

# Shaghayegh (Shirley) Shajarian

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## EDUCATION

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### North Carolina Agricultural and Technical State University

Jan 2023 – Anticipated Graduation: May 2026

*Ph.D. in Computer Science*; GPA: 3.92/4.0.

*Greensboro, NC*

- Courses: Deep Learning, Big Data, Machine Learning, Data Mining, and Network Security, Advanced Algorithms, Operating Systems.

### Science and Research Branch of Azad University

Sep 2016 – Aug 2019

*Master of Computer Software Engineering*; GPA: 4/4

*Tehran, Iran*

- Courses: Data Mining, Big Data Analytics, Advanced Software Engineering, Software Architecture, Advanced Operating Systems.
- Ranked 2nd in Cumulative GPA among all the Computer Engineering Students.

### University of Mazandaran

Sep 2011 – Feb 2016

*Bachelor of Computer Software Engineering*

*Babol, Iran*

- Courses: Artificial Intelligence, Data Structures, Database Management, Software Engineering, Algorithms, Network Engineering.

## EXPERIENCE

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### Graduate Research Assistant, North Carolina A&T State University, Greensboro, NC

Jan 2023 – Present

- Led research on an AI-driven framework integrating Retrieval-Augmented Generation (RAG) with Large Language Models (LLMs) to automate network log analysis, troubleshooting, and documentation; *Publication: ACM CoNEXT 2024*.
- Conducted a survey of self-running networks by reviewing 112 recent papers, analyzing opportunities and challenges, and identifying key research directions to advance the field; *Publication*.
- Collaborated with a team to review 127 relevant research papers on ML-based detection techniques and XAI approaches, analyzing current trends and providing key insights to guide future research in explainable malware analysis; *Publication*.
- Contributed to the malicious domains classification using transfer learning with ResNet50, achieving 98.67% testing accuracy; *Publication*.

### Graduate Teaching Assistant, North Carolina A&T State University, Greensboro, NC

Jan 2023 – Present

- Led biweekly recitation sessions for AI/ML and Advanced Security courses, developed course assignments, graded assignments, and provided personalized support to ensure students' comprehension of complex topics.

### Research Assistant, Distributed Systems Laboratory, Azad University, Iran

Dec 2017 – Sep 2019

- Led weekly Distributed Systems group discussions and presentations, mentored students on research methodologies, and regularly reviewed their reports to monitor progress and provide targeted feedback.

### Undergraduate Internship, Hashemi Health Center, Iran

Jun 2014 – Sep 2014

- Automated patient data analysis using R with the data analytics team, utilizing data visualization techniques with Matplotlib to present health trends, reducing reporting time by 40% and improving data accuracy.

## PROJECTS

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### Retrieval-Augmented Generation System for Document Query Answering

July 2024

- Implemented a RAG system using LangChain, FAISS, and HuggingFace Transformers to retrieve the most relevant documents for a given query, followed by generating context-aware answers.

### Predictive Analysis of Hospital Ratings Using PySpark

May 2024

- Processed a large dataset using PySpark to handle missing values and applied ML models, including Gradient Boosting using Scikit-learn, achieving an  $R^2$  score of 0.87 in predicting hospital ratings.

### Network Attack Simulation and Vulnerability Assessment

May 2024

- Developed and tested network attack simulations in an SDN environment, evaluating vulnerabilities and countermeasures.

### Malware Detection Using Convolutional Neural Networks

Dec 2023

- Applied CNNs with Keras and TensorFlow, leveraging batch normalization and dropout techniques to achieve 93% accuracy in malware detection, and tested robustness using the Fast Gradient Sign Method (FGSM) adversarial attack, resulting in a 25% drop in accuracy.

### Hint Generation System for Programming Coursework Question Assistance

May 2023

- Developed a system using BERT for multi-label classification on the Stack Overflow Code Corpus to provide relevant hints for programming questions and evaluated the model using Scikit-learn, achieving 92% accuracy in identifying relevant topics.

## TECHNICAL SKILLS

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**Languages:** Python, C++, R, HTML, CSS, PHP, SQL, MATLAB, P4

**Machine Learning Packages:** Keras, PyTorch, Tensorflow, PySpark, Matplotlib, Scikit-learn, HuggingFace Transformers

**Tools:** GIT, MySQL, LangChain, LlamaIndex, LaTeX, RYU controller framework, Cisco Packet Tracer, GNS3, Mininet, Scapy