2019 IEEE 5th International Conference on Identity, Security, and Behavior Analysis (ISBA 2019)

Hyderabad, India 22 – 24 January 2019



IEEE Catalog Number: ISBN:

CFP19A05-POD 978-1-7281-0533-8

Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP19A05-POD

 ISBN (Print-On-Demand):
 978-1-7281-0533-8

 ISBN (Online):
 978-1-7281-0532-1

ISSN: 2640-5555

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



ISBA 2019 Proceedings - Table of Contents

Iris Recognition I

Super-Resolution and Image Re-projection for Iris Recognition....1

Eduardo F Ribeiro (University of Salzburg) Andreas Uhl (University of Salzburg) Fernando Alonso-Fernandez (Halmstad University)

Spoofing PRNU Patterns of Iris Sensors while Preserving Iris Recognition.....8

Sudipta Banerjee (Michigan State University) Vahid Mirjalili (Michigan State University) Arun Ross (Michigan State University)

Towards Reducing the Error Rates in Template Protection for Iris Recognition Using Custom Cuckoo Filters...18 *Kiran Raja (USN) Raghavendra Ramachandra (NTNU) Christoph Busch (Norwegian University of Science and Technology)*

Biometrics and Security I

FDFNet: A Secure Cancelable Deep Finger Dorsal Template Generation Network Secured via. Bio-Hashing...26

Avantika Singh (IIT Mandi) Ashish Arora (Indian Institute of Technology Dharwad) Shreya Hasmukh Patel (IIT Jodhpur) Gaurav Jaswal (IIT Mandi) Aditya Nigam (IIT Mandi)

Subband Analysis for Performance Improvement of Replay Attack Detection in Speaker Verification Systems...35

Shruti Bhilare (IIT Indore) Sachin Garg (IIT Indore) Vivek Kanhangad (IIT Indore)

Towards making morphing attack detection robust using hybrid scale-space colour texture features.....42Raghavendra Ramachandra (NTNU) Sushma Venkatesh (NTNU) Kiran Raja (NTNU) Christoph Busch (Norwegian University of Science and Technology)

Hand-based Biometrics

Enhanced Segmentation-CNN based Finger-Vein Recognition by Joint Training with Automatically Generated and Manual Labels.....50

Ehsaneddin Jalilian (University of Salzburg) Andreas Uhl (University of Salzburg)

PVSNet: Palm Vein Authentication Siamese Network Trained using Triplet Loss and Adaptive Hard Mining by Learning Enforced Domain Specific Features.....58

Gaurav Jaswal (IIT Mandi) Daksh Thapar (IIT Mandi) Aditya Nigam (IIT Mandi) Vivek Kanhangad (IIT Indore)

Deep Convolutional Neural Network for Dot and Incipient Ridge Detection in High-resolution Fingerprints.....66 *Vijay Anand (IIT Indore) Vivek Kanhangad (IIT Indore)*

FDSNet: Finger dorsal image spoof detection network using light field camera.....72

Avantika Singh (IIT Mandi) Gaurav Jaswal (IIT Mandi) Aditya Nigam (IIT Mandi)

Face Recognition

Thermal to Visual Face Recognition using Transfer Learning.....81

Yaswanth Gavini (University of Hyderabad) Babu Mehtre (IDRBT) Arun Agarwal (University of Hyderabad Utilizing Template Diversity for Fusion of Face Recognizers.....89

Sergey Tulyakov (University at Buffalo, SUNY) Nishant Sankaran (University at Buffalo, SUNY) Srirangaraj Setlur (University at Buffalo, SUNY) Venu Govindaraju (University at Buffalo, SUNY)

System and Security

Utilization of HOG-SVD based Features with Connected Component Labeling for Multiple Copy-move Image Forgery Detection.....96

Anuja Dixit (IIT/ISM Dhanbad) Soumen Bag (IIT/ISM Dhanbad)

Removing Personally Identifiable Information from Shared Dataset for Keystroke Authentication Research...105

Jiaju Huang (Clarkson University) Bryan Klee (Clarkson University) Daniel Schuckers (St. Lawrence University)

Daging Hou (Clarkson University) Stephanie Schuckers (Clarkson University)

Biometric based User Authentication Protocol for Mobile Cloud Environment.....112

Manojkumar Vivekanandan (NIT Trichy and IDRBT) Sastry V. N (IDRBT) Srinivasulu Reddy (NIT, Trichy)

Behavioral Analysis

User Behavior Profiling using Ensemble Approach for Insider Threat Detection.....118

Malvika Singh (NIT Trichy) Babu Mehtre (IDRBT) Sangeetha S. (NIT Trichy)

Forensic Performance on Handwriting to Identify Forgery Owing to Word Alteration.....126

Priyanka Roy (IIT/ISM Dhanbad) Soumen Bag (IIT/ISM Dhanbad)

An Efficient Online Signature Verification Based on Feature Fusion and Interval Valued Representation of Writer Dependent Features.....135

Chandra V Sekhar (Indian Institute of Information Technology, SriCity)