

# Mehrdad Rafiepour

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## Summary

- ♦ Motivated researcher, with 3 years of experience in natural language processing, resulting in 2 publications.
- ♦ An experienced programmer with a 5-year history of publishing mobile applications.
- ♦ Strong communication skills in English, facilitating effective collaboration.

## Education

🎓 M.Sc. in Computer Engineering, University of Kashan	Sep 2019 - Feb 2023
Thesis: Proposing a Model for Natural Language Understanding Using Deep Neural Networks	GPA: 4.0 (out of 4)
🎓 B.Sc. in Computer Engineering, University of Qom	Sep 2013 - Feb 2018
Project: Designing and Implementing an Assistant Program for the Visually Impaired in Android	GPA: 3.1 (out of 4)

## Research Interests

- ♦ Dialogue Systems
- ♦ Large Language Models
- ♦ Natural Language Understanding
- ♦ Natural Language to Database Query
- ♦ Natural Language Processing for Social Good
- ♦ Alterations of the Transformer Architecture in Textual Data

## Publications

Article	Citations	Year
<b>Rafiepour, Mehrdad;</b> Sartakhti, Javad Salimi “CTRAN: CNN-Transformer-based network for natural language understanding” Engineering Applications of Artificial Intelligence. Volume 126C.	10	2023
<b>Rafiepour, Mehrdad;</b> Abdolalizade, Zahra; Vahidipour, Seyed Mahdi “Distinguishing dense networks from pseudo-tree networks for link prediction based on homogeneity and heterogeneity criteria” The second national informatics conference of Iran, <b>In Farsi</b>	-	2021

## Academic Projects

- NoSQL Query Generation for Answering Natural Language Questions Using Reinforcement Learning  
Details: The project involved designing a pointer network model to fill empty slots in an Elasticsearch query. The first of the two novel ideas was the introduction of a bounty reward that encouraged the agent to explore unchosen options of the batch, while the second idea was separating the reward for partial and full matches.
- A Transformer-Based Network for Natural Language to SQL Conversion  
Details: Implemented a modular model based on Transformers to generate an executable SQL query for the WikiSQL dataset. Further progress was hindered because of the lack of computational resources and razor-thin margins between top-performing models.
- Simulating Multidimensional Markov Models Using Petri Nets for Game Map Generation  
Details: Utilizing the in-house PetriNet library, this research focused on creating a Petri model based on a Multidimensional Markov Model to generate playable game maps for two-dimensional games.

## Skills

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**Natural Language Processing:** PyTorch, HuggingFace, NetworkX, Numpy, Pandas, Scikit-Learn, Keras

**Development Environments:** Pycharm, DataSpell, Jupyter, Eclipse, Android Studio, MatLab, VSCode

**Programming Languages:** Python, Java, PHP, Bash, C#, C++

**General Knowledge:** Ubuntu, Remote Development, Networking, LaTeX, Office Products

## English Proficiency

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**IELTS (Academic)**

January 2024 – January 2026

**Overall band score: 8.0**

Listening: 8.5

Reading: 8.5

Writing: 8.0

Speaking: 7.5

## Work Experience

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### ◆ Self-employed, Full-Stack Android Developer

2014-2019

- Published over 10 Android applications targeting the Iranian local market, with 5 achieving significant success
- Responsible for all aspects of development, including client-side and server-side implementations
- Practical experience with concepts such as Object-Oriented Programming and Minimum Viable Product and the Model View Component design pattern
- Hands-on experience with Java, Python and PHP

### ◆ Highlighted Projects

#### • Hamyar

Details: An accessibility app developed during my undergraduates' final project that streamlined smartphones' functionality for the visually impaired who only understood Farsi. Hamyar was essentially a finite state machine functioning as a kiosk on top of the operating system, offering different possibilities, including making calls, getting informed of banking transactions, etc.

#### • JourneyJotter

Details: An app that provided people struggling with interpreting maps (Topographical Agnosia) with a detailed description of the path to their destination which they provide only as an address.

#### • HandsFreeChat

Details: Utilizing the latest Google voice-to-text API, this app provided an alternative to sending voice messages. Functioning as a finite state machine, this app enabled users to write text messages and navigate through conversations by their voice.

#### • Saramad Antivirus

Details: Saramad was an antivirus package that protected users' privacy, offering many ways to secure users against unsafe applications and social engineering. The analysis happened statically, sometimes requiring the analysis of arm-based assembly codes.

## References

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