

ICB 2019 PROGRAM

Oral Presentations

ID	Session 1	Focus: Face Recognition	
		Title	Authors
33	1	Recognition from Sequential Sparse 3D Data via Deep Registration	Yang Tan (Sun Yat-sen University)*; Hongxin Lin (Sun Yat-sen University); Zelin Xiao (Sun Yat-sen University); Shengyong Ding (Pixtalks Tech); Hongyang Chao (Sun Yat-sen University)
59	2	Occlusion-guided compact template learning for ensemble deep network-based pose-invariant face recognition	Yuhang Wu (University of Houston); Ioannis Kakadiaris (University of Houston)*
64	3	FLDet: A CPU Real-time Joint Face and Landmark Detector	zhuang chubin (NLPR, CASIA, UCAS)*; Shifeng Zhang (CBSR, NLPR, CASIA); Zhen Lei (NLPR, CASIA, China); Xiangyu Zhu (Chinese Academy of Science); Jinqiao Wang (Institute of Automation, Chinese Academy of Sciences)
128	4	Learning Lightweight Face Detector with Knowledge Distillation	Haibo Jin (AuthenMetric Inc.)*; Shifeng Zhang (CBSR, NLPR, CASIA); Xiangyu Zhu (Chinese Academy of Science); Yinhang Tang (AuthenMetric Inc.); Zhen Lei (NLPR, CASIA, China)
123	5	Likelihood Ratio based Loss to fine tune CNNs for Very Low Resolution Face Verification	Dan Zeng (University of Twente)*; Raymond Veldhuis (University of Twente); Luuk Spreeuwers (University of Twente); Qijun Zhao (Sichuan University)

ID	Session 2	Focus: Anti-spoofing	
		Title	Authors
95	1	Multi-Modal Fingerprint Presentation Attack Detection: Analysing the Surface and the Inside	Marta Gomez-Barrero (Hochschule Darmstadt)*; Jascha Kolberg (Hochschule Darmstadt); Christoph Busch (Hochschule Darmstadt)
130	2	RoPAD: Robust Presentation Attack Detection through Unsupervised Adversarial Invariance	Ayush Jaiswal (University of Southern California)*; Shuai Xia (University of Southern California); Iacopo Masi (University of Southern California); Wael Abd-Almageed (Information Sciences Institute)
156	3	Deep Pixel-wise Binary Supervision for Face Presentation Attack Detection	Anjith George (Idiap Research Institute)*; Sebastien Marcel (Idiap Research Institute)
175	4	Face Anti-spoofing using Hybrid Residual Learning Framework	USMAN MUHAMMAD (University of Chinese Academy of Sciences); Usman Muhammad (University of Oulu)*; Abdenour Hadid (Finland)
195	5	Crafting A Panoptic Face Presentation Attack Detector	Suril S Mehta (IIITD); Anannya Uberoi (IIIT Delhi); Akshay Agarwal (IIIT Delhi); Mayank Vatsa (IIIT-Delhi); Richa Singh (IIIT-Delhi)*

ID	Session 3	Focus: Iris and Fingerprints	
		Title	Authors
153	1	Seg-Edge Bilateral Constraint Network for Iris Segmentation	Junxing Hu (University of Chinese Academy of Sciences; Beijing IrisKing Co., Ltd.); Hui Zhang (Beijing IrisKing Co., Ltd.)*; Lihu Xiao (Beijing IrisKing Co., Ltd.); Jing Liu (Beijing IrisKing Co., Ltd.); Xingguang Li (Beijing IrisKing Co., Ltd.); zhaofeng he (Beijing IrisKing Co., Ltd.); Ling Li (University of Chinese Academy of Sciences)
177	2	Towards Obtaining User Specific Stable Iris Codes Exploiting Low-Rank Tensor Space and Spatial Structure Aware Refinement for Better Iris Recognition	Kiran Raja (NTNU)*; Raghavendra Ramachandra (NTNU, Norway); Christoph Busch (Norwegian University of Science and Technology)
119	3	Iris Recognition with Image Segmentation Employing Retrained Off-the-Shelf Deep Neural Networks	Daniel Kerrigan (University of Notre Dame); Mateusz M Trokielewicz (Warsaw University of Technology)*; Adam Czajka (University of Notre Dame); Kevin Bowyer (University of Notre Dame)
189	4	Deep Contactless Fingerprint Unwarping	Ali Dabouei (West Virginia university)*; Sobhan Soleymani (West Virginia University); Jeremy Dawson (West Virginia University); Nasser Nasrabadi (West Virginia University)
120	5	Cooperative Orientation Generative Adversarial Network for Latent Fingerprint Enhancement	Yuhang Liu (Peking University); Yao Tang (Peking University); Ruilin Li (Peking University); Jufu Feng (Peking University)*

ID	Session 4	Focus: Multi-Modal, Multispectral; Ear and Anti-spoofing	
		Title	Authors
160	1	Audio-Visual Kinship Verification in the Wild	Xiaoting Wu (CMVS, Oulu University)*; Eric Granger (ETS Montreal); Tomi Kinnunen (University of Eastern Finland); Xiaoyi Feng (NPU); Abdenour Hadid (Finland)
140	2	NIR-to-VIS Face Recognition via Embedding Relations and Coordinates of the Pairwise Features	MyeongAh Cho (Yonsei University)*; Tae-young Chung (Yonsei University); Taeoh Kim (Yonsei University); Sangyoun Lee (Yonsei University)
198	3	Generalizing Fingerprint Spoof Detector: Learning a One-Class Classifier	Joshua J Engelsma (Michigan State University)*; Anil Jain (Michigan State University)
63	4	Improving Face Anti-Spoofing by 3D Virtual Synthesis	Jianzhu Guo (NLPR)*; Xiangyu Zhu (Chinese Academy of Science); Jinchuan Xiao (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences); Zhen Lei (NLPR, CASIA, China); Genxun Wan (first research institute of the ministry of public security of PRC); Stan Li (National Lab. of Pattern Recognition, China)
185	5	Iris + Ocular: Generalized Iris Presentation Attack Detection Using Multiple Convolutional Neural Networks	Steven Hoffman (Michigan State University); Renu Sharma (Michigan State University)*; Arun Ross (Michigan State University, USA)

ID	Session 5	Focus: Novel, Mobile and Soft Biometrics	
		Title	Authors
217	1	ScleraSegNet: an Improved U-Net Model with Attention for Accurate Sclera Segmentation	caiyong wang (University of Chinese Academy of Sciences)*; yong he (Hunan University of Technology); Yunfan Liu (Institute of Automation, Chinese Academy of Sciences); zhaofeng he (Beijing IrisKing Co., Ltd.); Ran He (Institute of Automation, Chinese Academy of Sciences); Zhenan Sun (Chinese of Academy of Sciences)
208	2	PRNU-based finger vein sensor identification: On the effect of different sensor croppings	Dominik Söllinger (University of Salzburg); Babak Maser (University of Salzburg); Andreas Uhl (University of Salzburg)*
42	3	Making the most of what you have! Profiling biometric authentication for mobile devices	Sanka Rasnayaka (National University of Singapore)*; Sanjay Saha (Nat); Terence Sim (NUS)
84	4	In Defense of Color Names for Small-Scale Person Re-Identification	Yang Yang (Chinese Academy of Sciences)*; Zhen Lei (NLPR, CASIA, China); Jinqiao Wang (Institute of Automation, Chinese Academy of Sciences); Stan Z. Li (CASIA, China)
92	5	Gender Classification from Iris Texture Images Using a New Set of Binary Statistical Image Features	Juan E Tapia (Universidad Tecnológica de Chile)*; Claudia Arellano (Universidad Tecnológica de Chile)

Day 1 : Poster Presentations

ID	DAY 1	Focus: Face, IRIS and Novel Biometrics		
		Title	Authors	
22	1	Smoothed Attention Network for Single Stage Face Detector	Lei Shi (University of Houston)*; Xiang Xu (University of Houston); Ioannis Kakadiaris (University of Houston)	FACE
37	2	Does Generative Face Completion Help Face Recognition?	Joe Mathai (Information Sciences Institute); Iacopo Masi (University of Southern California)*; Wael Abd-Almageed (Information Sciences Institute)	FACE
55	3	The Harms of Demographic Bias in Deep Face Recognition Research	Raul Vicente Garcia (Fraunhofer IPK)*; Lukasz Wandzik (Fraunhofer IPK)	FACE
82	4	A Simple and Effective Single Stage Face Detector	Lei Shi (University of Houston)*; Xiang Xu (University of Houston); Ioannis Kakadiaris (University of Houston)	FACE
107	5	Deep Learning from 3DLBP Descriptors for Depth Image Based Face Recognition	João B Cardia (Faculdade de Tecnologia do Estado de São Paulo - FATEC)*; Aparecido N Marana (UNESP); Claudio Ferrari (University of Florence); Stefano Berretti (University of Florence, Italy); Alberto Del Bimbo (University of Florence)	FACE
127	6	Video Face Recognition: Component-wise Feature Aggregation Network (C-FAN)	Gong Sixue (Michigan State University)*; Yichun Shi (Michigan State University); Nathan D Kalka (Noblis); Anil Jain (Michigan State University)	FACE
146	7	FaceQnet: Quality Assessment for Face Recognition based on Deep Learning	Javier Hernandez-Ortega (Universidad Autonoma de Madrid)*; JAVIER GALBALLY (EUROPEAN COMMISSION - JOINT RESEARCH CENTER); Julian Fierrez (Universidad Autonoma de Madrid); Rudolf Haraksim (European Commission - Joint Research Center); LAURENT BESLAY (EUROPEAN COMMISSION - JOINT RESEARCH CENTER)	FACE
163	8	Semi-Supervised Low Light Face Enhancement for Mobile Face Unlock	Ha A Le (University of Houston)*; Ioannis Kakadiaris (University of Houston)	FACE
169	9	Attribute-Guided Deep Polarimetric Thermal-to-visible Face Recognition	Seyed mehdi Iranmanesh (West Virginia University)*; Nasser Nasrabadi (West Virginia University)	FACE
173	10	Understanding Confounding Factors in Face Detection and Recognition	Janet Anderson (Noblis)*; Charles Otto (Noblis); Brianna Maze (Noblis); Nathan D Kalka (Noblis); James A Duncan (Noblis)	FACE
199	11	Face Sketch Image Colorization via Supervised GANs	Ramya Y S (IIIT Delhi); Soumyadeep Ghosh (IIIT Delhi); Mayank Vatsa (IIIT-Delhi); Richa Singh (IIIT-Delhi)*	FACE
203	12	End-to-End Protocols and Performance Metrics For Unconstrained Face Recognition	James A Duncan (Noblis)*; Nathan D Kalka (Noblis); Brianna Maze (Noblis); Anil Jain (Michigan State University)	FACE
205	13	Merged Multi-CNN with Parameter Reduction for Face Attribute Estimation	Hiroya Kawai (Tohoku University)*; Koichi Ito (Tohoku University); Takafumi Aoki (Tohoku University)	FACE
80	14	Adversarial Iris Super Resolution	Yanqing Guo (Dalian University of Technology)*; Qianyu Wang (Dalian University of Technology); Huaibo Huang (University of Chinese Academy of Sciences); Xin Zheng (Dalian University of Technology); zhaofeng he (Beijing IrisKing Co., Ltd.)	Iris
113	15	Alignment Free and Distortion Robust Iris Recognition	Min Ren (Center for Research on Intelligent Perception and Computing (CRIPAC), Institute of Automation, Chinese Academy of Sciences (CASIA), University of Chinese Academy of Sciences(UCAS))*; Caiyong Wang (Center for Research on Intelligent Perception and Computing, Institute of Automation, Chinese Academy of Sciences); Yunlong Wang (Center for Research on Intelligent Perception and Computing (CRIPAC) National Laboratory of Pattern Recognition (NLPR) Institute of Automation, Chinese Academy of	Iris

			Sciences (CASIA)); Zhenan Sun (Chinese of Academy of Sciences); Tieniu Tan (NLPR, China)	
131	16	Learning-Free Iris Segmentation Revisited: A First Step Toward Fast Volumetric Operation Over Video Samples	Jeffery D Kinnison (University of Notre Dame)*; Mateusz M Trokielewicz (NASK); Camila Carballo (University of Notre Dame); Adam Czajka (University of Notre Dame); Walter Scheirer (University of Notre Dame)	Iris
179	17	Adversarial Examples to Fool Iris Recognition Systems	Sobhan Soleymani (West Virginia University); Ali Dabouei (West Virginia university); Jeremy Dawson (West Virginia University); Nasser Nasrabadi (West Virginia University)	Iris
129	18	A Feasibility Study on Utilizing Toe Prints for Biometric Verification of Children	David A Yambay (Clarkson University)*; Morgan Johnson (Clarkson University); Keivan Bahmani (Clarkson University); Stephanie Schuckers (Clarkson University)	Novel Biometrics
81	19	A New Approach for EEG-Based Biometric Authentication Using Auditory Stimulation	Sherif N A Seha (University of Toronto, Canada)*; Dimitris Hatzinakos (University of Toronto)	Novel Biometrics
96	20	Permanence of ECG Biometric: Experiments Using Convolutional Neural Networks	Abhishek Ranjan (Nymi Inc)*	Novel Biometrics
99	21	Regressing 3D Face Shapes from Arbitrary Image Sets with Disentanglement in Shape Space	WAN TIAN (Sichuan University)*; Qijun Zhao (Sichuan University)	FACE

Day 2: Poster Presentations

ID	DAY 2	Focus: Fingerprint, Ear, Periocular, Palm Prints, Gait and Gesture, Mobile & Novel Biometrics, Other		
		Title	Authors	
41	1	Gesture-based User Identity Verification as an Open Set Problem for Smartphones	Kálmán Tornai (Peter Pazmany Catholic University)*; Walter Scheirer (University of Notre Dame)	Mobile-based Biometrics
67	2	Mobile Face Recognition Systems: Exploring Presentation Attack Vulnerability and Usability	Heinz Hofbauer (University of Salzburg)*; Luca Debiasi (University of Salzburg); Andreas Uhl (University of Salzburg)	Mobile-based Biometrics
76	3	A novel scheme to address the fusion uncertainty in multi-modal continuous authentication schemes on mobile devices	Max Smith-Creasey (City, University of London)*; Raj Muttukrishnan (city.ac.uk)	Mobile-based Biometrics
85	4	Authenticating Phone Users Using a Gait-Based Histogram Approach on Mobile App Sessions	Tempestt Neal (USF)*; MD Asaduzzaman Noor (University of South Florida); Parush Gera (University of South Florida); Khadija Zanna (University of South Florida); Gurpreet Kaptan (University of South Florida)	Mobile-based Biometrics
87	5	Mobile Biometrics, Replay Attacks, and Behavior Profiling: An Empirical Analysis of Impostor Detection	Tempestt Neal (USF)*; Damon L Woodard ("University of Florida, USA")	Mobile-based Biometrics
102	6	Iris Feature Extraction and Matching Method for Mobile Biometric Applications	Gleb Odinokikh (Samsung R&D Institute Russia)*	Mobile-based Biometrics
192	7	Actions Speak Louder Than (Pass)words: Passive Authentication of Smartphone Users via Deep Temporal Features	Debayan Deb (Michigan State University)*; Arun Ross (Michigan State University, USA); Anil Jain (Michigan State University)	Mobile-based Biometrics
66	8	Fingerprint Quality: Mapping NFIQ1 Classes and NFIQ2 Values	JAVIER GALBALLY (EUROPEAN COMMISSION - JOINT RESEARCH CENTER)*; Elham Tabassi ("NIST, USA"); Rudolf Haraksim (European Commission - Joint Research Center); Pasquale Ferrara (European Commission - Joint Research Center); LAURENT BESLAY (EUROPEAN COMMISSION - JOINT RESEARCH CENTER)	Fingerprints
100	9	Latent Fingerprint Enhancement Based on DenseUNet	Peng Qian (Shanghai Jiao Tong University)*; Manhua Liu (Shanghai Jiao Tong University)	Fingerprints
112	10	Dense Fingerprint Registration via Displacement Regression Network	Zhe Cui (Tsinghua University)*; Jianjiang Feng (Tsinghua University); Jie Zhou (Tsinghua University)	Fingerprints
133	11	Learning Global Fingerprint Features by Training a Fully Convolutional Network with Local Patches	Ruilin Li (Peking University); Dehua Song (Key Laboratory of Machine Perception (Ministry of Education) Department of Machine Intelligence School of Electronics Engineering and Computer Science Peking University, Beijing 100871, P.R.China); Yuhang Liu (Peking University); Jufu Feng (Peking University)*	Fingerprints
114	12	Thermal and Cross-spectral Palm Image Matching in the Visual Domain by Robust Image Transformation	Ewelina Bartuzi (Research and Academic Computer Network)*; Naser Damer (Fraunhofer IGD)	Ear, Periocular, Palm Prints, Gait and Gesture
118	13	Periocular Recognition in the Wild with Orthogonal Combination of Local Binary Coded Pattern in Dual-stream Convolutional Neural Network	Leslie Ching Ow Tiong (KAIST)*; Andrew Beng Jin Teoh (Yonsei University); Yun Li Lee (Sunway University)	Ear, Periocular, Palm Prints, Gait and Gesture
145	14	Gait-Based Age Estimation with Deep Convolutional Neural Network	Shaoxiong Zhang (Beihang University); Yunhong Wang (State Key Laboratory of Virtual Reality Technology and System, Beihang University, Beijing 100191, China); Annan Li (Beijing University of Aeronautics and Astronautics)*	Ear, Periocular, Palm Prints, Gait and Gesture

188	15	OU-ISIR Wearable Sensor-based Gait Challenge: Age and Gender	Trung T Ngo (Osaka University)*; M Ahad (DU); Daigo Muramatsu (Osaka University); Yasushi Makihara ("Osaka University, Japan"); Yasushi Yagi (Osaka University); Sozo Inoue (Kyushu Institute of Technology); Prof. Tahera Hossain Drik ("Respected member, IPC, ICIEV"); Anindya Das Antar (University of Dhaka); Masud Ahmed (University of Dhaka)	Ear, Periocular, Palm Prints, Gait and Gesture
54	16	Gait Recognition from Markerless 3D Motion Capture	James Rainey (Queen's University Belfast)*	Ear, Periocular, Palm Prints, Gait and Gesture
180	17	DeepAttack: Perturbation of Discriminative Fingerprint Image Region Determined by CNN	Steven Fernandes (University of Central Florida)*; Mesut Ozdag (University of Central Florida); Sumit Kumar (University of Central Florida)	Other
220	18	SSBC 2019: Sclera Segmentation Benchmarking Competition	ABHIJIT DAS (Inria)*; Umapada Pal (ISI Kolkata); Michael Blumenstein (University of Technology Sydney)	Other
204	19	Hunt for Fashion via Large Scale Soft Biometrics Analysis	Xiaoyuan Wang (Sichuan University)*; Li Lu (Sichuan University)	Special Session on Large-Scale Soft Biometrics
69	20	On the Extent of Longitudinal Finger Rotation in Publicly Available Finger Vein Data Sets	Bernhard Prommegger (University of Salzburg)*; Christof Kauba (University of Salzburg); Andreas Uhl (University of Salzburg)	Novel Biometrics

Day 3: Poster Presentations

ID	DAY 3	Focus: Anti-spoofing, Multi-Modal and Multi-Spectral Biometrics, Soft Biometrics, Biometric Applications, Template Protection		
		Title	Authors	
60	1	On The Effectiveness of Laser Speckle Contrast Imaging and Deep NeuralNetworks for Detecting Known and Unknown Fingerprint Presentation Attacks	Hengameh Mirzaalian (ISI)*; Mohamed Hussein (USC/ISI); Wael Abd-Almageed (Information Sciences Institute)	Anti-spoofing
91	2	Fingerprint Presentation Attack Detection: Generalization and Efficiency	Tarang Chugh (Michigan State University)*; Anil Jain (Michigan State University)	Anti-spoofing
111	3	Improving Cross-database Face Presentation Attack Detection via Adversarial Domain Adaptation	Guoqing Wang (Institute of Computing Technology, Chinese Academy of Sciences)*; Hu Han (Chinese Academy of Sciences); Shiguang Shan (Chinese Academy of Sciences); Xilin Chen (Institute of Computing Technology, Chinese Academy of Sciences)	Anti-spoofing
116	4	Domain Adaptation in Multi-Channel Autoencoder based Features for Robust Face Anti-Spoofing	Olegs Nikisins (Idiap Research Institute)*; Anjith George (Idiap Research Institute); Sebastien Marcel (Idiap Research Institute)	Anti-spoofing
121	5	Combining Multiple one-class Classifiers for Anomaly based Face Spoofing Attack Detection	Soroush Fatemifar (University of Surrey)*; Muhammad Awais (University of Surrey); Shervin Rahimzadeh Arashloo (Bilkent University); Josef Kittler (University of Surrey, UK)	Anti-spoofing
124	6	Vulnerability assessment and detection of Deepfake videos	Pavel Korsunov (Idiap Research Institute)*; Sébastien Marcel (IDIAP)	Anti-spoofing
158	7	On the Impact of Different Fabrication Materials on Fingerprint Presentation Attack Detection	Lazaro Janier Gonzalez-Soler (Advanced Technologies Application Center)*; Marta Gomez-Barrero (Hochschule Darmstadt); Leonardo Chang (Tecnológico de Monterrey); Airel Perez-Suarez (Advanced Technologies Application Center); Christoph Busch (Hochschule Darmstadt)	Anti-spoofing
162	8	PPG2Live: Using dual PPG for active authentication and liveness detection	Jan E Spooren (imec - DistriNet - KU Leuven)*; Davy Preuveneers (iMinds-DistriNet-KU Leuven); Wouter Joosen (DistriNet - KU Leuven)	Anti-spoofing
166	9	Generalized Presentation Attack Detection: a face anti-spoofing evaluation proposal	Artur Costa-Pazo (Gradiant)*; David Jiménez-Cabello (Gradiant); Esteban Vazquez-Fernandez (Gradiant); Jose Alba-Castro (Vigo University); Roberto Javier Lopez-Sastre (University of Alcala)	Anti-spoofing
194	10	Universal Material Translator: Towards Spoof Fingerprint Generalization	Rohit Gajawada (IIIT Hyderabad)*; Additya Popli (IIIT Hyderabad); Tarang Chugh (Michigan State University); Anoop Namboodiri (IIIT Hyderabad); Anil Jain (Michigan State University)	Anti-spoofing
197	11	Deceiving the Protector: Fooling Face Presentation Attack Detection Algorithms	Akshay Agarwal (IIIT Delhi); Akarsha Sehwal (IIIT Delhi); Mayank Vatsa (IIIT-Delhi); Richa Singh (IIIT-Delhi)*	Anti-spoofing
202	12	Fingerprint Presentation Attack Detection utilizing Time-Series, Color Fingerprint Captures	Richard Plesh (Clarkson University)*	Anti-spoofing
94	13	Cross Spectral Periocular Matching using ResNet Features	Kevin Hernández-Díaz (Halmstad University)*; Fernando Alonso-Fernandez (Halmstad University); Josef Bigun (Halmstad University, Sweden)	Multi-Modal and Multi-Spectral Biometrics
132	14	Hyperspectral Band Selection for Face Recognition Based on a Structurally Sparsified Deep Convolutional Neural Networks	Fariborz Taherkhani (West Virginia University)*; Jeremy Dawson (West Virginia University); Nasser Nasrabadi (West Virginia University)	Multi-Modal and Multi-Spectral Biometrics
136	15	Accurte Personal Recognition using Adaptive Cohort Ranking	Abhinav Anand (IIT Delhi); Amioy Kumar (Accenture, India); Ajay Kumar (The Hong Kong Polytechnic University)*	Multi-Modal and Multi-

				<i>Spectral Biometrics</i>
148	16	Cross-spectrum thermal to visible face recognition based on cascaded image synthesis	Khawla Mallat (EURECOM)*; Naser Damer (Fraunhofer IGD); Fadi Boutros (Fraunhofer IGD); Arjan Kuijper (Fraunhofer Institute for Computer Graphics Research IGD and Mathematical and Applied Visual Computing group, TU Darmstadt); Jean-Luc Dugelay ("Eurecom, France")	<i>Multi-Modal and Multi-Spectral Biometrics</i>
68	17	Suppressing Gender and Age in Face Templates Using Incremental Variable Elimination	Philipp Terhörst (Fraunhofer Institute for Computer Graphics Research IGD)*; Naser Damer (Fraunhofer IGD); Florian Kirchbuchner (Fraunhofer Institute for Computer Graphics Research IGD); Arjan Kuijper (Fraunhofer Institute for Computer Graphics Research IGD and Mathematical and Applied Visual Computing group, TU Darmstadt)	Soft Biometrics
93	18	Polarimetric Thermal to Visible Face Verification via Self-Attention Guided Synthesis	Xing Di (John Hopkins University)*; Benjamin Riggan (US Army Research Laboratory); Shuowen (Sean) Hu (ARL); Nathan Short (Booz Allen Hamilton); Vishal Patel (Johns Hopkins University)	Biometric Applications
74	19	Multi-sample Compression of Finger Vein Images using H.265 Video Coding	Kevin Schörgenhofer (University of Salzburg); Thomas Samy Dafir (University of Salzburg); Andreas Uhl (University of Salzburg)*	Biometric Applications
90	20	A Performance-Optimization Method for Reusable Fuzzy Extractor Based on Block Error Distribution of Iris Trait	Feng Zhu (School of Cyber Security, University of Chinese Academy of Sciences; State Key Laboratory of Information Security, Institute of Information Engineering Chinese Academy of Science); Shen Peisong (State Key Laboratory of Information Security, Institute of Information Engineering Chinese Academy of Science)*; Chen Chi (State Key Laboratory of Information Security, Institute of Information Engineering Chinese Academy of Science)	Template Protection