Table of Contents

Igor P. Gurov

Organizer and Cooperation Societies
Honorary Chairs and Committee

INVITED PLENARY LECTURES

Speckle: Friend or foe?
Joseph W. Goodman

New representations for multidimensional functions based on Kolmogorov superposition theorem.
Applications on image processing
F. Truchetet, P. E. Léni, and Y. Fougerolle

OPTICAL IMAGE FORMATION AND ANALYSIS

Flying triangulation - A motion-robust optical 3D sensor for the real-time shape acquisition of complex objects
Florian Willomitzer, Svenja Ettl, Oliver Arold, and Gerd Häusler

Application of structural methods for stereo depth map improvement
Roman Malashin, Maxim Peterson, and Vadim Lutsiv

Non-conventional imaging systems for 3D digitization of transparent objects: Shape from polarization in the IR and shape from visible fluorescence induced UV
F. Meriaudeau, R. Rantoson, K. M. Adal, D. Fofi, and C. Stolz

Optical sensors and algorithms for life-sign detection in USaR-operations
A. Mäyrä, K. Känsälä, K. Ojala, P. Aitta, T. Hietavalkama, F. Fernandez, L. Hildebrand, and J. Bussion
EM information leakage from display unit and visual inspection for its leakage source
   Takashi Watanabe and Hiroshi Sako

Cognitive robotic system for learning of complex visual stimuli
   A. S. Potapov and A. S. Rozhkov

Optimized data processing for an optical 3D sensor based on flying triangulation
   Svenja Ettl, Oliver Arold, Gerd Häusler, Igor Gurov, and Mikhail Volkov

Mid-infrared reflectography for the analysis of pictorial surface layers in artworks
   Claudia Daffara, Dario Ambrosini, Luca Pezzati, and Paola Ilaria Mariotti

Learning representative features for facial images based on a modified principal component analysis
   Anton Averkin and Alexey Potapov

GPU architecture usage for efficient image scaling
   P. Skakov

OPTICAL SENSING BY COHERENT LIGHT

Fast mapping of surface defects by using dynamic speckles
   I. S. Sidorov, E. Nippolainen, and A. A. Kamshilin

Optical testing by absolute length measurement with wavelength tuning interferometer
   Kenichi Hibino, Yangjin Kim, and Makoto Ito

Digital off-axis holography: Reconstruction from undersampled pattern
   Konstantin Grebenyuk, Anton Grebenyuk, and Vladimir Ryabukho

Novel fiber-optic sensor of high electrical alternating currents
   Mertsi Haapalainen, Salvatore Di Girolamo, Antonio S. B. Sombra, and Alexei A. Kamshilin

Analysis of interferometer with adaptive reference wave
   Jiri Novak, Pavel Novak, and Antonin Miks

Extended full-field optical coherence microscopy
   Arnaud Dubois

Longitudinal spatial coherence of the optical field and its effects in the interference microscopy
   Dmitry Lyakin, Vladislav Lychagov, Ilya Smirnov, Sergey Klykov, Anton Sdobnov, and Vladimir Ryabukho

iv
Numerical reconstruction of volumetric image in swept-source interference microscopy
Anton A. Grebenyuk and Vladimir P. Ryabukho 147

The study of documentary photographs of the early 20th century by the optical coherence microscopy method
Ekaterina Ryseva and Ekaterina Zhukova 155

Investigation of Khokhola painting by the optical coherence tomography method
Anna Levshina, Ekaterina Zhukova, and Nikita Margaryants 160

Refractive index sensing in aqueous environment using three different polymeric waveguide interferometers
Meng Wang, Jussi Hiltunen, and Risto Myllylä 166

Investigation of noise-immunity of the method of extending the unambiguous range in two-wavelength interferometric systems
M. Volkov and T. Vorontsova 172

OPTICAL SENSING APPLICATIONS

Optical anisotropic reflectance from W720 LIPSS surface
Martti Silvennoinen, Niko Penttinen, Stanislav Hasoň, and Raimo Silvennoinen 178

Model–based non–destructive investigation methods in semiconductor industry
B. Bilski, V. Ferreras Paz, K. Frenner, and W. Osten 185

Adapting optical technologies for low pressure measurements in the marine industry (1-10 bar)
D. Rodriguez Sanmartín, A. Lawal, G. Awcock, S. Busbridge, P. Cooper, and J. Spenceley 192

Analysis of design parameters and imaging properties of membrane fluidic lenses
Jiri Novak, Pavel Novak, and Antonin Miks 197

Study of ink optical properties by ATR spectroscopy
D. Fatkhullina and E. Zhukova 205

Direct, trans-irradiation and multispectral infrared imaging of a Titian canvas
Claudia Daffara, Francesca Monti, Raffaella Fontana, Paola Artoni, and Ornella Salvadori 212

Optical system for monitoring dynamics of blood perfusion
Victor Teplov, Ervin Nippolainen, and Alexei A. Kamshilin 218

Tumor cell differentiation by label-free microscopy
Herbert Schneckenburger, Petra Weber, and Michael Wagner 226
Development of tunable Fabry-Perot spectral camera and light source for medical applications
M. Kaarre, S. Kivi, P. E. Panouillot, H. Saari, J. Mäkynen, I. Sorri, and M. Juuti

Representation quality analysis on example of compression of 3D biomedical images
A. Potapov and N. Kapliev

Author Index