Arian Qazvini

arianqazvini@gmail.com | +98 993 083 2439 | ArianQazvini | arian-qazvini | Website

Research Interests

- Natural Language Processing (NLP)
- Information Retrieval
- Data Mining
- Multi-modal Models

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: **19.54**/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, using transfer learning techniques. Focused on evaluating various vision-language models and fine-tuning methods such as LoRA, QLoRA, and GaLore, alongside exploring cross-lingual learning strategies. (Thesis)

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. The paper was accepted at SemEval-2024.
- Fine-tuned a RoBERTa-base transformer.

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 on October 16th, 2024)

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

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

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

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