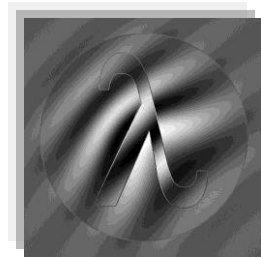




I International Scientific School “Methods of Digital Image Processing in Optics and Photonics” 8–11 April 2014



The first international scientific school “Methods of Digital Image Processing in Optics and Photonics” was held with a view to develop cooperation between world-class experts, young scientists, students and post-graduate students, and to exchange information on the current status and directions of research in the field of digital image processing in optics and photonics.

The International Scientific School was managed by:

- Saint Petersburg National Research University of Information Technologies, Mechanics and Optics (ITMO University) – Saint Petersburg (Russia);
- Chernyshevsky Saratov State University – Saratov (Russia);
- National research nuclear University “MEPHI” (NRNU MEPhI) – Moscow (Russia)

The school was held with the participation of the local chapters of Optical Society of America (OSA), the Society of Photo-Optical Instrumentation Engineers (SPIE) and IEEE Photonics Society:



Topics:

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| <ul style="list-style-type: none"> • Diffraction imaging • Interferometry and digital holography • OCT and 3D vision • Imaging in scattering and inhomogeneous media • Hyperspectral imaging | <ul style="list-style-type: none"> • Super-resolution and sub-diffraction limit imaging • Optical correlators and pattern recognition • Optical image and signal processing • Biomedical imaging |
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School program:

- Invited lectures from leading Russian and international specialists in the field of methods of digital image processing.
- Reports from young scientists, students and post-graduate students
- Topical seminars and workshop sessions



Invited lectures

M E Gusev, Advantages and new opportunities of digital holographic interferometry, Immanuel Kant Baltic Federal University – Kaliningrad (Russia)

A Kamshilin, Blood pulsation imaging as a tool for studying the cardiovascular system, University of Eastern Finland (Finland)

V Katkovnik, Phase imaging from noisy interferometric observations via sparse coding of phase and magnitude, Tampere University of Technology – Tampere (Finland)

V V Petrov, Construction of the high-resolution acoustic tomography, National Research University of Saratov – Saratov (Russia)

V G Volostnikov, Spiral light beams: properties and applications, Samara Branch of the P.N. Lebedev Physical Institute of the Russian Academy of Sciences – Samara (Russia)

Chairs

Professor I P Gurov (ITMO University)

Professor S A Kozlov (ITMO University)

Scientific committee

O V Andreeva (ITMO University)

V G Bespalov (ITMO University)

P A Cheremkhin (NRNU MEPhI)

K A Grebenyuk (Saratov State University)

I P Gurov (ITMO University)

S A Kozlov (ITMO University)

V V Krasnov (NRNU MEPhI)

N V Petrov (ITMO University)

A S Potapov (Vavilov State Optical Institute)

M A Volynsky (ITMO University)

Scientific Secretary

N V Petrov (ITMO University)

Chairman of the Organizing Committee

M K Khodzitsky (ITMO University)

Organizing Committee

T Yu Nikolaeva, M O Osipova, V A Semenova

Session Chairs

Interferometry and digital holography

N V Petrov, ITMO University – Saint Petersburg (Russia)

K A Grebenyuk, Saratov State University – Saratov (Russia)

Broadband, low-coherence methods of image formation and analysis

P A Cheremkhin, NRNU MEPhI – Moscow (Russia)

Khodzitsky M K, ITMO University – Saint Petersburg (Russia)

Representation, encoding, and recognition of images

Krasnov V V, NRNU MEPhI – Moscow (Russia)

Cheremkhin P A, NRNU MEPhI – Moscow (Russia)

Image and optical fields processing algorithms

Volynsky M A, ITMO University – Saint Petersburg (Russia)

The I International Scientific School “Methods of Digital Image Processing in Optics and Photonics” took place at the Department of Photonics and Optical Information Technology of ITMO University, Saint Petersburg, Russia. All sessions were held in the building where Yuri Nikolaevich Denisyuk, the founder of volume holography, worked and conducted research for a long time.



Department of Photonics and Optical Information Technology, ITMO University,
Saint Petersburg, Russia



Invited lecture “*Phase imaging from noisy interferometric observations via sparse coding of phase and magnitude*” **V Katkovnik**, Department of Signal Processing, Technology University of Tampere, Finland



Invited lecture “*Benefits and opportunities of digital holographic interferometry*” **Gusev M E**, Immanuel Kant Baltic Federal University, Kaliningrad, Russia

All papers published in this volume of Journal of Physics: Conference Series have been peer reviewed. Reviews were conducted by experts to the professional and scientific standards expected of a proceedings journal published by IOP Publishing. This Proceedings Volume contains 2 invited lectures and 26 reviewed papers, organized by topics and in alphabetical order.