

Yazdan Zandiye Vakili

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[LinkedIn Profile](#)

[GitHub Page](#)

Education

University of Tehran

Tehran, Iran

Bachelor of Computer Science

September 2019 - Jan 2024

- Overall GPA: **17.6/20 (3.7/4)**

National Organization for Development of Exceptional Talents

Tehran, Iran

Diploma in Mathematics and Physics Discipline

September 2014 - June 2018

- Overall GPA: **19.51/20 (4/4)**

Research Interests

- Applied Machine Learning
- Medical Image Analysis
- Data Mining
- Computer Vision
- Natural Language Processing
- Information Retrieval

Work Experience

- **Workflow Company GmbH** | Software Engineer ([IAESTE](#) Internship) | Supervisors : [Gabriel Gruber](#) , [Helga Gruber](#) **Sep 2024 - Present**
Vienna, Austria
 - **Java** (Spring framework)
 - **Git** (Version control)
 - **MySQL** (Database)
 - **Docker**
- **University of Tehran** | Teaching Assistant **Jan 2020 - Present**
Tehran, Iran
 - Teaching assistant at Artificial Intelligence course supervised by [Dr. Hedieh Sajedi](#)
 - Teaching assistant at Introduction to Operating Systems supervised by [Dr. Hedieh Sajedi](#)
 - Teaching assistant at Image Processing supervised by [Dr. Hedieh Sajedi](#)
 - Teaching assistant at General Mathematics II supervised by [Dr. Reza Rokni](#)
 - Teaching assistant at Differential Equations supervised by [Dr. Reza Rokni](#)
 - Teaching assistant at Theory of Computation supervised by [Dr. Fatemeh Halataei](#)
 - Teaching assistant at Basic Programming (2 semesters) supervised by [Dr. Marjan Goodarzi](#)
 - Teaching assistant at Basic Programming supervised by [Dr. Mahdi Seyfipoor](#)
 - Teaching assistant at Machine & Assembly Language supervised by [Dr. Rafei](#)
 - Teaching assistant at Introduction to Bioinformatics supervised by [Dr. Kaveh Kavousi](#)
 - Teaching assistant at Advanced Information Retrieval supervised by [Dr. Bagher BabaAli](#)
- **Karyar College** | Python, Django & Data Analysis Tutor & Course Supervisor | Supervisors : [Negar Rahmati](#) , [Niloufar fazlollahi](#) , [Dr. Arezou Keshavarz](#) **Jul 2020 - Present**
Tehran, Iran
 - Django framework **course supervisor**
 - Advanced Python **course supervisor**
 - Advanced Python Tutor(**Socket Programming, MultiThreading, OOP**)
 - Basic data analysis Tutor(**Pandas, Numpy, Matplotlib, SQL**)
 - Entrance Workshop Tutor (Basic Algorithms)
 - Algorithm Workshop Tutor (**Algorithm Design, Data Structure, Linear Algebra, Introduction to Probability**)
 - Three semester as Advanced Python Teaching Assistant
 - Two semesters as Backend Development with Django Teaching Assistant (**REST Framework, ORM, Postgre, SQLite**)
 - Learned how to work with my colleagues and improved my **Team Work** skills
- **Tadbir Pardaz Company** | Part-time Backend Developer **Dec 2022 - Dec 2023**
Tehran, Iran
 - Documenting the Total Broker Section (TBS) codes for **saving the flow of knowledge** in the company
 - **Launching Confluence System** for documentations in the company

- Backend Development with **ASP.Net, C#**
 - Handle the entrance of the customers data on database (**T-SQL**)
 - Working in a **Scrum** based environment and got familiar with the concepts
 - Learned how to handle the task (**Azure DevOps**) and tune myself with company's flow
 - Worked and got familiar with **RabbitMQ** and **Design Patterns** and **Microservice** system design
 - Got more experienced with **Git** and **project management** systems
- **TaarLab Laboratory** | Part-time AI Research Assistant | Supervisor : [Dr. Taleh Masouleh](#) **May 2023 - Sep 2023**
Tehran, Iran
- Use Deep Learning algorithms for **Image segmentation** and **Image detection**
 - Implement the final model on Delta Robot in TaarLab to Grasp selected items
 - Design the best ANN with good accuracy on detecting the grasp points on selected items in the dataset
 - Make a dataset of about 15 items to train the model for detecting the **grasp points**
 - Using Models like **SVM, MLP, Bayes, KNN, Extreme Learning Models, Ensemble models, Decision Tree, Stacking Models**
 - Using tools like **Numpy, Pandas, Mediapipe, Tensorflow, Pytorch, cv2, matplotlib, seaborn, transformers, sci-kit learn ...**
- **Ghavamchi Institution** | Internship **Oct - Dec 2019**
Tehran, Iran
- Backend Development with **ASP.Net Core, C#**
 - Developing in Informatics, Exams section
 - Got familiar with the **Project Life Cycle**

Notable Projects

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- **Comparison on PET Scan images to find similar regions on Parkinson patients** | [GitHub Repo](#) **January 2024**
Supervisor: [Dr. Kaveh Kavousi](#)
- Utilized Convolutional Neural Networks (CNN) for feature extraction and employed shift-mean clustering on PET scans. Similar regions were identified using a correlation matrix, facilitating a biomedical analysis of patients within the same cluster, based on the LONI PPMI dataset.
- **Classification on USA flight dataset using DeepLearning methods** | [GitHub Repo](#) **December 2023**
Supervisor: [Dr. Hedieh Sajedi](#)
- I employed a variety of preprocessing techniques, including Linear Discriminant Analysis (LDA), Principal Component Analysis (PCA), and AutoEncoders, to prepare the dataset for analysis. Subsequently, I trained a deep neural network to classify the United States flight data, which was obtained from an official government dataset. This comprehensive approach aimed to enhance the predictive accuracy and model performance on the given dataset.
- **Comparison on multiple document rankings' method** | [GitHub Repo](#) **December 2023**
Supervisor: [Dr. Bagher BabaAli](#)
- Vector Space and Probabilistic Models, along with n-gram based Language Models, were applied to the dataset to conduct a comparative analysis of their outcomes.
- **Sequence alignment on E.Coli sequence genome** | [GitHub Repo](#) **November 2023**
Supervisors: [Dr. Kaveh Kavousi](#) [Dr. Alireza Fotouhi](#)
- Indexing and sequence alignment for E. coli were efficiently executed using tools such as BLAST, SPAdes, and FastQC, ensuring thorough analysis and quality control of the bacterial genome.
- **Comparison on multiple text classification methods** | [GitHub Repo](#) **October 2023**
Supervisor: [Dr. Bagher BabaAli](#)
- I compared probabilistic (Naive Bayes) and embedding (Word2Vec, GloVe, FastText) techniques, augmented with SVM and a hybrid LSA-SVM model, and reported their performance metrics.
- **A Maze Solver agent using Q-learning algorithm** | [GitHub Repo](#) **January 2023**
Supervisor: [Dr. Hedieh Sajedi](#)
- In this project, I had to create different episodes for the agent, define optimal rewards, and fill out the Q-table accordingly using the Q-learning algorithm.
- **A comparison among Pathfinding algorithms for solving the 8 Puzzle problem** | [GitHub Repo](#) **December 2022**

Supervisor: [Dr. Hedieh Sajedi](#)

Using DFS, BFS, IDS, UCS, and A*, I solved the 8 Puzzle problem, and afterward, I compared their time and space complexities.

Publications

- **Enhancing Sentiment Analysis of Persian Tweets: A Transformer-Based Approach** | [Paper](#)

April 2024

Supervisor: [Dr. Hedieh Sajedi](#)

This paper examines sentiment analysis on Persian Twitter media, focusing on improving the accuracy of sentiment classification by integrating multiple models. While traditional models like Support Vector Machines (SVM), Naive Bayes, and Multi-Layer Perceptrons (MLP) alone do not produce high-quality results, the research presents a hybrid model combining Naive Bayes, a custom rule-based approach, and the transformer model BERT. The hybrid model achieves 89% accuracy, surpassing BERT's standalone performance of 86%. Despite its slightly increased structural complexity, the hybrid model maintains similar computational intensity to BERT fine-tuning, demonstrating its enhanced effectiveness for sentiment analysis in social media contexts.

- **A comprehensive comparison of various drug synergy score prediction methods** | [Paper](#)

January 2024

Supervisor: [Dr. Changiz Eslahchi](#)

In our paper, "A comprehensive comparison of various drug synergy score prediction methods," we conducted an in-depth examination of modern techniques for predicting drug synergy. Our focus was on comparing these methods to improve therapeutic outcomes and understand the biological interactions in cancer treatments. We specifically analyzed how different drug combinations affected various cancer subtypes, considering their molecular characteristics and response to treatments. The study aims to contribute to precision oncology by highlighting the effectiveness and limitations of different synergy score calculation methods, ultimately guiding more targeted and effective cancer therapies.

- **Distilled BERT Model In Natural Language Processing** | Accepted by IEEE Conference (ICCKE) (Not Published Yet)

September 2024

Supervisor: [Dr. Hedieh Sajedi](#)

This paper provides an overview of the evolution of Natural Language Processing (NLP) models, with a focus on distillation techniques used to create smaller, more efficient versions of large models. While traditional NLP models had limitations in scalability and contextual understanding, transformer models like BERT significantly advanced the field, though at the cost of high computational demands. The review explores several distilled models, such as TinyBERT, DistilBERT, MobileBERT, and MiniLM, which use knowledge distillation to reduce size while maintaining high performance. These models are optimized for deployment on resource-limited devices, making sophisticated NLP technologies more accessible for practical applications.

- **AI-Based Models for Dysgraphia Diagnosis on Handwritten Images: A Comprehensive Scoping Review** | Under Revision by Plos one journal

September 2024

Supervisor: [Dr. Hedieh Sajedi](#)

This paper reviews studies that utilize artificial intelligence (AI) models for diagnosing dysgraphia, a neurodevelopmental disorder that affects writing skills and is often misdiagnosed. The scoping review evaluates research articles focused on AI-based predictive models using image processing of handwritten images for dysgraphia detection. The study highlights that AI models, particularly Convolutional Neural Networks (CNNs) and Support Vector Machines (SVMs), achieved high accuracy rates, often exceeding 90%. However, challenges such as small datasets and language-specific models persist. The paper recommends future research to address these issues with larger, diverse datasets and language-independent models to enhance dysgraphia diagnosis and management.

- **An Approach to Accurate Recognition of Emotions through Speech-to-Image Signal Conversion and Deep Convolutional Neural Networks** | Submitted (Multimedia Tools and Applications)

September 2024

Supervisors: [Ajith Abraham](#), [Arash Ahmadi](#), [Dr. Mohammad Reza Falahzadeh](#)

This paper explores an innovative approach to speech emotion recognition by transforming speech signals into visual representations called chaograms, which are then processed using deep convolutional neural networks (DCNNs). The method converts speech signals through reconstructed phase space into chaograms, allowing models such as AlexNet, VGG16, InceptionV3, and ResNet50 to classify emotions. Transfer learning and fine-tuning techniques are applied to enhance model performance and training speed. Tested on the EMO-DB and eNTERFACE05 datasets, the proposed

method significantly outperforms previous work, achieving high accuracy rates of up to 97.68% on EMO-DB and 92.34% on eINTERFACE05, demonstrating the effectiveness of the approach in emotion recognition.

- **Combining Minimum Spanning Tree and Label Propagation for Robust Pathway Enrichment: A Case Study on Glioblastoma and Colorectal Cancer** | Submitted (BMC Bioinformatics)

September 2024

Supervisor: [Dr. Kaveh Kavousi](#)

This paper presents a novel approach to gene enrichment analysis for complex diseases, specifically Glioblastoma (GBM) and Colon Adenocarcinoma (COAD), by combining the Minimum Spanning Tree (MST) and Label Propagation Algorithm (LPA). The method aims to address limitations in traditional gene enrichment techniques. Differentially expressed genes (DEGs) from The Cancer Genome Atlas (TCGA) were analyzed, and protein-protein interaction (PPI) networks were constructed using the STRING database. The MST identified significant interactions, while LPA revealed clusters that underwent KEGG pathway enrichment analysis. Notable interactions were uncovered, such as BEST3-METTL1 in GBM and AREG-AXIN2 in COAD, along with key pathways related to cancer progression. This method provides a more precise understanding of molecular mechanisms and potential therapeutic targets in GBM and COAD, improving upon traditional gene enrichment analysis.

Relevant Courses

- Artificial Intelligence | **Score:** 19.3/20
- Linear Algebra | **Score:** 19.5/20
- General Biology | **Score:** 16.5/20
- Fundamentals of Combinatorics | **Score:** 19.78/20
- Fundamentals of Operating Systems | **Score:** 17.2/20
- Introduction to Computing systems and Programming | **Score:** 18.25/20
- Introduction to Theory of Computation | **Score:** 18.5/20
- Introduction to Bioinformatics | **Score:** 19.4/20<
- Advanced Information Retrieval | **Score:** 19.74/20
- Data Mining | **Score:** 18/20
- General Calculus I | **Score:** 19.24/20
- Advanced Programming | **Score:** 16.87/20
- Theory of Computation | **Score:** 19.5/20
- General Mathematics II | **Score:** 18.77/20
- Machine Learning | **Score:** 16.39/20

Honors and Awards

- Faculty of Engineering Top Student of the Year (the FOE Award) | [View Certificate](#)

September 2019

Relevant Licenses and Certificates

- *Task oriented course in data analysis with python* | **Presented by:** [Quera](#) | [View Certificate](#) November 2023
- *Neural networks and deep learning* | **Presented by:** [Coursera](#) | [View Certificate](#) October 2023
- *Unsupervised learning, Recommenders, Reinforcement Learning* | **Presented by:** [Coursera](#) | [View Certificate](#) July 2023
- *Machine learning specialization* | **Presented by:** [Coursera](#) | [View Certificate](#) July 2023
- *Advance learning algorithms* | **Presented by:** [Coursera](#) | [View Certificate](#) July 2023
- *Supervised machine learning: Regression, Classification* | **Presented by:** [Coursera](#) | [View Certificate](#) May 2023
- *Advanced Python Programming & Object Oriented Thinking Course* | **Presented by:** [Quera](#) | [View Certificate](#) October 2022

Programming Skills

- Python (Pytorch, Tensorflow, Scikit-Learn, Numpy, Pandas, C# & C++ (Object-Oriented Programming)
- Matplotlib, Seaborn, Django
- Java
- LATEX
- Assembly (AVR, 8086)
- Jupyter Notebook
- JavaScript
- HTML5
- SQL
- CSS3

Languages

- Persian (Farsi) | Native
- English | Advanced (**IELTS** - Overall score: **8** | [Results](#))
- German (Duetsch) | Elementry