Sahar Rahimi Malakshan

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Third-year Ph.D. student; interested in Deep Learning, Machine Learning, Computer Vision, applications in Biometrics and health science.

Education

West Virginia University — *Morgantown, USA*
Ph.D. in Electrical Engineering (GPA: 4.0/4.0) — *Aug 2021 - Current*
- **Courses:** Deep Learning, Computer Vision, Application of Neural Networks, Stochastic System Theory, Pattern Recognition, Natural Language Processing Specialization (Coursera)

K. N. Toosi University of Technology — *Tehran, Iran*
M.Sc. in Biomedical Engineering (GPA: 4.0/4.0) — *Sep 2017 - Sep 2020*

K. N. Toosi University of Technology — *Tehran, Iran*
B.Sc. in Electrical Engineering (GPA: 3.5/4.0) — *Sep 2012 - Sep 2016*

Selected Papers

For a complete list of publications please refer to (Google scholar link).

[1] Joint Super-Resolution and Head Pose Estimation for Extreme Low-Resolution Faces, *In IEEE Access, 2023.*

[2] Deep boosting multi-modal ensemble face recognition with sample-level weighting, *In IJCB, 2023.*

[3] A Quality Aware Sample-to-Sample Comparison for Face Recognition, *In WACV, 2023.*

[4] Hyperspherical Classification with Dynamic Label-to-Prototype Assignment, *In CVPR, 2024.*

Skills

- **Technical Skills**:
  - Proficient in Python programming for data analysis, visualization, and machine learning/deep learning applications.
  - Familiar with SQL for comprehensive database management, R programming for advanced data analysis, AWS SageMaker and S3 for streamlined data preprocessing and model deployment and Dataiku for end-to-end AI and machine learning projects, encompassing data preparation, modeling, and deployment. Proficient in LaTeX for precise document preparation and scientific writing.
  - Familiar with biomedical image and signal processing tools, including FreeSurfer, EEGLab, FSL, and DtiStudio, as utilized in my master's thesis.
- **Soft Skills**:
  - Problem-Solving: Demonstrated creativity in problem-solving across various projects.
  - Communication: Strong verbal and written skills, evidenced by presentations at academic meetings, poster sessions, and publications in peer-reviewed journals and conference proceedings.

Recent projects

- **Long Range Face Recognition**: Supported by the Intelligence Advanced Research Projects Activity (IARPA), contributed to presentations and PI review meetings for the IARPA-Biometric Recognition and Identification at Altitude and Range (BRIAR) program in Spring 2022, Fall 2022, Spring 2023, and Fall 2023. These efforts led to the publication of three papers, presented at two IEEE International Joint Conference on Biometrics (IJCB) conferences and one Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), detailing advancements in real-world face recognition.
- **Head Pose Estimation and Profile-to-Frontal Face Recognition**: Supported by the Office of the Director of National Intelligence (ODNI), conducted research resulting in one published paper presented at the IEEE International Joint Conference on Biometrics (IJCB) focusing on profile-to-frontal face recognition techniques. Additionally, authored another paper published in the IEEE Access journal covering challenges in head pose estimation for extremely low-resolution images.
- **Functional and Structural human brain changes**: Developed a model that integrates EEG data and MR images for analyzing age-related changes in the adult brain cortex. This work led to the publication of a research paper in the PLoS ONE journal and a review paper in the Reviews in the Neurosciences journal, showcasing significant findings in both venues.
- **Metric Space Utilization**: Developed a novel method for dynamic optimization of prototype categories during deep learning training, enhancing metric space utilization. Our approach, which diverges from traditional static methods, employs a two-step optimization process involving network parameters and label-to-prototype mapping. This method demonstrated improvements in both balanced and long-tail classification tasks across various architectures, resulting in a paper accepted at the IEEE Conference on Computer Vision and Pattern Recognition (CVPR).
- **Efficient Dataset Condensation**: Currently exploring a straightforward and efficient technique for dataset condensation to reduce the computational burden of training sophisticated deep learning models. This involves substituting extensive training datasets with smaller, synthetic counterparts. Our ongoing research is scheduled for submission to forthcoming conferences.