2018 15th IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS 2018)

Auckland, New Zealand
27 – 30 November 2018
# AVSS 2018 Table of Contents

Simultaneous event localization and recognition for surveillance video........................1
Yikang Li (Arizona State University); Tianshu Yu (Arizona State University); Baoxin Li (Arizona State University)

Optical Flow Dataset and Benchmark for Visual Crowd Analysis.................................7
Gregory Schröder (Technische Universität Berlin); Tobias Senst (TU Berlin); Erik Bochinski (TU Berlin); Thomas Sikora (TU Berlin)

Fast but Not Deep: Efficient Crowd Abnormality Detection with Local Binary Tracklets..........................................................................................................................13
Mahdyar Ravanbakhsh (University of Genova); Hossein Mousavi (Polytechnique Montreal); Moin Nabi (SAP); LUCIO MARCENARO (Università degli Studi di Genoa); Carlo Regazzoni (Università degli Studi di Genoa)

Wardrobe Model for Long Term Re-identification and Appearance Prediction..................19
Kyung Won Lee (SUNY at buffalo); Nishant Sankaran (University at Buffalo); Srirangaraj Setlur (University at Buffalo, SUNY); Nils Napp (University at Buffalo); Venu Govindaraju (University at Buffalo, SUNY)

Combining Local and Global Models for Robust Re-detection..........................................25
Goutam Bhat (Linköping University); Martin Danelljan (Linköping University); Fahad Shahbaz Khan (Linköping University); Michael Felsberg (Linköping University)

Cascade-Dispatched Classifier Ensemble and Regressor for Pedestrian Detection ............31
Remi trichet (INRIA); Francois Bremond (INRIA)

CAMEL Dataset for Visual and Thermal Infrared Multiple Object Detection and Tracking.................................................................................................................................37
Evan T Gebhardt (Georgia Institute of Technology) and Marilyn Wolf (Georgia Institute of Technology)
A Generalized Optimization Framework for Score Aggregation in Person Re-identification Systems
Arko Barman (University of Houston); Shishir Shah (University of Houston)

Fast Simultaneous People Detection and Re-identification in a Single Shot Network
Wiebe Van Ranst (KU Leuven, Belgium); Floris De Smedt (Gent, Belgium); Johnathan Berte (Gent, Belgium); Toon Goedemé (KU Leuven, Belgium)

An Intent-Based Automated Traffic Light for Pedestrians
Christian Ertler (Graz University of Technology); Horst Possegger (Graz University of Technology); Michael Opitz (Graz University of Technology); Horst Bischof (Graz University of Technology)

Efficient Camera Tampering Detection with Automatic Parameter Calibration
Alexey Sidnev (Intel); Marina Barinova (Intel); Sergei Nosov (Intel)

Image fusion and influence function for performance improvement of ATM vandalism action recognition
Jeonseop Yun (Korea University), Junyeop Lee (Korea University), Seongkyu Mun (Korea University), Chul Jin Cho (Korea University), David K. Han (Army Research Lab), Hanseok Ko (Korea University)

Multispectral Matching using Conditional Generative Appearance Modeling
Christoph Bodensteiner (Fraunhofer IOSB); Sebastian W Bullinger (Fraunhofer IOSB); Michael Arens (Fraunhofer IOSB)

Real-Time Vehicle Re-Identification System Using Symmelets and HOMs
Hung Chun Chen (National Taiwan Ocean University, Taiwan); Jun-Wei Hsieh (National Taiwan Ocean University, Taiwan); Shiao-Peng Huang (Chunghwa Telecommunication Laboratories, Taiwan)

GPU-accelerated Height Map Estimation with Local Geometry Priors in Large Scenes
Alireza Rezaei (Paris Sud University); Nicola Pellicanò (Paris Sud University); Emanuel Aldea (University Paris Sud)

Online Multi-Object Tracking with Historical Appearance Matching and Scene Adaptive Detection Filtering.................................................................91

Young-Chul Yoon (Gwangju Institute of Science and Technology); Abhijeet Boragule (Gwangju Institute of Science and Technology); Young-min Song (Gwangju Institute of Science and Technology); Kwangjin Yoon (Gwangju Institute of Science and Technology); Moongu Jeon (Gwangju Institute of Science and Technology)

Scene Adaptation for Semantic Segmentation using Adversarial Learning.................97

Daniele Di Mauro (University of Catania); Antonino Furnari (University of Catania); Giuseppe Patané (Park Smart s.r.l.); Sebastiano Battiato (Università di Catania); Giovanni Maria Farinella (University of Catania)

Edge-Host Partitioning of Deep Neural Networks with Feature Space Encoding for Resource-Constrained Internet-of-Things Platforms.................................................................103

Jong Hwan Ko (Georgia Tech); Taesik Na (Georgia Tech); Mohammad Amir (Georgia Tech); Saibal Mukhopadhyay (Georgia Tech)

WatchNet: Efficient and Sequential Network for People Detection in Video Surveillance Systems........................................................................................................109

Michael Villamizar (Idiap Research Institute); Angel N Martinez Gonzalez (Idiap research institute; EPFL); Olivier Canevet (Idiap Research Institute); Jean-Marc Odobez (IDIAP/EPFL, Switzerland)

Orientation-Aware Regression for Oriented Bounding Box Estimation.........................115

Ryusuke Nosaka (Intelligent Systems Laboratory, SECOM CO., LTD.); Hidenori Ujiie (Intelligent Systems Laboratory, SECOM CO., LTD.); Takaharu Kurokawa (Intelligent Systems Laboratory, SECOM CO., LTD.)

Real-time maritime situation awareness based on deep learning with dynamic anchors.................................................................................................121

Vincent Marié (Aix Marseille Univ, Université de Toulon); Ikhlef Bechar (Aix Marseille Univ, Université de Toulon); Frédéric BOUCHARA (University of Toulon)
Deepfake Video Detection Using Recurrent Neural Networks

David Güera (Purdue University); Edward Delp (Purdue University)

Counting People by Infrared Depth Sensors

Carlos Orrite (University of Zaragoza, Spain); Daniel Vicente (University of Zaragoza, Spain)

Anomaly Detection in Crowds Using Multi Sensory Information

Muhammad Irfan (University of Genova); Laurissa Tokarchuk (Queen Mary University of London, UK); Lucio Marcemaro (Universita degli Studi di Genoa); Carlo Regazzoni (Universita degli Studi di Genoa);

Ontology-based Masking Loss for Improved Generalization in Remote Sensing Semantic Image Retrieval

Arne Schumann (Fraunhofer IOSB); Lars Sommer (Fraunhofer IOSB, Karlsruhe); Max Vogler (Fraunhofer IOSB); Jurgen Beyerer (Fraunhofer IOSB)

Rotation-invariant Binary Representation of Sensor Pattern Noise for Source-Oriented Image and Video Clustering

Xufeng Lin (Charles Sturt University); Chang-Tsun Li (Charles Sturt University)

GPS and IMU Require Visual Odometry for Elevation Accuracy

Dirk Baumbach (DLR); Hongmou Zhang (DLR); Sergey Zuev (DLR); Jürgen Wohlfeil (DLR); Martin Knoche (NIC); Reinhard Klette (Auckland University of Technology)


Oliver Acatay (Fraunhofer IOSB, Karlsruhe); Lars Sommer (Fraunhofer IOSB, Karlsruhe); Arne Schumann (Fraunhofer IOSB); Jurgen Beyerer (Fraunhofer IOSB, Karlsruhe)

A Fast and Accurate Forward Vehicle Start Alarm by Tracking Moving Edges Obtained from Dashboard Camera

Kang Yi (Handong Global University); Kyeong Hoon Jung (Kookmin University)

Use of a Confidence Map Towards Improved Multi-layer Stixel Segmentation
Noor Haitham Saleem (AUT); Reinhard Klette (Auckland University of Technology); Fay Huang (National Ilan University)

Content-Based Multi-Camera Video Alignment using Accelerometer Data......................181

Antonio C. Nazare (Federal University of Minas Gerais); Filipe de O. Costa (Fundação CPqD Centro de Pesquisa e Desenvolvimento em Telecomunicações); William R Schwartz (Federal University of Minas Gerais)

Image-based Sea/Land Map Generation from Radar Data........................................187

Francesc Joan Riera (Aalborg University); Rasmus Engholm (Terma A/S); Lars Jochumsen (Terma A/S); Thomas B. Moeslund (Aalborg University)

Implementation of Modulated Wideband Converter compressed sensing scheme based on COTS lowpass filter with amplitude and phase compensation for spectrum monitoring..................................................................................................................193

Lap Luat Nguyen (Université de Bretagne Occidentale); Anthony Fiche (Université de Bretagne Occidentale); Roland Gautier (Université de Bretagne Occidentale); Charles Canaff (Université de Bretagne Occidentale); Emanuel Radoi (Université de Bretagne Occidentale); Gilles Burel (Université de Bretagne Occidentale)

Neural network control for active cameras using master-slave setup.........................199

Renan Oliveira Reis (Federal University of Minas Gerais); Igor Dias (Federal University of Minas Gerais); William R Schwartz (Federal University of Minas Gerais)

Face Identification for an in-vehicle Surveillance System Using Near Infrared Camera.................................................................205

Minsong Ki (Yonsei University); Bora Cho (Yonsei University); Taejun Jeon (Yonsei University); Yeongwoo Choi (Sookmyung Women’s University); Hyeran Byun (Yonsei University)

A Vision-based Transfer Learning Approach for Recognizing Behavioral Symptoms in People with Dementia......................................................211

Zachary Wharton (Edge Hill University); Erik Thomas (Edge Hill University); Bappaditya Debnath (Edge Hill University); Ardhendu Behera (Edge Hill University)

Unknown Crowd Event Detection from Phase Based Statistics..............................217
Alexia Briassouli (Maastricht University)

Enhancing Visualisation of Anatomical Presentation and Education Using Marker-based Augmented Reality Technology on Web-based Platform..............................................223

I. Wang (Auckland University of Technology); M. Nguyen (AUT); H. Le (Auckland University of Technology); W. Yan (Auckland University of Technology); S. Hooper (Auckland University of Technology)

Scene-based Non-uniformity Correction using Complementary Fixed Pattern Noise Models.................................................................229

Samet Almali (ASELSAN); Omer Faruk Adil (ASELSAN)

Deep-Temporal LSTM for Daily Living Action Recognition.................................................235

Srijan Das (INRIA); Michal Koperski (INRIA); Francois Bremond (Inria Sophia Antipolis); Gianpiiero Francesca (Toyota-Europe)

Residual Transfer Learning for Multiple Object Tracking....................................................241

Juan Diego Gonzales Zuniga (INRIA); Nguyen Thi Lan Anh (INRIA Sophia-Antipolis); Francois Bremond (INRIA Sophia-Antipolis)

Evaluating deep semantic segmentation networks for object detection in maritime surveillance........................................................................247

Tom Cane (University of Reading); James Ferryman (University of Reading)

Pixel Offset Regression (POR) for Single-shot Instance Segmentation................................253

Yuezun Li (SUNY, albany); Xiao Bian (GE Global Research); Ming-Ching Chang (Albany University); Longyin Wen (JD Finance); Siwei Lyu (University at Albany)

A Consensus Framework for Segmenting Video with Dynamic Textures............................259

Lazhar Khelifi (Université de Montreal); Max Mignotte (Université de Montreal)

Contactless Multiple Finger Segments based Identity Verification using Information Fusion from Higher Order Spectral Invariants.........................................................265

Akmal-Jahan MAC (Queensland University of Technology, Australia); Kien Nguyen (Queensland University of Technology); Jasmine Banks (QUT); Vinod Chandran (QUT)
Classifying self-cast shadow regions in aerial camera images………………………………………271

Alexander Gatter (DLR)

Detection of High-Risk Intoxicated Passengers in Video Surveillance…………………………277

Jae-Yeong Lee (Electronics and Telecommunications Research Institute); Sunglok Choi (ETRI); Jaeho Lim (ETRI)

Online Detection of Long-Term Daily Living Activities by Weakly Supervised Recognition of Sub-Activities…………………………………………………………………………………………283

Farhood Negin (INRIA sophia antipolis); Abhishek Goel (INRIA); Gianpiero Francesca (Toyota-Europe)

Deep Residual Learning for Analyzing Customer Satisfaction using Video Surveillance………………………………………………………………………………………………………………………………289

Nehemia Sugianto (Southern Cross University); Dian Tjondronegoro (Southern Cross University); Beau Tydd (Queensland Airports Limited)

Late Fusion of Multiple Convolutional Layers for Pedestrian Detection…………………………295

Ujjwal (INRIA); Aziz Dziri (VEDECOM); Bertrand Leroy (VEDECOM); Francois Bremond (Inria Sophia Antipolis)

Drone Detection Using Convolutional Neural Networks with Acoustic STFT Features………………………………………………………………………………………………………………………………301

Yoojeong Seo (Soongsil University); Beomhui Jang (Soongsil University); Sungbin Im (Soongsil University)

Local Computation with Adaptive Spatial Clustering for Multi-Size Motion Patch Proposals in WAMI………………………………………………………………………………………………………307

Yijun Lin (University of Chinese Academy of Sciences); Yuli Xia (Institute of Software Chinese Academy of Sciences); Fengge Wu (Institute of Software Chinese Academy of Sciences); Junzuo Zhao (Institute of Software Chinese Academy of Sciences)

Adaptive Control of Camera Modality with Deep Neural Network-Based Feedback for Efficient Object Tracking……………………………………………………………………………………………313
Priyabrata Saha (Georgia Institute of Technology); Burhan A Mudassar (Georgia Institute of Technology); Saibal Mukhopadhyay (Georgia Institute of Technology)

Detecting and Counting Sheep with a Convolutional Neural Network…………………………………319

Farah Sarwar (AUT); Anthony Griffin (AUT); Priyadharsini Periasamy (AUT); Kurt Portas (AUT); Jim Law (AUT)

MORA: A Generative Approach to Extract Spatiotemporal Information Applied to Gesture Recognition……………………………………………………………………………………………………325

Igor L Bastos (Universidade Federal de Minas Gerais); Victor Melo (UFMG); Gabriel Gonçalves (Universidade Federal de Minas Gerais); William R Schwartz (Federal University of Minas Gerais)

Adapting MobileNets for mobile based upper body pose estimation…………………………………331

Bappaditya Debnath (Edge Hill University); Mary O’Brien (Edge Hill University); Motonori Yamaguchi (Edge Hill University); Ardhendu Behera (Edge Hill University)

Acoustic Scene Classification Using Joint Time-Frequency Image-Based Feature Representations ………………………………………………………………………………………………………337

Shamsiah Abidin (The University of Western Australia); Roberto Togneri (The University of Western Australia); Ferdous Sohel (Murdoch University)

Latent Body-Pose guided DenseNet for Recognizing Driver’s Fine-grained Secondary Activities……………………………………………………………………………………………………343

Ardhendu Behera (Edge Hill University); Alexander H Keidel (Edge Hill University)

A Blockchain Implementation for the Cataloguing of CCTV Video Evidence…………………349

Michael Kerr (ACIC); Fengling Han (RMIT University); Ron van Schyndel (RMIT University)

Encrypted Domain Skin Tone Detection For Pornographic Image Filtering………………355

Waheeb Yaqub (New York University Abu Dhabi); Manoranjan Mohanty (University of Auckland); Nasir Memon (New York University)

Multimodel Drunk Density Estimation for Safety Assessment……………………………………360
Pratibha Kumari (IIT ROAPR); Mandhatya Singh (IIT ROAPAR); Mukesh Saini (IIT Ropar)

Context is King: Privacy Perceptions of Camera-based Surveillance .......................... 366

Andrew Tzer-Yeu Chen (University of Auckland); Morteza Biglari-Abhari (University of Auckland); Kevin I-Kai Wang (University of Auckland)

Traffic Danger Recognition With Surveillance Cameras Without Training Data ............. 372

Lijun Yu (Peking University); Dawei Zhang (MIX Labs); Xiangqun Chen (Peking University); Alexander Hauptmann (Carnegie Mellon University)

Comparison of Image Classification and Object Detection for Passenger Seat Belt Violation Detection Using NIR & RGB Surveillance Camera Images .............................. 378

Alperen Elihos (Havelsan Inc.); Bensu Alkan (Havelsan Inc.); Burak Balci (Havelsan Inc.); Yusuf Artan (Havelsan Inc.)

A Practical Person Monitoring System for City Security ........................................... 384

Takeharu Eda (NTT); Sanae Muramatsu (NTT); Keita Mikami (NTT); Shi Xu (NTT)

Long Short Working Memory (LSWM) Integration with Polynomial Connectivity for Object Tracking in Wide Area Motion Imagery ................................................. 390

Evan Krieber (University of Dayton); Theus H Aspiras (University of Dayton); Vijayan K Asari (University of Dayton); Yakov Diskin (MZA Asscoaites Corp, USA)

CADP: A Novel Dataset for CCTV Traffic Camera based Accident Analysis .................. 396

Ankit Parag Shah (Carnegie Mellon University); Jean Baptiste Lamare (Carnegie Mellon University); Tuan Nguyen Anh (University of Tokyo); Alexander Hauptmann (Carnegie Mellon University)

Performance Enhancement of YOLOv3 by adding prediction layers with spatial pyramid pooling for vehicle detection ................................................................. 405

Kwang-Ju Kim (ETRI); Pyong-Kun Kim (Electronics and Telecommunications Research Institute); Yunsu Chung (Electronics and Telecommunications Research Institute); Doo-Hyun Choi (Kyungpook National University)

Integrating Multiple Inferences for Vehicle Detection by Focusing on Challenging Test Set 411
Jong Taek Lee (Electronics and Telecommunications Research Institute); Jang-Woon Baek (Electronics and Telecommunications Research Institute); Kiyoun Moon (ETRI); Kil-Taek Lim (Electronics and Telecommunications Research Institute)

Ensemble of Two-Stage Regression Based Detectors for Accurate Vehicle Detection in Traffic Surveillance Data

Lars Sommer (Fraunhofer IOSB, Karlsruhe, Germany); Oliver Acatay (Fraunhofer IOSB, Karlsruhe, Germany); Arne Schumann (Fraunhofer IOSB); Jurgen Beyerer (Karlsruhe Institute of Technology KIT)

Multi-object Tracking Cascade with Multi-Step Data Association and Occlusion Handling

Noor Al-Shakarji (University of Missouri Columbia); Filiz Bunyak (University of Missouri-Columbia); Guna Seetharaman (Naval Research Laboratory); Kannappan Palaniappan (University of Missouri)

Online and Real-Time Tracking with the GM-PHD Filter using Group Management and Relative Motion Analysis

Young-min Song (Gwangju Institute of Science and Technology); Young-Chul Yoon (Gwangju Institute of Science and Technology); Kwangjin Yoon (Gwangju Institute of Science and Technology); Moongu Jeon (Gwangju Institute of Science and Technology)

Extending IOU Based Multi-Object Tracking by Visual Information

Erik Bochinski (TU Berlin); Tobias Senst (TU Berlin); Thomas Sikora (TU Berlin)


Siwei Lyu (University at Albany, State University of New York, USA), Ming-Ching Chang (University at Albany, State University of New York, USA), Dawei Du (University at Albany, State University of New York, USA), Wenbo Li (University at Albany, State University of New York, USA), Yi Wei (University at Albany, State University of New York, USA), Marco Del Caco (National Research Council, Italy), Pierluigi Carcagn (National Research Council, Italy), Arne Schumann (Fraunhofer IOSB, Germany), Bharti Munjal (OSRAM GmbH, Germany), Dinh-Quoc-Trung Dang (Ho Chi Minh University of Science, Vietnam), Doo-Hyun Choi (Kyungpook National University, South Korea), Erik Bochinski (Technische Universitat Berlin, Germany), Fabio Galasso (OSRAM GmbH, Germany), Filiz Bunyak (University of
Missouri Columbia, USA), Guna Seetharaman (U.S Naval Research Laboratory, USA), Jang-Woon Baek (Electronics and Telecommunications Research Institute, South Korea), Jong Taek Lee, Kannappan Palaniappan (University of Missouri Columbia, USA), Kil-Taek Lim (Electronics and Telecommunications Research Institute, South Korea), Kiyyoung Moon (Electronics and Telecommunications Research Institute, South Korea), Kwang-Ju Kim (Electronics and Telecommunications Research Institute, South Korea), Lars Sommer (Karlsruhe Institute of Technology, Germany), Meltem Brandlmairer (OSRAM GmbH, Germany), Min-Sung Kang (DGIST, South Korea), Moong Jeon (Gwangju Institute of Science and Technology, South Korea), Noor M. Al-Shakarji (University of Missouri Columbia, USA), Oliver Acatay (Fraunhofer IOSB, Germany), Pyong-Kun Kim (Electronics and Telecommunications Research Institute, South Korea), Sikandar Amin, Thomas Sikora (Technische Universit at Berlin, Germany), Tien Dinh (Ho Chi Minh University of Science, Vietnam), Tobias Senst (Technische Universitat Berlin, Germany), Vu-Gia-Hy Che (Ho Chi Minh University of Science, Vietnam), Young-Chul Lim (DGIST, South Korea), Young-min Song (Gwangju Institute of Science and Technology, South Korea), and Yun-Su Chung (Electronics and Telecommunications Research Institute, South Korea)

AVSS Challenges 2018 Soft Biometric Retrieval Using Deep Multi-Task Network…………………………………………………………………………………………………447

Gabriel Resende Goncalves (Universidade Federal de Minas Gerais, Belo Horizonte, Brazil); Antonio Carlos Nazare (Universidade Federal de Minas Gerais, Belo Horizonte, Brazil); Matheus Alves Diniz (Universidade Federal de Minas Gerais, Belo Horizonte, Brazil); Luiz Eduardo Coelho Lima (Universidade Federal de Minas Gerais, Belo Horizonte, Brazil); William Robson Schwartz (Universidade Federal de Minas Gerais, Belo Horizonte, Brazil)

Feature Selection for Subject Ranking using Soft Biometric Queries…………………………453

Emil Barbuta Cipcigan (University of Southampton); Mark S.Nixon (University of Southampton)

Transfer Learning Based Approach for Semantic Person Retrieval………………………….459

Takuya Yaguchi (So-net Media Networks Corp., Tokyo, Japan); Mark S. Nixon (University of Southampton, Southampton, United Kingdom)

Attribute-based Person Retrieval and Search in Video Sequences……………………………465
Arne Schumann (Fraunhofer IOSB, Germany); Andreas Specker (Karlsruhe Institute of Technology, Germany); Jurgen Beyerer (Karlsruhe Institute of Technology, Germany)

Person Retrieval in Surveillance Video using Height, Color and Gender..............................471

Hiren Galiyawala (Ahmedabad University, India), Kenil Shah (L. D. College of Engineering, India), Vandit Gajjar (Ahmedabad University, India), Mehul S. Raval (Ahmedabad University, India)


Michael Halstead (Queensland University of Technology, Australia); Simon Denman (Queensland University of Technology, Australia), Clinton Fookes (Queensland University of Technology, Australia) YingLi Tian (City College of New York, US) Mark S. Nixon (University of Southampton, UK)

Detection of Fairy Circles in UAV Images Using Deep Learning........................................483

Yuhong Zhu (AUT, New Zealand); Zahra Moayed (AUT, New Zealand); Barbara Bollard-Breen (AUT, New Zealand); Ashray Doshi (AUT, New Zealand); Jean Baptiste Ramond (University of Pretoria, South Africa); Reinhard Klette (AUT, New Zealand)

Computer vision based pose detection of agricultural implements without a priori knowledge of their geometry and visual appearance..........................................................489

Michael Erz (Robert Bosch GmbH, Germany)

Analysis of Motion Patterns for Pain Estimation of Horses..................................................495

Ralf Reulke (Humboldt-Universitat zu Berlin, Germany), Dominik Rueß (Humboldt-Universitat zu Berlin, Germany), Niklas Deckers (Humboldt-Universitat zu Berlin, Germany), Dirk Barnewitz (Tierarztliche Klinik der fzmb GmbH, Germany), Anne Wieckert (Tierarztliche Klinik fur Pferde, Germany), Kathrin Kienapfel (Ruhr-Universitat Bochum, Germany)

UNICITY: A depth maps database for people detection in security airlocks.........................501

Joel Dumouliny (HumanTech Institute, HES-SO Fribourg, Switzerland), Olivier Canevetz (Idiap Research Institute, Switzerland), Michael Villamizarz (Idiap Research Institute, Switzerland), Hugo Nunes (Fastcom Technology SA, Lausanne, Switzerland), Omar Abou Khaledy (HumanTech Institute, HES-SO Fribourg, Switzerland), Elena Mugelliniy
Hierarchical spatial object detection for ATM vandalism surveillance

Jun-Yeop Lee (Korea University, Seoul, Korea); Chul-Jin Cho (Korea University, Seoul, Korea); David K. Han (Army Research Lab, Adelphi, MD USA); Hanseok Ko (Korea University, Seoul, Korea)

Improving Real-Time Pedestrian Detectors with RGB+Depth Fusion

Tanguy Ophoff (KU Leuven, Sint-Katelijne-Waver, Belgium), Kristof Van Beeck (KU Leuven, Sint-Katelijne-Waver, Belgium), Toon Goedem (KU Leuven, Sint-Katelijne-Waver, Belgium)

Deep Hybrid Network for Automatic Quantitative Analysis of Facial Paralysis

Gee-Sern Jison Hsu (National Taiwan University of Science and Technology, Taiwan); Min-Hsiang Chang (National Taiwan University of Science and Technology, Taiwan)

Fourier-Mellin Transform and Fractal Coding for Secure and Robust Fingerprint Image Hashing

Sani M. Abdullahi (Southwest Jiaotong University, China); Hongxia Wang (Sichuan University, China)

Research on Image Recognition Method Based on Deep Learning Algorithm

Yasen Aizezi (Xinjiang Police College, China); Anniwaer Jiamali (Xinjiang Police College, China); Ruxianguli Abudurexiti (Xinjiang Police College, China); Xuehua Liu (Chinese Academy of Sciences, Beijing, China); Jin Du (YunNan Police College, Kunming, China); Liping Ding (Chinese Academy of Sciences, Beijing, China)

Human Behaviour Recognition Using Deep Learning

Jia Lu (Auckland University of Technology, New Zealand), Wei Qi Yan (Auckland University of Technology, New Zealand) and Minh Nguyen (Auckland University of Technology, New Zealand)

Currency Detection and Recognition Based on Deep Learning
Qian Zhang (Auckland University of Technology, New Zealand), Wei Qi Yan (Auckland University of Technology, New Zealand)

Web attack forensics based on network traffic behaviour characteristics and URLs………550

Guozi SUN (Nanjing University of Posts and Telecommunications, China), Lei ZHU (Nanjing University of Posts and Telecommunications, China), Huakang LI (Nanjing University of Posts and Telecommunications, China); Wenjun LI (Beijing Municipal Public Security Bureau, Beijing, China)

DDoS Attacks and Flash Event Detection Based on Flow Characteristics in SDN…………556

Guozi SUN (Nanjing University of Posts and Telecommunications, Nanjing, China), Wenti JIANG (Nanjing University of Posts and Telecommunications, Nanjing, China), Yu GU (Nanjing University of Posts and Telecommunications, Nanjing, China), Danni REN (Nanjing University of Posts and Telecommunications, Nanjing, China), Huakang LI (Nanjing University of Posts and Telecommunications, Nanjing, China)

Botnet homology method based on symbolic approximation algorithm of communication characteristic curve……………………………………………………………………………562

Zhihon Nan (Shanxi University of Finance and Economics); Lichao Zhai (Shanxi University of Finance and Economics); Lidong Zhai (Chinese Academy of Sciences); Huiming Liu (Tencent Security Xuanwu Lab Beijing China)

The Dynamic Data Integrity Verification and Recovery Scheme based on MHT…………568

Yasen AIZEZI (Xinjiang Police College, Urumqi, China); Yuhua FENG (Xinjiang Police College, Urumqi, China); Li YU (Xinjiang Police College, Urumqi, China); Guozi SUN (Nanjing University of Posts and Telecommunications, China)

Comparative Evaluations of Privacy on Digital Images……………………………………574

Xue Zhang (AUT, New Zealand); Wei Qi Yan (AUT, New Zealand)

Index……………………………………………………………………………………580