




# Sobhan SOLEYMANI

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 sbns1

Ph.D. in Electrical Engineering with more than six years of research experience in computer vision, machine learning, deep learning, signal and image processing, and their applications in biometrics. Selected Publications: TBIOM, NeurIPS, 3×CVPR, ECCV, 5×WACV, ICPR.

## EDUCATION

- MAY'21 PH.D. in ELECTRICAL ENGINEERING, West Virginia University, Morgantown, WV, USA  
Dissertation: Deep Models for Improving the Performance and Reliability of Person Recognition  
Advisor: Dr. Nasser M. Nasrabadi
- MAR'09 M.SC. in ELECTRICAL & ELECTRONICS ENGINEERING, École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland  
Thesis: Tomographic Field Reconstruction Using a Mobile Sensor Network  
Advisors: Dr. Martin Vetterli and Dr. Yue M. Lu
- JULY'07 B.SC. in ELECTRICAL ENGINEERING, COMMUNICATIONS, University of Tehran, Tehran, Iran  
Thesis: Modeling Optical Coherence Tomography Using Fourier Optics

## CURRENT POSITION

- SEPT.'21–Present Postdoctoral Fellow, West Virginia University, Morgantown, WV, USA
- Generation and detection of morphed face images
  - Off-angle, view-invariant, and low-resolution face recognition

## EXPERTISE

**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.
- Exploited joint robustness to adversarial perturbations by analysing the interaction between members of an ensemble.
- Altered geometric structure of the face to craft adversarial examples.
- Crafted 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.

**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 attributes.

**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.

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

## PUBLICATIONS

[submitted] Adversarially-Trained Equivariant Single-View 3D Reconstruction, **Soleymani**, Dabouei, Dawson, Nasrabadi.

[submitted] Benchmarking Human Face Similarity Using Identical Twins, McCauley, **Soleymani**, Nasrabadi, Dawson.

[submitted] Real-time Texture-adaptive Redundant DWT Watermarking Using Short-SURF Descriptors, **Soleymani**, Noore, Nasrabadi.

2021 [33] [Quality-Aware 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] 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.
- [29] Adversarially Perturbed Wavelet-based Morphed Face Generation, O'Haire, **Soleymani**, Aghdaie, Chaudhary, Nasrabadi. *IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, 2021.
- [28] 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.
- [27] Attention Aware Wavelet-based Detection of Morphed Face Images, Aghdaie, Chaudhary, **Soleymani**, Dawson, Nasrabadi. *IEEE Int. Joint Conference on Biometrics (IJCB)*, 2021.
- [26] Morph Detection Enhanced by Structured Group Sparsity, Aghdaie, Chaudhary, **Soleymani**, Nasrabadi. *IEEE Winter Conference on Applications of Computer Vision (WACVW)*, 2022.
- [25] Differential Morph Face Detection using Discriminative Wavelet Sub-bands, Chaudhary, Aghdaei, **Soleymani**, Dawson, Nasrabadi, *IEEE Computer Vision and Pattern Recognition Workshop (CVPRW)*, 2021.
- [24] Detection of Morphed Face Images Using Discriminative Wavelet Sub-bands, Aghdaei, Chaudhary, **Soleymani**, Dawson, Nasrabadi, *IEEE International Workshop on Biometrics and Forensics (IWBF)*, 2021.
- 2020 [23] Exploiting Joint Robustness to Adversarial Perturbations, Dabouei, **Soleymani**, Taherkhani, Dawson, Nasrabadi, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 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] Differential Morphed Face Detection Using Deep Siamese Networks, **Soleymani**, Chaudhary, Dabouei, Dawson, Nasrabadi, *MultiMedia FORensics in the WILD (MMForWILD)*, 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.
- 2019 [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] Fast Geometrically-perturbed Adversarial Faces, Dabouei, **Soleymani**, Dawson, Nasrabadi, *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2019.
- [14] Learning to Authenticate with Deep Multibiometric Hashing and Neural Network Decoding, Talreja, **Soleymani**, Valenti, Nasrabadi, *IEEE International Conference on Communications (ICC)*, 2019.
- [13] Deep Contactless Fingerprint Unwarping, Dabouei, **Soleymani**, Dawson, Nasrabadi, *IAPR International Conference on Biometrics (ICB)*, 2019.
- 2018 [12] 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.
- [11] Multi-Level Feature Abstraction from Convolutional Neural Networks for Multimodal Biometric Identification, **Soleymani**, Dabouei, Kazemi, Dawson, Nasrabadi, *International Conference on Pattern Recognition (ICPR)*, 2018.
- [10] Generalized bilinear deep convolutional neural networks for multimodal biometric identification, **Soleymani**, Torfi, Dawson, Nasrabadi, *IEEE International Conference on Image Processing (ICIP)*, 2018.
- [9] 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.
- [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.
- 2017 [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.

## INTERNSHIPS

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[2] Real-time Gaze Tracking Using Webcam Videos, Supervisors: Dr. Matteo Sorci, Dr. Jean-Philippe Thiran, *École Polytechnique Fédérale de Lausanne*, Lausanne, Switzerland, 2009.

[1] 3D Model Processing for Automated Image Annotation, Supervisors: Dr. Luciano Sbaiz, Dr. Pascal Fua, *École Polytechnique Fédérale de Lausanne*, Lausanne, Switzerland, 2008.

## AWARDS

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[4] Best Poster Award in IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS), 2019.

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

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

[1] Best Paper Award in IEEE Winter Applications of Computer Vision Workshops, 2018.

## SERVICE

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[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.