# REZA SHIRKAVAND

Department of Computer Science, University of Maryland, College Park, MD, USA
Email, Website, Google Scholar, Github

## RESEARCH INTERESTS

Efficient GenAI, Machine Learning

## EDUCATION

**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

Efficient Fine-Tuning and Concept Suppression for Pruned Diffusion Models
***R. Shirkavand****, P. Yu, S. Gao, G. Somepalli, T. Goldstein, H. Huang*
CVPR 2025

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

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

**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

**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

**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) |