

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.

## EDUCATION

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

## CURRENT POSITION

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| SEPT.'21–Present | Postdoctoral Fellow, West Virginia University, Morgantown, WV, USA <ul style="list-style-type: none"> <li>• Generation and detection of morphed face images</li> <li>• Off-angle, view-invariant, and low-resolution face recognition</li> </ul> |
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## 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

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|      | [submitted] Adversarially-Trained Equivariant Single-View 3D Reconstruction, <b>Soleymani</b> , Dabouei, Dawson, Nasrabadi.  |
|      | [submitted] Benchmarking Human Face Similarity Using Identical Twins, McCauley, <b>Soleymani</b> , Nasrabadi, Dawson.  |
|      | [submitted] Real-time Texture-adaptive Redundant DWT Watermarking Using Short-SURF Descriptors, <b>Soleymani</b> , Noore, Nasrabadi.   |
| 2021 | [33] <a href="#">Quality-Aware Multimodal Biometric Recognition</a> , <b>Soleymani</b> , Dabouei, Iranmanesh, Dawson, Nasrabadi, <i>IEEE Transactions on Biometrics, Behavior, and Identity Science</i> , 2021.  |
|      | [32] <a href="#">SuperMix: Supervising the Mixing Data Augmentation</a> , Dabouei, <b>Soleymani</b> , Taherkhani, Nasrabadi, <i>Conference on Computer Vision and Pattern Recognition (CVPR)</i> , 2021.   |
|      | [31] <a href="#">Self-Supervised Wasserstein Pseudo-Labeling for Semi-Supervised Image Classification</a> , Taherkhani, Dabouei, <b>Soleymani</b> , Dawson, Nasrabadi, <i>Conference on Computer Vision and Pattern Recognition (CVPR)</i> , 2021.                 |
|      | [30] <a href="#">Mutual Information Maximization on Disentangled Representations for Differential Morph Detection</a> , <b>Soleymani</b> , Dabouei, Taherkhani, Dawson, Nasrabadi, <i>IEEE Winter Conference on Applications of Computer Vision (WACV)</i> , 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.
- [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.
- 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] 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.

## 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.