinforcement Learning (ANITI's Reinforcement Learning Virtual School)
- Convolutional Neural Networks (CS231n Stanford Courses)

EXTRACURRICULAR ACTIVITY

- Participate in the second and third Cognitive Neuroscience Competition
- Member of Scientific Student Association of Engineering Science Department
- Judging the Mechatronics Student Competition in Iran hosted by University of Tehran
- 3rd-dan black belt in Kyokushin Karate (Instructing Certificate and Judging Certificate)
- Playing Guitar

HONORS

- Achieving rank 5 among classmates
- Acceptance of the first stage of the national Mathematics and Computer Olympiads
- Karate Honors:
 - 1st place in Iran in Feb 2016 in youth fight competition
 - 3rd place in Iran in Feb 2018 in adult fight competition
 - 3rd place in Iran in Feb 2021 in adult keyhon competition

LANGUAGES

- Persian (Native)
- English (Professional (TOEFL to be taken))
- German (Elementary)