Amirali Molaei

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EDUCATION

1. Oct. 2020 - present
Master : Computer Engineering – Artificial Intelligence & Robotics
School of Computer Engineering, Iran University of Science and Technology (IUST), Tehran, Iran
   - GPA: 18.61/20 – 4/4
   - Supervisor: Prof. Mohammadreza Jahedmotlagh
   - Thesis: Sarcasm Detection using transformer models via contrastive learning approach
2. Sep. 2015 - July 2019
Bachelor : Mechanical Engineering
Faculty of Mechanical Engineering, Islamic Azad University Tehran North Branch, Tehran, Iran
   - GPA: 16.09/20

RESEARCH INTERESTS

Computer **V**ision, **N**atural **L**anguage **P**rocessing, **E**xplainable **AI**, **M**edical **I**mage **A**nalysis, **R**einforcement **L**earning

PUBLICATIONS

R. Azad, A. Kazerouni, M. Heidari, E. K. Aghdam, A. Molaei, Y. Jia, A. Jose, R. Roy and D. Merhof, "Advances in Medical Image Analysis with Vision Transformers: A Comprehensive Review," *arXiv preprint arXiv:2301.03505,* 2023. (Submitted to Medical Image Analysis journal)

A. Aminimehr, P. Khani, A. Molaei, A. Kazemeini and C. Erik, "Tbexplain: A Text-Based Explanation Method for Scene Classification Models with the Statistical Prediction Correction," *Available at SSRN 4385953,* 2023. (Submitted to Expert Systems with Applications journal)

A. Aminimehr, A. Molaei and C. Erik, " EnTri: Ensemble learning with tri-level representations for explainable scene recognition," 2023. (Submitted to Pattern Recognition journal)

RESEARCH EXPERIENCES

Researcher, Complex systems Lab, IUST**,** Tehran, Iran**, Dec.2020**
- **Research Title**: Neural-Symbolic Visual Question Answering
- **Task:** Visual Question Answering
- **Methods:** Neural-Symbolic
- **Description:** Training a Visual Question Answering model with a neural-symbolic approach that is capable of high-level reasoning and preserves interpretability by learning an Object-based representation from images and mapping the questions to programs, then running these programs on the representation with a symbolic executor to obtain the answer to the corresponding question.

Research, Data Mining Lab, IUST**,** Tehran, Iran, **Dec.2020**
- **Research Title** Argument mining and summarization
- **Task:** Key point analysis
- **Methods:** Transformers

  Description: Summarizing arguments by extracting salient key point and matching these key points to each argument and predicting the most prevalent key point.

Researcher, Project for Reinforcement Learning, Tehran Unviersity, Tehran, Iran, **Jan. 2022**
- **Research Title**: Multi-Agent Opinion Formation via Reinforcement Learning
- **Methods:** Monte Carlo and Q-Learnig
- **Description:** Agents learned how to reach consensus on an opinion by maximizing social cumulative reward in a Multi-Agent environment.

Researcher, Project for Reinforcement Learning, Tehran Unviersity, Tehran, Iran, **Jan. 2022**
- **Research Title**: Multi-Agent Opinion Formation via Reinforcement Learning

- **Methods:** Monte Carlo and Q-Learnig
- **Description:** Agents learned how to reach consensus on an opinion by maximizing social cumulative reward in a Multi-Agent environment.

Researcher, Survey on Implicit Neural Representation, **Jan. 2023 - present**

- **Research Title**: Implicit Neural Representation in Medical Image Analysis
- **Description:** Implicit neural representations are a recent approach to signal representations that have shown promise in various computer vision applications, including medical image analysis. Instead of parameterizing signals with discrete representations such as grids, voxels, point clouds, and meshes, a fully connected multi-layer perceptron can be learned to continuously represent the signal of interest as an implicit function, mapping its spatial coordinates to their corresponding values.

TEACHING EXPERIENCES

Teaching Assistant, IUST**,** Tehran, Iran September & 2022 – January & 2023

- **Course:** Natural Language Processing
- **Instructor:** Prof. Behrouz Minaei Bidgoli
- **Responsibilities:**
  - Led a team of teaching assistants in providing assignments, exams, final exams, and projects
  - Instructed sequence to sequence models, Recurrent Neural Networks, and the principles of Transformer networks
  - Assigned leadership roles to other teaching assistants for handling and evaluating students' projects

Teaching Assistant, IUST**,** Tehran, Iran January & 2022 – July & 2022

- **Course:** Advanced Data Mining
- **Instructor:** Prof. Behrouz Minaei Bidgoli
- **Responsibilities:**
  - Instructed sequence to sequence models, Recurrent Neural Networks, and the principles of Transformer networks
  - Designed the assignments and the final exam
  - Managed and evaluated the final projects of students

Teaching Assistant, IUST**,** Tehran, Iran October & 2021 – January & 2022

- **Course:** Neural Networks
- **Instructor:** Prof. Nasser Mozayani
- **Responsibilities:**
  - Designed an assignment on Adaptive Resonance Theory and Hopfield networks

Teaching Assistant, IUST**,** Tehran, Iran October & 2021 – January & 2022

- **Course:** Natural Language Processing
- **Instructor:** Prof. Behrouz Minaei Bidgoli
- **Responsibilities:**
  - Designed an assignment on text classification and spell correction topic
  - Managed and evaluated the projects of a group of students

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TECHNICAL SKILLS

Deep **L**earning, **M**achine **L**earning, **R**einforcement **L**earning, **N**atural **L**anguage **P**rocessing, **Programing Language**: **P**ython **P**rogramming, **T**ransformer **L**ibrary, **M**atplotlib, **S**cikit-**L**earn, **G**ym, **N**umpy, **S**eaborn, **S**oftware**: M**icrosoft **O**ffice, **M**endeley, **P**yCharm, **A**naconda, **G**oogle-**C**olab

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CORE COURSES

Neural **N**etworks, **P**attern **R**ecognition, **N**atural **L**anguage **P**rocessing, **M**achine **L**earning**, R**einforcement **L**earning, **A**dvanced **D**ata **M**ining, **D**istributed **S**ystems, **M**ulti-Agent **S**ystems

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REFERENCES

1. **Dr.Mohammadreza Jahed-Motlagh**, *School of Compute Engineering, Iran University of Science and Technology, Tehran*
   Phone: +98-912-104-5576
   Jahedmr@iust.ac.ir

2. **Dr.Behrouz Minaei Bidgoli**, *School of Compute Engineering, Iran University of Science and Technology, Tehran*
   Phone: +98-912-536-0306
   b_minaei@iust.ac.ir

3. **Dr.Nasser Mozayani**, *School of Compute Engineering, Iran University of Science and Technology, Tehran*
   Phone: +98-912-297-6682
   Mozayani@iust.ac.ir