Salman Mohamadi

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salmanportal.github.io/

Research Experience

- **Deep Learning Research Lab** — West Virginia University
  Graduate Research Assistant — *May 2020 - Present*
  - Executed various SOTA deep learning generative models including various GAN models (Cycle GAN, Pix2pix, Conditional GAN, SRGAN, STARGAN) for image and time series datasets
  - Developed a deep active learning model for data efficient classification on image data
  - Developed a new model for self supervised representation learning for datasets at different scales, from CIFAR10/100 to ImageNet
  - Developed multiple time series analysis and modeling framework for human genome sequences, age estimation using gene exppression data, age-related gene identification

- **Computer Vision Biometrics Research Lab** — West Virginia University
  Graduate Research — *May 2019 - May 2020*
  - Developed a GAN-based model to simultaneously perform super-resolution and domain translation on Iris image data for identification purposes.

- **Advance Signal Processing Research Lab** — Amirkabir University of Technology
  Graduate Research Assistant — *Aug. 2014 - May 2019*
  - Thorough investigation of time series prediction methods for non-stationary time series using Wavelet, and AR, MA, and ARIMA modeling
  - Developing an accurate algorithm to process human and canine EEG signals for long term prediction of epileptic seizures up to one hour prior to the seizure onset
  - Developing a linear-non-linear modeling algorithm for modeling highly volatile time series

Education

- **West Virginia University** — Morgantown, WV
  Doctor of Philosophy in Electrical Engineering *[Deep/Machine Learning] GPA: 4.0* — *May 2019 – December 2023*
  - Title: Active Uncertainty Representation Learning—Learning More From Less
  (Advised by Dr. Donald Adjeroh and Dr. Gianfranco Doretto)

Selected Publications

- **Salman Mohamadi, Gianfranco Doretto, Donald Adjeroh**: "FUSSL: Fuzzy Uncertain Self-Supervised Learning" 2023 IEEE/CVF Winter Conference on Application of Computer Vision (**WACV 2023**), Jan. 2023
- **Salman Mohamadi, Gianfranco Doretto, Donald Adjeroh**: "Deep Active Ensemble Sampling" 2022 IEEE/CVF Asian Conference on Computer Vision (**ACCV 2022**), Dec. 2022
- **Moktari Mostofa, Salman Mohamadi, Nasser M Nasrabadi**: "Deep GAN-based Cross-Spectral Cross-Resolution Iris Recognition" (**IEEE Transaction 2021**)
- **Salman Mohamadi, Donald Adjeroh**: "An Information-Theoretic Framework for Identifying Age-Related Genes Using Human Dermal Fibroblast Transcriptome Data" 2021 IEEE International Conference on Bioinformatics and Biomedicine (**BIBM 2021**)
- **Salman Mohamadi, Gianfranco Doretto, Nasser Nasrabadi, Donald Adjeroh**: "Human Age Estimation from Gene Expression Data Using Artificial Neural Networks" 2021 IEEE International Conference on Bioinformatics and Biomedicine (**BIBM 2021**)
- **Salman Mohamadi, Donald Adjeroh**: "A New Framework For Spatial Modeling And Synthesis of Genomic Sequences" 2020 IEEE International Conference on Bioinformatics and Biomedicine (**BIBM 2020**), 3575-3584. , 16 June, 2020
- **Salman Mohamadi, Hamidreza Amindavar**: "ARIMA-GARCH Modeling For Epileptic Seizure Prediction" 2017 IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP 2017**)"
- **Salman Mohamadi, Gianfranco Doretto, Donald Adjeroh**: "More Synergy, Less Redundancy: Exploiting Joint Mutual Information for Self-Supervised Learning" Recently submitted to *ICASSP 2023*
- **Salman Mohamadi, Gianfranco Doretto, Donald Adjeroh**: "GUESS: Generative Uncertainty Ensemble For Self-Supervision", CVPR 2023, Efficient Deep Learning for Computer Vision Workshop

Current Research

- **Active and self-supervised visual feature learning**
  More robust SSL and AL models
  - We re-consider uncertainty representation for AL and SSL models

- **Generative Models, i.e., VAE, 3D & 2D GAN**
  Adversarial synthesis
  - Investigation of deep generative models that represent 3D scenes in neural radiance fields as well as 2D scenes
  - 3D model for self supervised learning

Projects/Expertise

- **Uncertainty Representation for Machine and Deep Learning**: Including Approximate Thompson Sampling for Active Learning;Uncertainty Representation for Self-Supervised Learning (SSL); Joint Mutual Information Decomposition for SSL
- **GAN Models**: Implemented various GAN models [STAR, CYCLE, VANILLA, Pix2pix, Conditional, etc] for Quality enhancement, and various image synthesis applications
- **Signal and Times Series Modeling**: Long-Term Epileptic Seizure Prediction using ARIMA models, Wavelet and etc; Modeing signals with high volatility

Leadership/ Awards

- **NSF Fellowship**: NSF fellowship (Bridges Digital Health NSF NRT Fellowships , 2 years with Stipends)
- **Supervision**: Supervised graduate and undergraduate students in research topics under Electrical Engineering and Computer Science
- **Reviewer**: IEEE Access, Neural Network (Elsevier), IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) , IJCB conference, etc

Research Interests

- **General**: Machine Learning (ML), Deep Learning (DL), Computer Vision, and Their application with Bioinformatics
- **Specific**: Generative Models (GANs, VAEs), Uncertainty Representation in Deep Learning, Self-Supervised Learning, and Active Learning
- **Others**: Getting machines to learn **hierarchical representation of action plans** (as opposed to hierarchical representation of perception which is in part solved by deep learning

Programming Skills

- **Platforms:** PyTorch, Tensorflow, PyCharm, TorchScript, MATLAB, Linux, Kinect-SDK
- **Languages:** Python, C#, C/C++