Kian Shokraneh

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Education

Amirkabir University of Technology (Tehran Polytechnic) **September 2020 – Present**
Bachelor of Science in Computer Engineering *Tehran, Iran*

- CGPA: 3.96/4 (18.75/20)
- Thesis: *Using Retrieval-Augmented Generation and Large Language Models for Open Domain Question Answering*

Allameh Tabatabaei Complex of Cultural and Educational **September 2017 – June 2020**
High School Diploma in Mathematics and Physics *Tehran, Iran*

- CGPA: 4/4 (19.33/20)

Selected Courses

- Algorithm Design: 20/20
- Software Testing: 20/20
- Data Structures and Algorithms: 20/20
- Advanced Programming: 19.1/20
- Artificial Intelligence: 18/20
- Computational Intelligence: 18/20
- Information Retrieval: 18.26/20
- Compiler Design: 18.66/20

Skills

Languages: Persian (Native), English (Fluent; TOEFL on Oct 27, 2024)
Programming Languages: Python, Java, C, HTML/CSS, JavaScript, SQL
Libraries & Frameworks: PyTorch, Scikit-learn, Pandas, NumPy, Matplotlib, Transformers, Django, Django REST Framework (DRF), Bootstrap
Techs & Tools: Git, Docker, PostgreSQL, LaTeX, Nginx, Postman, Amazon S3, Google Colab, Kaggle

Research Interest

- Computer Vision and Image Processing
- Natural Language Processing (NLP)
- Trustworthy ML
- Explainable AI and Model Interpretability

Research Experience

Research Assistant, Okinawa Institute of Science and Technology (Remote) **March 2024 – Present**
***Supervisors**: Mohammad Sabokrou, Mohammad Khalooei*

Trustworthy Machine Learning and Object-Focused Computer Vision

- Conducted research to ensure computer vision models focus on primary objects instead of background elements, analyzing state-of-the-art methods and papers.
- Developed and implemented adversarial approaches to improve the robustness and accuracy of models.
- Worked on designing regularization terms for loss functions to improve model reliability and focus.

Research Assistant, Amirkabir University of Technology **March 2024 – Present**
***Supervisor**: Saeedeh Momtazi, Computer Engineering Department*

Using Retrieval-Augmented Generation and Large Language Models for Open Domain Question Answering
(Thesis Project)

- Exploring RAG and LLMs for Persian question answering using Wikipedia for open-domain tasks.
- Fine-tuning XLM-RoBERTa on PQuAD for enhancing Persian language response accuracy
- Developing a RAG-based system combining retrieval and generative models (e.g., GPT, LLaMA).

Teaching Experience

Teaching Assistant, Amirkabir University of Technology, Tehran, Iran

- Software Engineering, Instructor: Faezeh Gohari *Fall 2024*
- Software Testing, Instructor: Faezeh Gohari *Fall 2024*
- Applied Linear Algebra, Instructor: Maryam Amirmazlaghani *Spring 2024*
- Advanced Programming (Java), Instructor: Fatemeh Ziaeetabar *Fall 2023*

Work Experience

Backend Developer **April 2022 – December 2023**

Gozar Team (Website) (LinkedIn) *Tehran, Iran*

- Specialized in backend development using Django and Django REST Framework (DRF).
- Designed project architecture and database schemas.
- Deployed and managed applications on Linux servers.
- Collaborated on frontend implementation using HTML, CSS, and Bootstrap as a secondary focus.

Selected Projects

Model Robustness and Interpretability Projects

- **Regularization and Robustness Evaluation Using SHAP** | *GitHub*
  - Applied SHAP-based regularization and FGSM adversarial training to assess the robustness of a model on MNIST.
- **Captum Attribution Metrics Analysis** | *GitHub*
  - Evaluated Captum attribution methods on CIFAR-10 using infidelity and sensitivity metrics.
- **Captum Interpretability Demonstrations** | *GitHub*
  - Used Grad-CAM, Integrated Gradients, and Gradient SHAP for ResNet18 interpretation and transparency.
- **Background Importance Analysis Using Gradient SHAP** | *GitHub*
  - Analyzed background influence on ResNet18 with Gradient SHAP and visualized attribution values.
- **Adversarial FGSM Comparisons** | *GitHub*
  - Compared FGSM implementations across different libraries on ResNet18 (CIFAR-10) and analyzed ASR for robustness.

Question Answering on PQuAD | *GitHub*

- Fine-tuned XLM-RoBERTa on PQuAD to enhance Persian question answering.
- Handled data preprocessing, fine-tuning, and evaluation using Hugging Face Transformers.

Information Retrieval System on News | *GitHub*

- Developed a retrieval system with indexing, querying, and relevance ranking using TF-IDF and vector space models.
- Optimized search algorithms to enhance precision, recall, and user satisfaction.

Fuzzy Self-Driving Car Simulator | *GitHub*

- Implemented a fuzzy logic system for simulating self-driving car's decision-making in various conditions.
- Developed and optimized fuzzy rules for obstacle avoidance and speed control.

Super Mario AI | *GitHub*

- Optimized Super Mario's behavior using Genetic Algorithms for improved navigation.
- Implemented fitness functions to enhance adaptation and performance, refining decision-making across scenarios.

Pac-Man AI | *GitHub*

- Applied A*, DFS, and BFS in UC Berkeley's CS 188 Pac-Man AI to optimize navigation.
- Used Expectimax and Minimax for adversarial agents, integrating reinforcement learning for better adaptability.

Honors & Awards

- Ranked 189th in the Iran's national university entrance exam (Konkour), placing in the top 0.1% among more than 155,000 participants.

References

- **Mohammad Sabokrou, Assistant Professor** | *Okinawa Institute of Science and Technology, Unit MLDS*
- **Saeedeh Momtazi, Associate Professor** | *Amirkabir University of Technology,*

September 2024