

Mehrdad Rafiepour

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Summary

- ◆ Highly motivated researcher with 3 years of experience of conducting research in the field of natural language processing which resulted in 2 articles.
- ◆ An experienced programmer with a 5-year history of publishing successful mobile applications in a national market.
- ◆ Exceptional ability to communicate in English as demonstrated by the IELTS test, which will help to collaborate effectively with other students in the research group.

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 the Assistant Program for the Visually Impaired in Android GPA: 3.1 (out of 4)

Research Interests

- ◆ Alterations of Transformer architecture in textual data
- ◆ Dialogue systems
- ◆ Natural language understanding
- ◆ Zero and few shot learning
- ◆ Text to SQL

Publications

Publication	Citations	Year
Rafiepour, Mehrdad ; Sartakhti, Javad Salimi “CTRAN: CNN-Transformer-based network for natural language understanding” Engineering Applications of Artificial Intelligence. 2023, 126, 107013.	9	2023

Rafiepour, Mehrdad ; 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, 2021, In Farsi	-	2021
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Academic Projects

I have completed several voluntary course projects during my education. Here are some of them that are relevant to the program and involved conducting research.

- **A Transformer-Based Network for Natural Language to SQL Conversion**

Details: Centered around the implementation of a modular model mainly based on Transformers in order to generate an executable SQL query for the WikiSQL dataset. Further progress was hindered because of the lack of computational power and rather thin margins between the top models.

- **NoSQL Query Generation Using Deep Reinforcement Learning in Order to Answer Natural Language Questions**

Details: The project involved designing a pointer network model to fill up empty slots in a ElasticSearch query. The first of the two novel ideas was the introduction of a bounty reward which encouraged the model to explore the other options which were not chosen in a batch, while the second idea was separating the reward for partial and full matches.

- **Converting Multidimensional Markov Models to a Petri Model to Generate Game Maps**

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 game.

Work Experience

- ♦ **Self-employed**

2014-2019

- Published more than 10 android applications in the national market, 5 of which were extremely successful
- Responsible for all aspects of the development, the client and the server
- Learned and practically used OOP, MVP and MCP
- Hands on with Java ,PHP and Python

- ♦ **Sample Projects**

- **Hamyar**

Detail: Developed during the Software Project course, it enabled the visually impaired who only understood Farsi to use smartphones to make calls to contacts and non-contacts, be informed of their banking transactions, etc. Hamyar was essentially a finite state machine functioning as a kiosk, offering different possibilities which could be controlled by touch.

- **Saramad Antivirus**

Details: Saramad had more than 160,000 local active users during its peak. It was an antivirus package which offered ways to secure users against unsafe applications and social engineering. Most of the application analysis happened offline and it was primarily static, sometimes including the analysis of arm-based assembly codes.

- **Written Path**

Details: An app which helped people who had difficulty interpreting maps to read a detailed description of the path they should take to reach their destination, a destination which they only provide by giving an address. This was developed by the help of the Google's API.

- **Chat Without Hands**

Details: Utilizing the latest Google voice-to-text API, this app provided an alternative for people who did not want to send voice messages to send text messages instead, using the microphone.

English Proficiency

IELTS (Academic)

Overall score: 8.0

Listening: 8.5 Reading: 8.5

Writing: 8.0 Speaking: 7.5

Computer Skills

Natural Language Processing: I have worked with both Pycharm and Dataspell in my projects. My preferred framework is PyTorch for both its flexibility and popularity, although I'm able to understand the schema of networks in other frameworks as well.

Programming Languages: I am versed in both Python and Java, and I have some familiarity with MatLab, although I do prefer Python over it for experimental work.

General Knowledge: Being an entrepreneur, I was responsible for all the tasks involved in developing an application, both the server-side and the client-side, including the UX-UI. For this reason, I'm familiar with almost all intellij products and I have sufficient experience working with Ubuntu. I'm also versed in all necessary applications including but not limited to Office products, LaTeX compilers and IDEs, Photoshop, etc.

Hobbies

Cooking and finding new flavor profiles, Swimming, Finding and analyzing new trends in technology and science, Giving my cat belly rubs (completely safe)

References

available upon request.