Zahra Dashtgard

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Education

University of Tehran *Tehran, Iran*

B.Sc. in Computer Science *2018 - 2022*

- Among Iran's Three Best Universitiee
- CGPA: 3.45/4
- Thesis: Diagnosis of Pulmonary Diseases Using Respiratory Data

Farzanegan *Qaen, Iran*

High School *2014 - 2018*

- Diploma in Mathematics and Physics Discipline
- Affiliated with the National Organization for the Development of Exceptional Talents (NODET)

Research Experience

Data Science and Modeling Research Laboratory *Under supervision of Prof. A. Jamshidi* *Tehran, Iran*

Undergraduate Research Assistant *2021 - 2022*

- Collaborated with a two-person team to study how respiratory diseases affect the voice production system by analyzing glottal flow and its characteristics.

Teaching Experience

University of Tehran *Tehran, Iran*

Teacher Asistant

- **Design and Analysis of Algorithms**
  M. Gangtabesh 2022
- **Assembly**
  A. Nowzari 2022
- **Principles Of Computer Systems**
  B. Babaali 2022
- **Operating System**
  A. Khalilian 2021
- **Design and Analysis of Algorithms**
  M. Gangtabesh 2021
- **(Head TA) Statistical Method**
  H. Missai 2021
- **Statistical Method**
  H. Missai 2020

Research Interests

- Computational Medicine
- Bioinformatics
- Biomedical Signal Processing
- Natural Language Processing
- Biomedical Informatics
- Data Science
- Deep Learning
- Machine Learning

Relative Projects

Detection and Diagnostic Approach of COVID-19 Based on Cough Sound Analysis *Python, Matlab*

In this project, we leverage deep learning to identify COVID-19 coughs by investigating the structure of the human sound production system and realizing that its fundamental features change during illness. These fundamental features were then extracted from cough signals to detect early signs of COVID-19 using a deep-learning model.

2022

Implementing SR-MCL for Identifying Functional Modules in Interaction Networks *Python*

Markov clustering algorithm (MCL) is one of the most famous graph clustering algorithms. However, it has its downsides; For instance, MCL does not scale well, even to moderate-sized graphs. Hence, soft regularized Markov clustering (SR-MCL) was implemented in this project to recognize overlapping clusters in large graphs, such as protein-protein interaction networks. *2022*

DNA Analysis App *Python*

In this project, a GUI is designed using the suffix tree (implemented by the Ukkonen algorithm) for DNA sequence analysis approaches. *2021*

Image Segmentation Using Genetic Algorithm *Python*

In this project, we hired Genetic Algorithm (GA) for the image segmentation process, which is a method that a digital image is broken down into various subgroups called Image segments. At each step, GA selects individuals from the current population and uses them as parents to produce children for the next generation. After that, parents will be selected based on their fitness, and this process will continue until we reach a proper answer. *2022*

Implementing Bio-Inspired Algorithm *Python*

Metaheuristic algorithms are very suitable for optimization problems. Therefore, We implemented several of these algorithms to solve several well-known optimization problems. *2021*

- Simulated Annealing, Ant Colony, Self-Organizing Maps and Genetic and Memetic Algorithm for TSP problem.
- Hill climbing and Simulated Annealing algorithm for finding the minimum of Rastigin Function.

Skills and Qualities

Programming Python (Pandas, PyTorch, NumPy, Scikit-learn. etc.), R, C++.

Miscellaneous Linux, LaTeX, Git.

Languages
- Persian (Native)
- English (Full professional proficiency)

Relevant Courses

- **Bioinformatics**
  University of Tehran, by Z. Mousavian.
- **Biology**
  University of Tehran by R. Naderloo.
- **Artificial Intelligence**
  University of Tehran, by H. Sajedi.
- **Design and Analysis of Algorithms**
  University of Tehran by M. GanjtaDatabesh.
- **Deep Learning**
  University of Tehran, by B. Babaali.
- **Data Mining**
  University of Tehran, by H. Sajedi.
- **Bio-Inspired Algorithms**
  University of Tehran, by B. Babaali.
- **Database**
  University of Tehran, by A. khalilian.

Reference

Dr. Hamidreza Modares, *Assistant Professor*, Department of Mechanical Engineering, Michigan State University
Email: modaresh@msu.edu