Arian Qazvini

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Research Interests

- Trustworthy ML
- Explainable AI
- Natural Language Processing
- Computer Vision

Education

Amirkabir University of Technology (Tehran Polytechnic) — Tehran
B.Sc, Computer Engineering — *Sep. 2020 – Current*

- GPA: **18.5**/20 (**3.87**/4.0) - Last two years: **18.79**/20 (**4.0**/4.0)
- Thesis: Design and Implementation of a Cross-Lingual Image Captioning Model for Persian and English Using Transfer Learning

Alborz High School — Tehran
High School Diploma in Mathematics and Physics — *Sep. 2017 – August. 2020*

- GPA: **19.59**/20

Publications

Seyedeh Fatemeh Ebrahimi, Karim Akhavan Azari, Amirmasoud Iravani, **Arian Qazvini**, Pouya Sadeghi, Zeinab Taghavi, Hossein Sameti. "**Sharif-MGTD at SemEval-2024 Task 8: A Transformer-Based Approach to Detect Machine Generated Text**". In Proceedings of the 18th International Workshop on Semantic Evaluation (SemEval-2024), [Paper]

Research Experience

Okinawa Institute of Science and Technology
Research Assistant under supervision of [Dr. Mohammad Sabokrou](#) — *May 2024 - Current*

- Collaborating on research to improve image classification models by enhancing their focus on primary objects rather than background elements.
- Exploring different white-box and black-box adversarial attacks.
- Investigating various regularization terms to modify the loss function, aiming to enhance its robustness against adversarial attacks. The paper is in progress.

Amirkabir University of Technology (NLP Lab)
Research Assistant under supervision of [Dr. Saeedeh Momtazi](#) — *Feb 2024 - Current*

- Developing a cross-lingual image captioning model for Persian and English. Focused on evaluating various vision-language models and different fine-tuning methods, alongside exploring cross-lingual learning strategies.
- Investigating the effect of using triples (Subject, Verb, Object) beside captions for the fine-tuning process. The paper is in progress

Sharif University of Technology (Speech and Language Processing Lab)
Research Intern under supervision of [Dr. Hossein Sameti](#) — *Sep 2023 - Feb 2024*

- Researched on different methods for detecting machine-generated text from human-generated one. Fine-tuned a RoBERTa-base transformer. The paper was accepted at SemEval-2024

Projects

ResNet18 Adversarial Attacks [Github] — Summer 2024

Tested various adversarial attacks, including PGD, AutoAttack, FGSM, and C&W, on a ResNet18 model trained on the RIVAL10 dataset, comparing their attack success rates.

Black-Box Adversarial Attack [Github] — Summer 2024

Implemented a black-box adversarial attack using a ResNet50 surrogate model to target a ResNet18 victim model, incorporating visualizations of clean and adversarial images through Guided Grad-CAM and Guided Backpropagation for explainability.

GIT Fine-Tune [Github]   Summer 2024

    Developed and compared normal fine-tuning and LoRA adaptation techniques on the GIT model for image captioning using the Flickr 8k dataset, with CIDEr, SPICE, and METEOR metrics used for evaluation.

Image Captioning Using CNN and LSTM [Github]   Fall 2023

    Implemented an image captioning system utilizing VGG16 for visual features extraction and LSTM networks for caption generation.

Information Retrieval Engine [Github]   Spring 2024

    Implemented a Persian text search engine for news articles using information retrieval techniques such as tokenization, normalization, stemming, and ranking based on TF-IDF weighted cosine similarity.

Computational Intelligence Course Projects [Github]   Spring 2023

- Programmed neural networks from scratch for house price prediction and binary classification for the MNIST dataset.
- Fuzzy logic-based controller for self-driving car
- Genetic Algorithm

SKILLS

Programming Languages: C, Python, Java

Libraries: PyTorch, Pandas, Matplotlib, Scikit-learn, Langchain

Web Development: HTML/CSS,JavaScript Django/Django REST

Tools: LaTeX, Docker, Git, Google Colab, VS Code, PyCharm, IntelliJ

Database Management Systems: MySQL

Languages: Persian: Native, English: Advanced (TOEFL iBT: 103, R27, L26, S24, W26)

TEACHING EXPERIENCE

Applied Linear Algebra, Dr.Mazlaghani	Spring 2024
Data Mining, Dr.Nazerfard	Spring 2024
Operating Systems, Dr.Ziaeetabar	Spring 2024
Artificial Intelligence, Dr.Javanmardi	Spring 2024, Fall 2023, Spring 2023
Microprocessor and Assembly, Dr.Farbeh	Fall 2023
Computer Architecture, Dr.Cheshmikhani	Spring 2023
Applied Linear Algebra, Dr.Nazerfard	Fall 2022
Advanced Programming, Dr.Kalbasi & Dr.Zeinali	Spring 2022

ONLINE COURSES

- **Supervised Machine Learning**
  Stanford University [Certificate]

- **Advanced Learning Algorithms**
  Stanford University [Certificate]

- **Natural Language Processing Specialization**
  DeepLearning.AI [Certificate]

- **Data Analytics Bootcamp**
  University of Tehran [Certificate]

HONORS AND AWARDS

Ranked among the **top 15%** of students based on GPA at Amirkabir University of Technology.

Achieved 356th (239th regional) place among about 135K applicants in University Entrance Nationwide Exam for B.Sc in Math and Physics (Konkour).

Achieved 423th (223rd regional) place among about 129K applicants in University Entrance Nationwide Exam in Foreign Languages - English (Konkour).

EXTRACURRICULAR ACTIVITIES

4th Amirkabir Artificial Intelligence Student Summit (AAISS) Head of Scientific Committee

    Led the scientific team in selecting and inviting presenters for the event.