Sobhan SOLEYMANI

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Ph.D. in Computer Vision, Machine Learning, Deep Learning, and their applications in Biometrics

EDUCATION

MAY '21	**West Virginia University**, Ph.D. in ELECTRICAL ENGINEERING	*Morgantown, WV, USA*
MAR '09	**École Polytechnique Fédérale de Lausanne**, M.Sc. in ELECTRICAL & ELECTRONICS ENGINEERING	*Lausanne, Switzerland*
JULY '07	**University of Tehran**, B.Sc. in ELECTRICAL ENGINEERING	*Tehran, Iran*

CURRENT POSITION

SEPT '21–Present	**Postdoctoral Fellow**, West Virginia University	*Morgantown, WV, USA*

EXPERTISE

Image-to-image translation: Knowledge of generative adversarial networks, variational autoencoders, and mutual information maximization.

- Designed an unsupervised image-to-image translation using domain-specific variational information bound.
- Designed sketch-to-photo synthesis frameworks enhanced by facial attaributes.

Adversarial Examples: Knowledge on crafting adversarial examples, iterative data generation, and studying loss landscape in the vicinity of natural and adversarial samples.

- Designed an adversarial attack capable of modifying frequency representations of input image.
- Exploiting joint robustness to adversarial perturbations by analysing the interaction between members of an ensemble.
- Altering geometric structure of the face to craft adversarial examples.
- Crafting adversarial iris samples through designing a surrogate network and defending against them using an ensemble of autoencoders to learn the distribution of wavelet sub-bands.

Biometrics: Knowledge on face, iris, fingerprint, and speech processing using Tensorflow and PyTorch.

- Designed several multimodal architectures for multimodal biometric recognition.
- Optimized a mutual information maximization problem on disentangled representations for differential morph detection.
- Designed a prosodic-enhanced networks for cross-device text-independent speaker verification

Alleviating overfitting: Knowledge of data augmentation, mixing augmentation, and knowledge distillation.

- Improving the performance of the mixing augmentation using a supervision of a teacher model to identify salient regions.

PAPERS UNDER SUBMISSION

[3] Adversarially-Trained Equivariant Single-View 3D Reconstruction, **Soleymani**, Dabouei, Dawson, Nasrabadi.
[2] Benchmarking Human Face Similarity Using Identical Twins, McCauley, **Soleymani**, Nasrabadi, Dawson, *IET Biometrics*.
[1] Real-time Texture-adaptive Redundant DWT Watermarking Using Short-SURF Descriptors, **Soleymani**, Noore, Nasrabadi.

PUBLICATIONS

[33] Quality-Aware Attention Mechanism for Multimodal Biometric Recognition, **Soleymani**, Dabouei, Iranmanesh, Dawson, Nasrabadi, *IEEE Transactions on Biometrics, Behavior, and Identity Science,* 2021.
[32] SuperMix: Supervising the Mixing Data Augmentation, Dabouei, **Soleymani**, Taherkhani, Nasrabadi, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
[31] Self-Supervised Wasserstein Pseudo-Labeling for Semi-Supervised Image Classification, Taherkhani, Dabouei, **Soleymani**, Dawson, Nasrabadi, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
[30] Adversarially Perturbed Wavelet-based Morphed Face Generation, O'Haire, **Soleymani**, Aghdaie, Chaudhary, Nasrabadi. *IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, 2021.
[29] Identical Twins as a Facial Similarity Benchmark for Human Facial Recognition, McCauley, **Soleymani**, Williams, Dando, Nasrabadi, Dawson. *IEEE 20th International Conference of the Biometrics Special Interest Group (BIOSIG)*, 2021.
[28] Attention Aware Wavelet-based Detection of Morphed Face Images, Aghdaie, Chaudhary, **Soleymani**, Dawson, Nasrabadi. *IEEE Int. Joint Conference on Biometrics (IJCB)*, 2021.
[27] Morph Detection Enhanced by Structured Group Sparsity, Aghdaie, Chaudhary, **Soleymani**, Nasrabadi. *IEEE Winter Conference on Applications of Computer Vision (WACVW)*, 2022.
[26] Differential Morph Face Detection using Discriminative Wavelet Sub-bands, Chaudhary, Aghdaei, **Soleymani**, Dawson, Nasrabadi, *IEEE Computer Vision and Pattern Recognition Workshop (CVPRW),* 2021.
[25] Detection of Morphed Face Images Using Discriminative Wavelet Sub-bands, Aghdaei, Chaudhary, **Soleymani**, Dawson, Nasrabadi, *IEEE International Workshop on Biometrics and Forensics (IWBF),* 2021.

[24] Mutual Information Maximization on Disentangled Representations for Differential Morph Detection, **Soleymani**, Dabouei, Taherkhani, Dawson, Nasrabadi, *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2021.
[23] Differential Morphed Face Detection Using Deep Siamese Networks, **Soleymani**, Chaudhary, Dabouei, Dawson, Nasrabadi, *MultiMedia FORensics in the WILD (MMForWILD)*, 2020.
[22] Transporting Labels via Hierarchical Optimal Transport for Semi-Supervised Learning, Taherkhani, Dabouei, **Soleymani**, Dawson, Nasrabadi, *European Conference on Computer Vision (ECCV)*, 2020.
[21] Exploiting Joint Robustness to Adversarial Perturbations, Dabouei, **Soleymani**, Taherkhani, Dawson, Nasrabadi, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020.
[20] SmoothFool: An Efficient Framework for Computing Smooth Adversarial Perturbations, Dabouei, **Soleymani**, Taherkhani, Dawson, Nasrabadi, *IEEE Winter Conference on Applications of Computer Vision (WACV), 2020*.
[19] Boosting Deep Face Recognition via Disentangling Appearance and Geometry, Dabouei, Taherkhani, **Soleymani**, Dawson, Nasrabadi, *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2020.
[18] Robust Facial Landmark Detection via Aggregation on Geometrically Manipulated Faces, Iranmanesh, Dabouei, **Soleymani**, Nasrabadi, *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2020.
[17] Defending Against Adversarial Iris Examples Using Wavelet Decomposition, **Soleymani**, Dabouei, Dawson, Nasrabadi, *IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS)*, 2019.
[16] Adversarial Examples to Fool Iris Recognition Systems, **Soleymani**, Dabouei, Dawson, Nasrabadi, *IAPR International Conference on Biometrics (ICB)*, 2019.
[15] Learning to Authenticate with Deep Multibiometric Hashing and Neural Network Decoding, Talreja, **Soleymani**, Valenti, Nasrabadi, *IEEE International Conference on Communications (ICC)*, 2019.
[14] Fast Geometrically-perturbed Adversarial Faces, Dabouei, **Soleymani**, Dawson, Nasrabadi, *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2019.
[13] Deep Contactless Fingerprint Unwarping, Dabouei, **Soleymani**, Dawson, Nasrabadi, *IAPR International Conference on Biometrics (ICB)*, 2019.
[12] Multi-Level Feature Abstraction from Convolutional Neural Networks for Multimodal Biometric Identification, **Soleymani**, Dabouei, Kazemi, Dawson, Nasrabadi, *International Conference on Pattern Recognition (ICPR)*, 2018.
[11] Generalized bilinear deep convolutional neural networks for multimodal biometric identification, **Soleymani**, Torfi, Dawson, Nasrabadi, *IEEE International Conference on Image Processing (ICIP)*, 2018.
[10] Prosodic-Enhanced Siamese Convolutional Neural Networks for Cross-Device Text-Independent Speaker Verification, **Soleymani**, Dabouei, Iranmanesh, Kazemi, Dawson, Nasrabadi, *IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS)*, 2018.
[9] Unsupervised image-to-image translation using domain-specific variational information bound, Kazemi, **Soleymani**, Taherkhani, Iranmanesh, Dawson, Nasrabadi, *Advances in Neural Information Processing Systems (NeurIPS)*, 2018.
[8] ID Preserving GAN for Partial Latent Fingerprint Reconstruction, Dabouei, **Soleymani**, Kazemi, Dawson, Nasrabadi, *IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS)*, 2018.
[7] Deep sketch-photo face recognition assisted by facial attributes, Iranmanesh, Kazemi, **Soleymani**, Dabouei, Nasrabadi, *IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS)*, 2018.
[6] Facial Attributes Guided Deep Sketch-to-Photo Synthesis, Kazemi, Iranmanesh, Dabouei, **Soleymani**, Nasrabadi *IEEE Winter Applications of Computer Vision Workshops (WACVW)*, 2018.
[5] Attribute-Centered Loss for Soft-Biometrics Guided Face Sketch-Photo Recognition, Kazemi, **Soleymani**, Dabouei, Iranmanesh, Nasrabadi, *IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2018.
[4] On the construction of polar codes for achieving the capacity of marginal channels, Torfi, **Soleymani**, Aram, Vakili, *IEEE Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, 2017.
[3] Polar coding for achieving the capacity of marginal channels in nonbinary-input setting, Torfi, **Soleymani**, Iranmanesh, Kazemi, Shirvani, Vakili, *IEEE Annual Conference on Information Sciences and Systems (CISS)*, 2017.
[2] Dynamically reconfigurable evolutionary multi-context robust cellular array design, **Soleymani**, Noore, *International Journal of Circuits and Architecture Design*, 2016.
[1] Efficient high-quality demosaicing using spatially adaptive weighting, Kenarsari-Anhari, Bakhtiary-Davijani, Nasiri-Avanaki, **Soleymani**, *International Symposium on Signal Processing and Its Applications*, 2007.

Awards

[3] Best Poster Award in IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS), 2019.
[2] Best Poster Award in IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS), 2018.
[1] Best Student Paper Award in IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS), 2018.

Services

[2] Reviewer: IEEE TNNLS, IEEE TBIOM, IEEE TIM, NeurIPS, ICLR, IEEE J. of Selected Topics in Signal Processing, IEEE Signal Processing Letters, IEEE Sensors Journal, IEEE Access, CVIU, WACV, ICIP, and IJCB.
[1] Graduate Teaching Assistant (WVU): Introduction to Electrical Engineering Laboratory, Electrical Circuits Laboratory, and Digital Electronics Laboratory.

Internships

[2] 3D Model Processing for Automated Image Annotation, Supervisors: Dr. Luciano Sbaiz, Dr. Pascal Fua, *École Polytechnique Fédérale de Lausanne*, Lausanne, Switzerland, 2008.
[1] Real-time Gaze Tracking Using Webcam Videos, Supervisors: Dr. Matteo Sorci, Dr. Jean-Philippe Thiran, *École Polytechnique Fédérale de Lausanne*, Lausanne, Switzerland, 2009.