

# Contents

## Computer Graphics, Perception and Image Quality

Generation of Complex Underground Systems for Application in Computer Games with Schematic Maps and L-Systems . . . . .	3
<i>Izabella Antoniuk and Przemyslaw Rokita</i>	
Texture Based Quality Assessment of 3D Prints for Different Lighting Conditions. . . . .	17
<i>Jarosław Fastowicz and Krzysztof Okarma</i>	
Pseudoinversion Fractals . . . . .	29
<i>Krzysztof Gdawiec</i>	
Easing Functions in the New Form Based on Bézier Curves. . . . .	37
<i>Łukasz Izdebski and Dariusz Sawicki</i>	
Perceptual Experiments Optimisation by Initial Database Reduction. . . . .	49
<i>Anna Lewandowska (Tomaszewska)</i>	
Decoupling Rendering and Display Using Fast Depth Image Based Rendering on the GPU . . . . .	61
<i>Julian Meder and Beat Brüderlin</i>	
Physically Based Area Lighting Model for Real-Time Animation . . . . .	73
<i>Michał Olejnik, Dominik Szajerman, and Piotr Napieralski</i>	
Calibration of Structural Similarity Index Metric to Detect Artefacts in Game Engines . . . . .	86
<i>Rafał Piórkowski and Radosław Mantiuk</i>	
Generalized Depth-of-Field Light-Field Rendering. . . . .	95
<i>David C. Schedl, Clemens Birklbauer, Johann Gschnaller, and Oliver Bimber</i>	

## Low-Level and Middle-Level Image Processing

Anisotropic Diffusion for Smoothing: A Comparative Study. . . . .	109
<i>César Bustacara, Miller Gómez-Mora, and Leonardo Flórez-Valencia</i>	
Comparison and Evaluation of First Derivatives Estimation . . . . .	121
<i>César Bustacara-Medina and Leonardo Flórez-Valencia</i>	

Linear Spectral Mixture Analysis of Hyperspectral Images with Atmospheric Distortions. . . . .	134
<i>Anna Denisova, Yuliya Juravel, and Vladislav Myasnikov</i>	
Simple and Efficient Method of Low-Contrast Grayscale Image Binarization . . . . .	142
<i>Kamil Ekštejn</i>	
Single Image Haze Removal Using Single Pixel Approach Based on Dark Channel Prior with Fast Filtering . . . . .	151
<i>Sung Yong Jo, Jeongmok Ha, and Hong Jeong</i>	
Deep Neural Image Denoising . . . . .	163
<i>Michał Koziarski and Bogusław Cyganek</i>	
Multi-layer Lacunarity for Texture Recognition . . . . .	174
<i>Przemysław Mazurek and Dorota Oszutowska-Mazurek</i>	
Saliency Enhanced Decolorization. . . . .	184
<i>Michał Zemko and Elena Sikudova</i>	
<b>3D and Stereo Image Processing</b>	
Depth Guided Detection of Salient Objects. . . . .	197
<i>Łukasz Dąbala and Przemysław Rokita</i>	
Fast Extraction of 3D Fourier Moments via Multiple Integral Images: An Application to Antitank Mine Detection in GPR C-Scans . . . . .	206
<i>Przemysław Kłesk, Mariusz Kapruziak, and Bogdan Olech</i>	
Achieving Flexible 3D Reconstruction Volumes for RGB-D and RGB Camera Based Approaches. . . . .	221
<i>Sebastian Mock, Philipp Lensing, and Wolfgang Broll</i>	
Minimal Interaction Touchless Text Input with Head Movements and Stereo Vision . . . . .	233
<i>Adam Nowosielski</i>	
Application of Structural Similarity Based Metrics for Quality Assessment of 3D Prints . . . . .	244
<i>Krzysztof Okarma, Jarosław Fastowicz, and Mateusz Teclaw</i>	
Depth Estimation Based on Maximization of a Posteriori Probability. . . . .	253
<i>Olgierd Stankiewicz, Krzysztof Wegner, and Marek Domanski</i>	
3D Reconstruction of Ultrasonic B-Scans for Nondestructive Testing of Composites . . . . .	266
<i>Angelika Wronkiewicz, Krzysztof Dragan, Michał Dziendzikowski, Marek Chalimoniuk, and Claudio Sbarufatti</i>	

## Human Face and Silhouette Recognition and Analysis

Automatically Analyzing Interpersonal Closeness in Photo Albums . . . . .	281
<i>Gaocheng Bai, Jiansheng Chen, Bo Huang, and Zhengqin Li</i>	
Component-Based Ethnicity Identification from Facial Images . . . . .	293
<i>A. Boyseens and S. Viriri</i>	
Human Detection in Low Resolution Thermal Images Based on Combined HOG Classifier . . . . .	304
<i>Sebastian Budzan</i>	
Kinect and IMU Sensors Imprecisions Compensation Method for Human Limbs Tracking . . . . .	316
<i>Grzegorz Glonek and Adam Wojciechowski</i>	
Face Photo-Sketch Transformation and Population Generation . . . . .	329
<i>Georgy Kukharev and Andrei Oleinik</i>	
Similarity Measures for Face Images: An Experimental Study . . . . .	341
<i>Maciej Smiatacz</i>	
Log-Gabor Transforms and Score Fusion to Overcome Variations in Appearance for Face Recognition . . . . .	353
<i>Mithat Çağrı Yildiz, Omid Sharifi, and Maryam Eskandari</i>	

## Medical Image Analysis

Optimization of Numerical Calculations of Geometric Features of a Curve Describing Preprocessed X-Ray Images of Bones as a Starting Point for Syntactic Analysis of Finger Bone Contours . . . . .	365
<i>Marzena Bielecka and Adam Piórkowski</i>	
Construction of a 3D Geometric Model of a Presynaptic Bouton for Use in Modeling of Neurotransmitter Flow . . . . .	377
<i>Andrzej Bielecki, Maciej Gierdziewicz, Piotr Kalita, and Kamil Szostek</i>	
Application of the Point Distance Histogram to the Automatic Identification of People by Means of Digital Dental Radiographic Images . . . . .	387
<i>Dariusz Frejlichowski</i>	
Airway Segmentation, Skeletonization, and Tree Matching to Improve Registration of 3D CT Images with Large Opacities in the Lungs . . . . .	395
<i>Duván Alberto Gómez Betancur, Anna Fabijańska, Leonardo Flórez-Valencia, Alfredo Morales Pinzón, Eduardo Enrique Dávila Serrano, Jean-Christophe Richard, Maciej Orkisz, and Marcela Hernández Hoyos</i>	

Regions of Interest in a Fundus Image Selection Technique Using the Discriminative Analysis Methods . . . . .	408
<i>Nataly Ilyasova, Rustam Paringer, and Alexander Kupriyanov</i>	
Blue Whitish Veil, Atypical Vascular Pattern and Regression Structures Detection in Skin Lesions Images . . . . .	418
<i>Karol Kropidłowski, Marcin Kociolek, Michał Strzelecki, and Dariusz Czubinski</i>	
Applying Artificial Neural Network for the Classification of Breast Cancer Using Infrared Thermographic Images . . . . .	429
<i>Vanessa Lessa and Mauricio Marengoni</i>	
Fully-Automatic Method for Assessment of Flow-Mediated Dilation . . . . .	439
<i>Bartosz Zieliński, Agata Drózdź, and Marzena Frołow</i>	
<b>Motion Analysis, Tracking and Surveillance</b>	
Orthogonal Gradient-Based Binary Image Representation for Vehicle Detection. . . . .	453
<i>Zbigniew Czapla</i>	
Multi-view Data Aggregation for Behaviour Analysis in Video Surveillance Systems . . . . .	462
<i>Paweł Forczmański and Adam Nowosielski</i>	
Moving Object Detection Using SIFT Matching on Three Frames for Advanced Driver Assistance Systems . . . . .	474
<i>Jeongmok Ha, WooYeol Jun, and Hong Jeong</i>	
FPGA Implementation of the Flux Tensor Moving Object Detection Method . . . . .	486
<i>Piotr Janus, Kamil Piszczek, and Tomasz Kryjak</i>	
Visual Target Tracking Using a Low-Cost Methodology Based on Visual Words. . . . .	498
<i>Andrzej Śluzek, Aamna Alali, Aamna Alzaabi, and Alia Aljasmī</i>	
Reference Data Set for Accuracy Evaluation of Orientation Estimation Algorithms for Inertial Motion Capture Systems . . . . .	509
<i>Agnieszka Szczesna, Przemysław Skurowski, Przemysław Prusowski, Damian Pęszor, Marcin Paszkuta, and Konrad Wojciechowski</i>	
<b>Security and Protection</b>	
Selection of Relevant Filter Responses for Extraction of Latent Images from Protected Documents . . . . .	523
<i>Victor Fedoseev and Elena Mishkina</i>	

Comparing Images for Document Plagiarism Detection . . . . .	532
<i>Marcin Iwanowski, Arkadiusz Cacko, and Grzegorz Sarwas</i>	
Remote Sensing Data Copy-Move Forgery Protection Algorithm . . . . .	544
<i>Andrey Kuznetsov</i>	

## Applications

Time Series Prediction for Electric Power Industry with the Help of Syntactic Pattern Recognition . . . . .	555
<i>Mariusz Flasiński, Janusz Jurek, and Tomasz Peszek</i>	
Simultaneous Mixed Vertical and Horizontal Handwritten Japanese Character Line Detection . . . . .	564
<i>Tomotaka Kimura, Chinthaka Premachandra, and Hiroharu Kawanaka</i>	
Determination of Road Traffic Flow Based on 3D Daubechies Wavelet Transform of an Image Sequence . . . . .	573
<i>Marcin Jacek Kłos</i>	
Robust Knot Segmentation by Knot Pith Tracking in 3D Tangential Images . . .	581
<i>Adrien Krähenbühl, Jean-Romain Roussel, Bertrand Kerautret, Isabelle Debled-Rennesson, Frédéric Mothe, and Fleur Longuetaud</i>	
Artificial Neural Network Based Sinhala Character Recognition . . . . .	594
<i>H. Waruna H. Premachandra, Chinthaka Premachandra, Tomotaka Kimura, and Hiroharu Kawanaka</i>	
Evolving Node Transfer Functions in Artificial Neural Networks for Handwritten Digits Recognition . . . . .	604
<i>Dmytro Vodianyuk and Przemysław Rokita</i>	

## Mathematical Analysis, Estimation and Approximation

Finding Line Segments in the Ulam Square with the Hough Transform . . . .	617
<i>Leszek J. Chmielewski and Arkadiusz Orłowski</i>	
Analysis of 4D Hypercomplex Generalizations of Julia Sets . . . . .	627
<i>Andrzej Katunin</i>	
2D-Leap-Frog and Removal of Outliers in Noisy Photometric Stereo with Non-distant Illuminations . . . . .	636
<i>Ryszard Kozera, Felicja Okulicka-Dłużewska, and Lyle Noakes</i>	
The Use of Interpolation Methods for Nonlinear Mapping . . . . .	649
<i>Evgeny Myasnikov</i>	

<b>Author Index</b> . . . . .	657
-------------------------------	-----

Computer Vision and Graphics

International Conference, ICCVG 2016, Warsaw, Poland,

September 19-21, 2016, Proceedings

Chmielewski, L.J.; Datta, A.; Kozera, R.; Wojciechowski, K.  
(Eds.)

2016, XIII, 658 p. 330 illus., Softcover

ISBN: 978-3-319-46417-6