Ali AGHABABAEI

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Summary

I am a third-year Ph.D. student at the Université Grenoble Alpes, supervised by Professor Massih-Reza Amini. I am actively exploring a diverse range of topics within machine learning and deep learning, aiming to advance scalable AI solutions through improved model efficiency.

Education

Université Grenoble Alpes *2023 - Present*
Ph.D. in Computer Science
- **Research:** Efficient Machine Learning

Sharif University of Technology *2018 – 2022*
M.Sc. in Computer Science
- **Coursework:** Deep Learning, Speech Processing

University of Tehran *2013 – 2018*
B.Sc. in Electrical Engineering
- **Coursework:** Linear Algebra, Pattern Recognition, Digital Signal Processing

Research Interests

Efficient Deep Learning
- Tensor Decomposition
- Knowledge Distillation
- Model Pruning

Inverse Problems
- Image Denoising
- Image Super Resolution
- MRI and CT Imaging

Generative AI
- Diffusion Generative AI
- Image Reconstruction
- Image Manipulate

Research Experience

Ph.D. Thesis *2023 - Present*
APTIKAL team
- Developed an innovative approach to reduce computational complexity and parameters of deep learning models using tensor decomposition techniques.
- Designed a constraint-based loss function to identify optimal tensor decomposition ranks for pre-trained models, enhancing model efficiency while preserving accuracy.
- Investigated the effectiveness of the proposed method in optimizing Vision Transformer (ViT) models for improved efficiency and performance.

Research Collaborator *2021 – 2022*
University of Basel
- Conducted analysis of inverse problems, including image denoising, limited-view computed tomography (CT), and wave scattering, utilizing invertible neural networks.
- Approximate data distribution with normalizing flow to identify out-of-distribution samples, improving model robustness and reliability.

M.Sc. Thesis *2018 – 2021*
Electronic Research Institute

- Proposed a patch-wise feature analysis approach for identifying forgery in video frames, aimed at enhancing deepfake detection capabilities.
- Developed a straightforward method to enhance the generalization and robustness of deepfake detection models.

B.Sc. Thesis *2016 – 2017*
University of Tehran

- Designed and implemented a video quality meter to assess video quality in terms of blockiness and blurriness distortions in a no-reference mode.

Publications

Unified Framework for Neural Network Compression via Decomposition and Optimal Rank Selection Oct 2024
Ali Aghababaei-Harandi, Massih-Reza Amini
arxiv.org/pdf/2409.03555

Deep variational inverse scattering Mar 2023
AmirEhsan Khorashadizadeh, ***Ali Aghababaei-Harandi***, Tin Vlašić, Hieu Nguyen, Ivan Dokmanić
European Conference on Antennas and Propagation

Conditional injective flows for Bayesian imaging Feb 2023
AmirEhsan Khorashadizadeh, Konik Kothari, Leonardo Salsi, ***Ali Aghababaei-Harandi***, Maarten de Hoop, Ivan Dokmanić
IEEE Transactions on Computational Imaging

Skills

Programming Tools: Python, Pytorch, Tensorflow, Java

Theoretical: Pattern Recognition, Design and Analysis of Algorithms, Creative Problem Solving