



Call for Papers

2013 International Symposium on Optomechatronic Technologies

October 28 - 30, 2013 in Jeju Island, Korea

www.isot2013.org

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Invitation to ISOT2013

The organizers are pleased to invite you to the 2013 International Symposium on Optomechatronic Technologies (ISOT2013) in Jeju Island, Korea. The ISOT 2013 will provide researchers and engineers with a great opportunity to present and discuss the latest research results, accomplishments, developments, and future directions in the integrated fields of optics and mechatronics technologies. As its isolated location and romantic tropical image, Jeju Island has become a favorite retreat with honeymooners and tourists. Blessed with spectacular nature created by volcanic activities, Jeju volcanic island and lava tubes were designated as World Natural Heritages by UNESCO.

Topics of Interest

The symposium scopes include, but are not limited to;

- Adaptive/Controllable optics
- Optomechatronics for microscopes
- Laser/Fiber optics
- Optofluidics
- Micro optoelectro mechanical systems (MOEMS)
- Bio-medical imaging
- Visual motion tracking and control
- Machine vision/Optical imaging
- Optical and vision-based monitoring/control
- Optical-based sensors and actuators
- Optical metrology
- Vision-based micro/nano manipulation
- Optomechatronics for astronomy/space applications
- Optomechatronics for robotic applications
- Optomechatronics for bio-medical applications
- Optomechatronics for manufacturing applications

Important Dates

- Paper submission: July 20, 2013
- Acceptance notification: August 25, 2013
- Final paper submission: September 22, 2013



Paper Submission

Prospective authors are invited to submit through the symposium website. The contributed papers are subject to a peer review for scope suitability, impact effect, theoretical and practical contributions. All of accepted and presented papers will be published in the symposium proceedings.

A limited number of excellent papers will be published in the special issue of International Journal of Optomechatronics (IJO) of Taylor & Francis indexed by SCIE. The paper length is 3 to 6 pages in IEEE styled two columns. Authors can choose one of the two presentation ways; oral or poster. At least 6 page papers will be considered for oral presentation and possible inclusion of the IJO.



Call for Special Session

Prospective authors are encouraged to organize sessions relating to the above topic of interest. The special sessions provide a forum for focused discussions on new and innovative topics. Typically, each special session consists of 5 papers. The special papers will undergo the same review process as regular papers. For more information, visit the website, www.isot2013.org.

Industrial Exhibition

ISOT2013 offers an opportunity to meet and network with professionals both from academia and from industry in an atmosphere of free yet serious technical discussions. The breadth of research topics combined with the depth of invited and contributed technical presentations makes this symposium popular among professionals in industry. Exhibitors will display their products and services relating to optomechatronic technologies.

Explore Jeju Island



Build the Optomechatronic World in Jeju Island! Mark the dates on your calendar.

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Plenary Speakers

• **Prof. Joel Kubby, University of California, Santa Cruz, USA**



“Adaptive Optical Microscopy using Direct Wavefront Sensing”

This talk will review the development of wide-field and confocal microscopes with direct wavefront sensing and adaptive optics for correcting aberrations when imaging through thick tissues (*Drosophila* embryos and mouse brain tissue). In order to make direct wavefront measurements in biological specimens, we have modified the laser guide-star

techniques used in astronomy for measuring wavefront aberrations that occur as star light passes through Earth's turbulent atmosphere. Here sodium atoms in Earth's mesosphere, at an altitude of 95 km, are excited to fluoresce at resonance by a high-power sodium laser. The fluorescent light creates a guide-star reference beacon at the top of the atmosphere that can be used for measuring wavefront aberrations that occur as star light passes through the atmosphere.

• **Dr. Gunther Notni, Fraunhofer Institute for Applied Optics and Precision Engineering, Germany**



“High-resolution dynamic 3-D-shape measurement”

Three-dimensional (3-D) measurement of object topographies has become an important challenge, e.g. in industrial quality control, rapid prototyping and medicine. Optical techniques are a well-established method for performing these measurements, as they provide benefits like operating contactless or offering the possibility of full-field measurements.

Meanwhile, often not only high accuracy and precision are demanded, but also high speed giving the possibility to measure dynamic objects or processes. For this active 3-D shape measurement techniques are a possible solution. This contribution gives an overview over active 3-D shape measurement techniques, highlights new methods for high-speed pattern projection techniques and shows several applications, f.e. in in-line quality control and human-face animation, obtained with the developed setups. In widely-used active 3-D shape measurement arrangements, 3-D data is obtained by identifying corresponding points in both images which are used to perform triangulation. The correspondence search is simplified and the computational speed increased by projecting a sequence of patterns onto the object surface.

• **Prof. Seung-Woo Kim, Korea Advanced Institute of Science and Technology, Korea**



“New Possibilities of Femtosecond Lasers for Advanced Metrology in Space Missions”

The laser was first used in the space mission of lunar laser ranging in Apollo 15. Since then, various cw and pulse lasers have been applied in diverse space missions such as altimeters, LIDARs and inter-satellite ranging. Recently the advent of ultrashort pulse lasers have opened

new possibilities in the field of precision metrology through their superior characteristics of fine temporal resolution, high peak power, high repetition rate, high frequency stability and broad spectral bandwidth. In particular, femtosecond lasers offer unique characteristics in both the temporal and spectral terms, not observed in other cw or pulse lasers, permitting breakthroughs in precision metrology particularly in time, distance and spectroscopy. Motivated by the technological stimulus brought about by femtosecond lasers, much attention is being drawn to extend today's space missions by improving the precision of remote sensing and control capabilities.

• **Prof. Oliver Wright, Hokkaido University, Japan**



“Optoacoustic animation of surface acoustic waves”

Using a picosecond optoacoustic technique, we excite and image surface acoustic waves in confined geometries. The generated gigahertz waves are detected in particular in microscopic phononic crystals, waveguides, cavities and asymmetric structures with highly focused optical spots. Although the imaging is done in the time-domain, the data can also be viewed in the

frequency domain, in two-dimensional wave-vector space, or in group-velocity space. Curious and unexpected things happen to point-source excited surface waves even in a phononic structure as simple as a grating owing to the presence of caustics, arising from phononic stop bands, that concentrate the acoustic energy in certain directions. We show how the surface wave dispersion can be revealed by our technique.

Phononic crystals made by drilling microscopic holes in silicon substrates also provide a convenient platform for generic experiments on imaging wave-guiding or wave confinement, as do whispering gallery modes in minute two-dimensional cavities based on discs or phononic crystals. Optomechanical cavities exhibiting phononic-plasmonic coupling can also be imaged, such as arrays of gold nanodishes.

• **Prof. Kazuhiro Hane, Tohoku University, Japan**



“Optical Micro-Electro-Mechanical Systems: Silicon-based Integration for Optomechanics”

Integration of optical and mechanical components is important for micro-optomechanical systems, such as scanning laser display, optical pick-up, and fiber-optic switching system. Micro-Electronic-Mechanical Systems (MEMS) on the basis of silicon micromachining are promising for the

integration since the advanced silicon semiconductor micro-fabrication technology can be used. As well as silicon photo-sensors and electronic circuits, several optical components such as micro-mirror, micro-lens, optical waveguides, which are fabricated from silicon-based materials, are integrated on a silicon chip. In this talk, several optical components and optomechanical systems fabricated by silicon micromachining are introduced. Scanning micro-mirrors for sensing and display, optical sensors for mechatronics such as displacement encoder, silicon-photonic waveguide switches for optical telecommunication etc., are explained.

Read more abstracts at the website.