

# REZA SHIRKAVAND

Department of Computer Science, University of Maryland, College Park, MD, USA

Email, Website, Google Scholar, Github

## RESEARCH INTERESTS

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Efficient GenAI, Machine Learning

## EDUCATION

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**Sharif University of Technology**

2015 - 2020

B.Sc in Computer Engineering

Department of Computer Engineering

**University of Pittsburgh**

2022 - 2023

M.Sc in Electrical & Computer Engineering

Research Focus: Machine Learning, Computer Vision, Medical Image Analysis

**University of Maryland**

2023 - Present

Ph.D. in Computer Science

Advisor: Heng Huang

Research Focus: Efficient GenAI, Machine Learning

## SELECTED PUBLICATIONS

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Not All Prompts Are Made Equal: Prompt-based Pruning of Text-to-Image Diffusion Models

**R. Shirkavand\***, A. Ganjdanesh\*, S. Gao, H. Huang

ICLR 2025

Bilevel ZOFO: Bridging Parameter-Efficient and Zeroth-Order Techniques for Efficient LLM Fine-Tuning and Meta-Training

**R. Shirkavand\***, Q. He, P. Yu, H. Huang

Under Review at ICML 2025

ToMoE: Converting Dense Large Language Models to Mixture-of-Experts through Dynamic Structural Pruning

S. Gao, T. Hua, **R. Shirkavand**, C. Lin, et. al

Under Review at ICML 2025

Efficient Fine-Tuning and Concept Suppression for Pruned Diffusion Models

**R. Shirkavand**, P. Yu, S. Gao, G. Somepalli, T. Goldstein, H. Huang

Under Review at CVPR 2025

From Pixels to Prose: A Large Dataset of Dense Image Captions

V. Singla, K. Yue, **R. Shirkavand**, S. Paul, et al.

Under Review

Deep Prompt Tuning for Graph Transformers

**R. Shirkavand**, H. Huang

Arxiv Preprint

Incomplete Multimodal Learning for Complex Brain Disorders Prediction

**R. Shirkavand**, L. Zhan, H. Huang, L. Shen, P.M. Thompson

Under Review at IEEE Medical Image Analysis

Dementia Severity Classification under Small Sample Size and Weak Supervision

**R. Shirkavand**, S. Ayromlou, S. Farghadani, M. Tahaei, F. Pourakpour, B. Siahlou, Z. Khodakarami, M. Rohban, M. Fatehi, H. Rabiee

Arxiv Preprint

## WORK EXPERIENCE

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**ML Researcher/Engineer**

Feb 2020 - Dec 2021

*Netbina*

Developed sentiment analysis models to help crisis management for clients, created topic detection models to identify emerging trends in news articles and tweets related to various industries, built a new multi-class classification model using convolutional neural networks, and implemented object detection models to increase the speed and accuracy of images processing.

## TEACHING EXPERIENCE

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**Co-Instructor, Advanced Machine Learning Topics**

*Spring 2024*

Presented an overview of the transformer architecture and its applications.

**Teaching Assistant, Systems & Projects Engineering**

*Summer 2022*

Taught essential topics in systems engineering and project management.

**Teaching Assistant, Algorithmic Thinking**

*Spring 2022*

Delivered lectures and supported students in developing the theoretical and practical skills necessary for designing algorithms.

**Teaching Assistant, Machine Learning**

*Fall 2019*

Supported students in gaining theoretical and practical knowledge in machine learning and statistical pattern recognition.

**Teaching Assistant, Computer Networks**

*Spring 2019*

Facilitated the design and development of network applications and the implementation of conventional network management and routing protocols for students.

**Teaching Assistant, Operating Systems**

*Fall 2018*

Guided and supported students in understanding and implementing the central concepts of operating systems through the development of a real, working, and simple kernel.

## HONORS AND AWARDS

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**Nationwide University Entrance Exam - Mathematics**

*2015*

Ranked 14th among 181000 participants

**Nationwide University Entrance Exam - Foreign Languages**

*2015*

Ranked 15th among 7000 participants

## SKILLS

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**Programming Languages**

Python, Java, C++, Matlab

**Libraries**

Pytorch, Tensorflow

**Languages**

English (Fluent) , French (Basic), Persian (Native)