Oral Session

Session A
In-Process and Intelligent Measurement

Conference Room E1, COEX

September 18 Mon.   10:45~12:10

[A-1] In-Process Measurement - I

Chair. Prof. Ki-Nam Joo (Chosun University), Dr. Sungho Suh (Deutsches Forschungszentrum für Künstliche Intelligenz)

Invited
10:45~11:10
Current advances and challenges in optical metrology for advanced semiconductor packaging
Liang-Chia Chen
National Taiwan University (Taiwan)

A014
11:10~11:25
Vertical registration of in-process topography data with post-process volumetric data
Afaf Remani*, Fernando Peña, Arianna Rossi, Adam Thompson, John Dardis, Nick Jones, Nicola Senin, Richard Leach
* University of Nottingham (United Kingdom)

A203
11:25~11:40
One-wire reconfigurable and damage-tolerant sensor array
Zhihe Long, Zhengbao Yang*
* Hong Kong University of Science and Technology (China)

A106
11:40~11:55
An indirect spatial positioning method for black volute depalletizing system based on a RGB-D camera
Shuonan Xiao*, Ping Yang, Haiyang Lin, Qiming Zhong
* Xiamen University (China)

A126
11:55~12:10
Embedded algorithm for diagnosis of spindle bearings and machining problems
Chi Cong Dang*, Jooho Hwang
* Korea Institute of Machinery and Materials (South Korea)

September 18 Mon.   13:50~15:15

[A-2] In-Process Measurement - II

Chair: Dr. Seungman Kim (Korea Institute of Machinery and Materials)

Invited
13:50~14:15

Optical 3D inspection technologies

In Sung Kang
KOH YOUNG TECHNOLOGY, INC. (South Korea)

A131
14:15~14:30

In-process observation of physical phenomena inside the workpiece processed by water jet guided laser

Shoichi Ui*, Mayuko Osawa, Ryota Washio, Shotaro Kadoya, Masaki Michihata, Satoru Takahashi
* The University of Tokyo (Japan)

A048
14:30~14:45

Correlation analysis between molding conditions and demolding forces in injection molding

Tetsuya Ofusa*, Fuminobu Kimura, Yusuke Kajihara
* The University of Tokyo (Japan)

A136
14:45~15:00

Real-time measurement for multi-layer thin-film structure with micro-ellipsometry and pixelated polarizing camera

Dong-Geun Yang*, Young-Sik Ghim, Hyug-Gyo Rhee
* Korea Research Institute of Standards and Science (South Korea)

A191
15:00~15:15

In-process measurement of effective distance and bubble structure by high-speed imaging technique in optical cavitation

Saikat Medya*, Swee Hock Yeo
* Nanyang Technological University (Singapore)

September 18 Mon.   16:25~18:00

[A-3] Intelligent Measurement - I

Chair: Dr. Jiyong Park (Korea Institute of Industrial Technology), Dr. In Sung Kang (KOH YOUNG TECHNOLOGY)

Invited
16:25~16:50

Wafer-level metrology and inspection for advanced electronics packaging

ChaBum Lee
Texas A&M University (USA)

Invited
16:50~17:15

Remaining useful life prediction of lithium-ion batteries using spatio-temporal transformers

Sungho Suh
Deutsches Forschungszentrum für Künstliche Intelligenz (Germany)

A017
17:15~17:30

Buried patterns and defects see-through imaging by high-voltage SEM

Hang Zhao*, Shiyuan Liu, Jinlong Zhu
* Huazhong University of Science and Technology (China)

A150
17:30~17:45

Absolute distance measurement based on radio-frequency Interferometer using the method of excess fraction

Tao Liu*, Jiucheng Wu, Ryo Sato, Hiraku Matsukuma, Wei Gao
* Tohoku University (Japan)

A045
17:45~18:00

Measurement of wedge's global angular sizes based on parallel profile extraction strategy

Zexiang Zhao*, Xinyu Zhao, Jianpu Xi, Yixiang He, Guanghua Hua
* Zhongyuan University of Technology (China)

September 19 Tue.   10:45~12:10

[A-4] Intelligent Measurement - II

Chair. Dr. Young-Sik Ghim (Korea Research Institute of Standards and Science)

Invited
10:45~11:10
Simplified solutions in an increasingly complicated market
Chi Ho Ng
LMI Technologies (Canada)

A046
11:10~11:25
Stroboscopic sampling moiré microscope for investigation of MEMS' full surface in-plane vibration
Mona Yadi*, Tsutomu Uenohara, Yasuhiro Mizutani, Yoshiharu Morimoto, Yasuhiro Takaya
Osaka University (Japan)

A101
11:25~11:40
Research on the measurement method for the full-surface profile of micro curved workpiece
Zhonghao Cao*, Yuan-Liu Chen
Zhejiang University (China)

A115
11:40~11:55
Parameters quantification of subsurface detection technology based on probe ultrasonic excitation and discrimination of different materials
Yuyang Wang*, Yuan-Liu Chen, Mingyu Duan
Zhejiang University (China)

A102
11:55~12:10
Investigation on the resolution improvement of an optical angle sensor based on laser autocollimation
Hyunsung Lim, Yuki Shimizu*
Hokkaido University (Japan)

September 19 Tue.   14:00~15:15

[A-5] Intelligent Measurement - III

Chair. Dr. Seongheum Han (Korea Institute of Machinery and Materials), Prof. Yuan-Liu Chen (Zhejiang University)

A032
14:00~14:15
Tomographic imaging Mueller-matrix ellipsometry: Principle, instrumentation and emerging applications
Xiuguo Chen*, Chao Chen, Sheng Sheng, Shiyuan Liu
Huazhong University of Science and Technology (China)

A056
14:15~14:30
Vision-based pose measurement technology for mobile machine
Seungman Kim*. Gyungho Khim, Seongheum Han, Jeong Seok Oh, Seung-Kook Ro
Korea Institute of Machinery and Materials (South Korea)

A179
14:30~14:45
Automatic high-frequency induction brazing through an ensembled detection with heterogenous sensor measurements
Joonhyeok Moon*, Min-Gwan KIM, Ok Hyun Kang, Heejong Lee, Ki-Yong Oh
Hanyang University (South Korea)

A096
14:45~15:00
A novel calibration method for kinematic parameter errors of industrial robot based on Levenberg-Marquard and beetle antennae search algorithm
Mengyao Fan*, Huining Zhao, Liandong Yu, Haojie Xia
Hefei University of Technology (China)

A168
14:45~15:15
Novel multi-electromagnetic-force-compensation axis-symmetric mass comparator
Kyung-Taek Yoon*, Young-Man Choi
Ajou University (South Korea)

September 19 ^{Tue.}   15:40~16:55

[A-6] Intelligent Measurement - IV

Chair: Prof. Young-Man Choi (Ajou University), Prof. Jinlong Zhu (Huazhong University of Science and Technology)

A154
15:40~15:55

Design and implementation of AI-based computer vision system for quality control of product and processes

Miro Hegedić, Mihael Gudlin*, Matija Golec, Petar Gregurić, Borna Skrlec
University of Zagreb (Croatia)

A025
15:55~16:10

Straightness measurement with laser beam and deep learning

Satoru Takano*, Hibiki Takeoka, Koji Horie, Yohei Yamada, Toshinori Yasuhara, Kohsei Terao, Masato Aketagawa
Nagaoka University of Technology (Japan)

A066
16:10~16:25

Sinusoidal phase modulation interferometer using high speed phase demodulation and comb filter

Masato Higuchi*, Katsunari Katagiri, Taku Sato, Masato Aketagawa
Nagaoka University of Technology (Japan)

A166
16:25~16:40

Crack inspection in tunnel structures by fusing information from a 3D light detection and ranging and pan-tilt-zoom camera system

Siheon Jeong*, Min Gwan Kim, Ki-Yong Oh
Hanyang University (South Korea)

A034
16:40~16:55

Laser feedback FMCW LiDAR for noncooperative-target ranging with a stand-off distance of several hundred meters

Yifan Wang*, Yidong Tan
Tsinghua University (China)

Session B
Dimensional Metrology & Frequency Combs

Conference Room E2, COEX

September 18 ^{Mon.}	10:45~12:05

[B-1] Dimensional Metrology - I

Chair. Prof. Young-Jin Kim (Korea Advanced Institute of Science and Technology), Prof. Kai Ni (Tsinghua University)

Invited
10:45~11:10

Multi-wavelength interferometry for geodesy and large volume metrology
Florian Pollinger
Physikalisch-Technische Bundesanstalt (Germany)

Invited
11:10~11:35

Picometer displacement/length measurement using regular crystalline lattice and super-resolution interferometry
Masato Aketagawa
Nagaoka University of Technology (Japan)

A071
11:35~11:50

Synchronization of distant frequency combs via 1.3-km free-space optical frequency transfer
Dong Il Lee*, Jaewon Yang, Dong-Chel Shin, Jaehyun Lee, Seung-Woo Kim, Young-Jin Kim
* Korea Advanced Institute of Science and Technology (South Korea)

A122
11:50~12:05

Frequency modulation control using heterodyne ineterferometer for FMCW LiDAR
Jubong Lee*, Youngjun Cho, Kyihwan Park
* Gwangju Institute of Science and Technology (South Korea)

September 18 Mon.   13:50~15:10

[B-2] Frequency Comb - I

Chair: Prof. Kaoru Minoshima (University of Electro-Communications), Dr. Laura Sinclair (National Institute of Standards and Technology)

Invited
13:50~14:15

Dual-comb-based distance and multi-degree-of-freedom measurements

Guanhao Wu
Tsinghua University (China)

Invited
14:15~14:40

Time-of-flight measurement of micro-structures based on electronically controlled optical sampling

Youjian Song
Tianjin University (China)

A051
14:40~14:55

Development and applications of the dual-comb absolute distance measurement

Seongheum Han*, Seungman Kim, Jeong-Seok Oh, Gyungho Khim, Seung-Kook Ro, Seung-Woo Kim
* Korea Institute of Machinery and Materials (South Korea)

A081
14:55~15:10

Absolute distance measurement based on time-of-flight via high-efficiency optical cross-correlation using a semiconductor optical amplifier

Jaeyoung Jang*, Young-Jin Kim, Seung-Woo Kim
* Korea Advanced Institute of Science and Technology (South Korea)

September 18 Mon.   16:25~18:00

[B-3] Frequency Comb - II

Chair: Prof. Guanhao Wu (Tsinghua University), Prof. Takashi Kato (University of Electro-Communications)

Invited
16:25~16:50

Dual-comb spectroscopy extended for spatiotemporal measurement applications using OAM light

Akifumi Asahara
University of Electro-Communications (Japan)

Invited
16:50~17:15

Dual-comb spectroscopy and ranging based on mechanical sharing mode-locked fiber lasers

Kai Ni
Tsinghua University (China)

A035
17:15~17:30

Frequency-comb based phase spectroscopy for surface plasmon polariton phase change detection on nano structure

Dae Hee Kim*, Young Ho Park, In Jae Lee, Jun Hyung Park, Young-Jin Kim
* Korea Advanced Institute of Science and Technology (South Korea)

A078
17:30~17:45

Polarization-multiplexed dual-comb fiber laser with dual-phase-biased nonlinear amplifying loop mirror

Jiayang Chen*, Yuxuan Ma, Liheng Shi, Guanhao Wu
* Tsinghua University (China)

A104
17:45~18:00

Improvement of the resolution of pitch deviation measurement of a diffraction scale grating by optical angle sensors

Tomoki Kitazume, Wei Gao, Yuki Shimizu*
* Hokkaido University (Japan)

September 19 Tue.   10:45~12:05

[B-4] Dimensional Metrology - II

Chair: Dr. Florian Pollinger (Physikalisch-Technische Bundesanstalt), Dr. Seongheum Han (Korea Institute of Machinery and Materials)

Invited
10:45~11:10
Ultrafast holographic microscopy based on fs laser for wavefront inspection and biological applications
Yang Lu
China University of Petroleum (UPC) (China)

Invited
11:10~11:35
Real-time suppression of random phase drift for optical frequency comb ranging with high-frequency intermode beats
Ruitao Yang
Harbin Institute of Technology (China)

A128
11:35~11:50
An absolute angle measurement based on the interference of a mode-locked femtosecond laser in a Fabry-Pérot etalon
Dong Wook Shin*, Ryo Sato, Hiraku Matsukuma, Wei Gao
* Tohoku University (Japan)

A120
11:50~12:05
A capacitive absolute angular displacement sensor based on dual re-modulation scheme with time-division multiplexing
Bingnan Zhan*, Changliang Wu, Pei Huang, Xiaokang LiuPei, Hongji Pu
* Beijing Institute of Technology (China)

September 19 Tue.   14:00~15:20

[B-5] Frequency Comb - III

Chair: Prof. Joohyung Lee (Seoul National University of Science and Technology),
Prof. Akifumi Asahara (University of Electro-Communications)

Invited
14:00~14:25
Optical phased array with phase-controlled optical frequency comb
Takashi Kato
University of Electro-Communications (Japan)

Invited
14:25~14:50
Generation of non-divergent surface third-harmonics with a two-photon-polymerized phase-type diffractive micro axicon
Jiao Jiannan
Shenzhen University (China)

A061
14:50~15:05
Spatial beam shaping of ultraviolet via phase control of near-infrared fundamental beam in harmonic generation
Seungjai Won*, Seungman Choi, Taewon Kim, Byunggi Kim, Seung-Woo Kim, Young-Jin Kim
* Korea Advanced Institute of Science and Technology (South Korea)

A010
15:05~15:20
High-precision terahertz continuous-wave spectroscopy with frequency comb calibration
Guseon Kang*, Jaeyoon Kim, Dong-Chel Shin, Seong-Woo Kim, Young-Jin Kim
* Korea Advanced Institute of Science and Technology (South Korea)

September 19 ^{Tue.}   15:40~17:05

[B-6] Uncertainty, Traceability & Calibration

Chair: Prof. Masato Aketagawa (Nagaoka University of Technology), Prof. Youjian Song (Tianjin University)

Invited
15:40~16:05

A capacitor coupling-based instrument to assess in a more reliable way the quality of insulation in mass-produced electric stators and motors

Matteo Bosi
Marposs Korea (Italy)

A001
16:05~16:20

Uncertainty estimation and validation method of surface roughness measurement on coordinate measuring machine using photometric stereo method

Thammarat Somthong*, Qing-Ping Yang, Jariya Buajarern
* National Institute of Metrology (Thailand)

A021
16:20~16:35

Virtual optical instrument for uncertainty evaluation in surface topography measurement

Helia Hooshmand*, Athanasios Pappas, Rong Su, Richard Leach, Samanta Piano
* University of Nottingham (United Kingdom)

A107
16:35~16:50

Determination of the influence of environmental vibration on the evaluation of measurement noise using a virtual instrument

Athanasios Pappas*, Helia Hooshmand, Rong Su, Richard Leach, Samanta Piano
* University of Nottingham (United Kingdom)

A076
16:50~17:05

Development of a differential angle sensor for evaluation of scale pitch deviation

Jiucheng Wu*, Lue Quan, Ryo Sato, Hiraku Matsukuma, Yuki Shimizu, Wei Gao
* Tohoku University (Japan)

Session C
Optical Interferometry, Metrology & Inspection

Conference Room E3, COEX

September 18 Mon.	10:45~12:05

[C-1] Optical Interferometry - I

Chair: Dr. Joonho You (Nexsensor), Dr. Byoung-Ho Lee (Hitachi High-tech)

Invited
10:45~11:10
Massive overlay metrology solution by realizing imaging Mueller matrix spectroscopic ellipsometry
Taejoong Kim
Samsung Electronics (South Korea)

Invited
11:10~11:35
Deflectometry and Interferometry
Daewook Kim
University of Arizona (USA)

A097
11:35~11:50
The study of interferometric technologies for the advanced packaging of the semiconductor manufacturing process
Joonho You*, Chang Soo Kim
* nexensor Inc. (South Korea)

A005
11:50~12:05
Simultaneous phase-shifting circular subaperture stitching interferometry based on polarization grating
Yao Hu, Zhen Wang*, Qun Hao
* Beijing Institute of Technology (China)

September 18 Mon.   13:50~15:10

[C-2] Optical Interferometry - II

Chair: Prof. Daewook Kim (University of Arizona), Dr. Byung-Seon Chun (Nanoscope Systems)

Invited
13:50~14:15

Advancements in non-null surface figure measurement interferometry

Martin Tangari Larrategui
University of Arizona (USA)

Invited
14:15~14:40

Quantitative phase imaging for dynamic processes

Jindong Tian
Shenzhen University (China)

A067
14:40~14:55

Multi-channel vibration measurement based on self-mixing vertical cavity surface-emitting lasers

Wei Xia*, Mengna Xu, Jingyu Yu, Dongmei Guo, Ming Wang
* Nanjing Normal University (China)

A105
14:55~15:10

Stitching interferometry method for the pitch evaluation of a large-scale variable-line-spacing diffraction grating by using a Fizeau interferometer

Chenguang Yin*, Xin Xiong, Ryo Sato, Hiraku Matsukuma, Wei Gao
* Tohoku University (Japan)

September 18 Mon.   16:25~17:30

[C-3] Metrology & Inspection - I

Chair: Dr. Taejoong Kim (Samsung Electronics), Dr. Martin Tangari Larrategui (University of Arizona)

Invited
16:25~16:50

Thermoreflectance microscopy for steady-state and transient thermal analysis of electronic devices in microscopic scale

Byung-Seon Chun
Nanoscope Systems, Inc. (South Korea)

Invited
16:50~17:15

MI (Metrology & Inspection): essential technology for future devices

Byoung-Ho Lee
Hitachi High-tech (Japan)

A103
17:15~17:30

In-situ evaluation of interference fringe patterns generated by non-orthogonal Lloyd's mirror interferometer

Nozomu Takahiro, Yuki Shimizu*
* Hokkaido University (Japan)

September 19 Tue.   10:45~12:05

[C-4] Microscopy & Profilometry - I

Chair: Dr. Jaehyun Lee (Korea Research Institute of Standards and Science), Prof. Rongke Gao (China University of Petroleum (UPC))

Invited
10:45~11:10

Super resolution optical measurement for functional microstructures beyond the diffraction limit

Satoru Takahashi
The University of Tokyo (Japan)

Invited
11:10~11:35

Tissue culture monitoring using line-field fluorescence microsocpy combined with optical coherence microscopy

Kye-Sung Lee
Korea Basic Science Institute (South Korea)

A018
11:35~11:50

Super-resolution and optical phase retrieval using ptychographic structured illumination microscopy

Keichi Kuwae, Shin Usuki*, Tadatoshi Sekine, Kenjiro T. Miura
* Shizuoka University (Japan)

A116
11:50~12:05

Investigation of angle measurement based on confocal probe employing second harmonic generation

Ryo Sato*, Yuki Shimizu, Hiraku Matsukuma, Wei Gao
* Tohoku University (Japan)

September 19 Tue.   14:00~15:20

[C-5] Metrology & Inspection - II

Chair: Prof. Satoru Takahashi (The University of Tokyo), Dr. Jaehyun Lee (Korea Research Institute of Standards and Science)

Invited
14:00~14:25

Learning based fringe projection profilometry

Chao Zuo
Nanjing University of Science and Technology (China)

Invited
14:25~14:50

The SERS measurements on micro-nano interface substrate integrated microfluidic biosensor

Rongke Gao
China University of Petroleum (UPC) (China)

A006
14:50~15:05

Single-shot deflectometry for dynamic measurement of specular surfaces using high carrier-frequency diagonal pattern

Manh The Nguyen*, Jaehyun Lee, Young-Sik Ghim, Hyug-Gyo Rhee
* Korea Research Institute of Standards and Science (South Korea)

A042
15:05~15:20

Measurement of global sizes of cylinder based on spiral profile extraction strategy

Xinyu Zhao*, Jianpu Xi, Zexiang Zhao, Xinchao Shi, Shuaifei Wang
* Zhongyuan University of Technology (China)

September 19 Tue.   15:40~17:05

[C-6] Microscopy & Profilometry - II

Chair: Dr. Sangwon Hyun (Korea Basic Research Institute), Dr. Kye-Sung Lee (Korea Basic Science Institute)

Invited
15:40~16:05

Real-time monitoring of airborne microbial colony forming unit based on on-chip cell imaging platform with continuous aerosol-to-hydrosol transfer

Ki Joon Heo
Chonnam National University (South Korea)

A134
16:05~16:20

Parallel computation using a whale optimization algorithm for faster misalignment estimation in reflective Fourier ptychography microscopy

Van Huan Pham*, Byong Hyuk Chon, Hee Kyung Ahn
* Korea Research Institute of Standards and Science (South Korea)

A175
16:20~16:35

Misalignment evaluating and compensating for freeform optical system using CMM

Jimin Han*, Hojae Ahn, Joong Kyu Ham, Geon Hee Kim, Bongkon Moon, Woojin Park, Seung-Wook Park, Dae-Hee Lee, Soojong Pak
* Kyung Hee University (South Korea)

A028
16:35~16:50

Form error measurement of CMM probe tip ball based on interpolation method

So Ito*, Daisuke Yamashita, Shiori Toyomoto, Kouki Tsuchida, Kimihisa Matsumoto, Kazuhide Kamiya
* Toyama Prefectural University (Japan)

A079
16:50~17:05

New galvo-scanned chromatic confocal microscopy for accurate full-field surface profilometry

Yu-Feng Chou, Wei-Chi Hung*, Han-Ju Tsai, Fu-Sheng Yang, Liang-Chia Chen
* National Taiwan University (Taiwan)

Session D
Material Processing & Characterization, Sensors and Actuators

Conference Room E4, COEX

| September 18 ^{Mon.} | 10:45~12:05 |

[D-1] Laser Material Processing - I

Chair. Dr. Hyungcheoul Shim (Korea Institute of Machinery and Materials),
Dr. Han Ku Nam (Korea Advanced Institute of Science and Technology)

Invited
10:45~11:10
Ultrafast laser processing for advanced packaging of glass-based devices
Jiyeon Choi
Korea Institute of Machinery & Materials (South Korea)

Invited
11:10~11:35
Laser processing of graphene materials for high-performance energy storage devices
Soongeun Kwon
Korea Institute of Machinery & Materials (South Korea)

A112
11:35~11:50
Graphene-assisted laser lift-off for clean delamination of ultra-thin polyimide film
Sumin Kang*, Jaeseung Lim, Seung Man Kim, Ah-Young Park, Seongheum Han, Jae Hak Lee, Jub-Yeob Song
* Korea Institute of Machinery and Materials (South Korea)

A016
11:50~12:05
Maskless 3D fabrication based on laser-induced chemical etching
Pan Peng*, Xinqin Liu, Shiyuan Liu, Jinlong Zhu
* Huazhong University of Science and Technology (China)

September 18 Mon.   13:50~15:10

[D-2] Laser Material Processing - II

Chair: Dr. Jiyeon Choi (Korea Institute of Machinery and Materials), Dr. Soongeun Kwon (Korea Institute of Machinery and Materials)

Invited
13:50~14:15

Laser-patterned energy storage devices integrated with wearable electronics

Sangbaek Park
Chungnam National University (South Korea)

Invited
14:15~14:40

Advanced characterization of the active materials for lithium ion batteries using TEM techniques to promote mechanism understanding

Hyung Cheoul Shim
Korea Institute of Machinery & Materials (South Korea)

A008
14:40~14:55

Fabrication of optical patterns using laser-induced graphene in colorless polyimide

Younggeun Lee*, Dongwook Yang, Han Ku Nam, Young-Ryul Kim, Hyogeun Han, Seunghwan Kim, Truong-Son Dinh Le, Hongki Yoo, Hyosang Yoon, Joohyung Lee, Young-Jin Kim
* Korea Advanced Institute of Science and Technology (South Korea)

A026
14:55~15:10

Laser-induced graphene formation on woods for smart green electronics applications

Han Ku Nam*, Dongwook Yang, Younggeun Lee, Truong-Son Dinh Le, Young-Ryeul Kim, Tongmei Jing, Manping Wang, Seung-Woo Kim, Young-Jin Kim
* Korea Advanced Institute of Science and Technology (South Korea)

September 18 Mon.   16:25~17:50

[D-3] Material Characterization

Chair: Prof. Seunghwoi Han (Chonnam National University), Dr. Seungman Kim (Korea Institute of Machinery and Materials)

Invited
16:25~16:50

Nano scale physical and chemical property characterization by scanning probe techniques

Wanxin Sun
Bruker Singapore Pte Ltd. (Singapore)

A172
16:50~17:05

Characterization of the mechanical properties of amorphous NiTi thin film for stretchable display electrodes

Ah-Young Park*, Sumin Kang, Hakyung Jeong, Jun-Yeob Song, Seungman Kim, Seongheum Han, Jae Hak Lee
* Korea Institute of Machinery and Materials (South Korea)

A065
17:05~17:20

Passive near-field detection of dielectric materials near the surface phonon-polariton wavelength

Ryoko Sakuma*, Kuan-Ting Lin, Yusuke Kajihara
* The University of Tokyo (Japan)

A178
17:20~17:35

Mechanical property evaluation of a copper thin film using the surface acoustic wave spectrometry

Yun Young Kim*, Taehyeong Kim
* Chungnam National University (South Korea)

A099
17:35~17:50

Thermal measurement on biased graphene wires by measuring the thermally excited evanescent wave

Ryoya Sugimura*, Kuan-Ting Lin, Ryoko Sakuma, Fuminobu Kimura, Yusuke Kajihara
* University of Tokyo (Japan)

September 19 Tue.   10:45~11:45

[D-4] Sensors & Actuators

Chair: Prof. Sangbaek Park (Chungnam National University), Dr. Ah-Young Park (Korea Institute of Machinery and Materials)

A047
10:45~11:00

ZnO-PTFE based antimicrobial, hydrophobicity, anti-reflective display coatings, and high-sensitivity touch sensor

Swathi Ippili, Venkatraju Jella, Jeong Min Lee, Jang-Su Jung, Soon-Gil Yoon*
Chungnam National University (South Korea)

A009
11:00~11:15

Femtosecond-laser-induced graphene formation on textile for e-textile applications

Dongwook Yang*, Han Ku Nam, Youonggeun Lee, Young-Ryeul Kim, Le Dinh Truong Son, Seung-Woo Kim, Young-Jin Kim
Korea Advanced Institute of Science and Technology (South Korea)

A125
11:15~11:30

An experimental analysis of multi sensor's performance degradation in harsh driving environment

Junseok Heo*, Byeongjun Im, Sungjae Shin, Se-Eun Ha, Seunghwoi Han
Chonnam National University (South Korea)

A124
11:30~11:45

Laser-induced Micro-LED transfer process

Jaeseung Lim, Sumin Kang, Seongheum Han, Ah-Young Park, Jae-Hak Lee, Jun-Yeob Song, Sangseon Lee, Rakibul Islam, Seungman Kim, Seunghwoi Han*
Chonnam National University (South Korea)

Session E
Precision Metrology & Optical Inspection

Conference Room E4~5, COEX

September 18 ^{Mon.}   Room E5 / 10:45~12:00

[E-1] Precision Metrology - I

Chair: Dr. Byung Jae Chun (Korea Atomic Energy Research Institute), Dr. Keunwoo Lee (LASERNGRAPN)

A022
10:45~11:00

Principle verification of grating encoder using multi diffracted light through circular optical system

Soki Fujimura*, Shotaro Kadoya, Masaki Michihata, Satoru Takahashi
University of Tokyo (Japan)

A004
11:00~11:15

Measurement of gear integrated error based on improved Zernike moment

Yiming Fang*, Zhaoyao Shi
Beijing University of Technology (China)

A090
11:15~11:30

A surface encoder with an improved Z-range and reduced crosstalk errors

Yifan Hong*, Yuki Shimizu, Hiraku Matsukuma, Wei Gao
Tohoku University (Japan)

A170
11:30~11:45

Absolute optical rotary encoder with multiple focusing spots and autofocusing

Hsi-Fu Shih*, Wei-Lun Lo, Hung Huang
National Chung Hsing University (Taiwan)

A086
11:45~12:00

Spectroscopic ellipsometry for ultra-thin film with sub-10 nm thickness

Honggang Gu*, Shiyuan Liu
Huazhong University of Science and Technology (China)

September 18 Mon.   Room E5 / 13:50~15:05

[E-2] Precision Metrology - II

Chair: Prof. Jae-Sang Hyun (Younsei University), Heesuk Jang (Agency for Defense Development)

A196
13:50~14:05
A high-SNR fiber interferometer using phase modulation for precise displacement measurement
Chen-Yu Liao, Jia-Hong Chen, Fu-Sheng Yang*, Chin-Yu Hsieh, Hsi-Hui Lin, Liang-Chia Chen
National Taiwan University (Taiwan)

A007
14:05~14:20
Exposure-induced optical responses in UV photoresist using spectroscopic ellipsometry
Jiamin Liu*, Lei Li, Hao Jiang, Shiyuan Liu
Huazhong University of Science and Technology (China)

A033
14:20~14:35
Improving period accuracy of planar diffraction gratings fabricated in a Lloyd's mirror exposure system
Shen Sitong*, Zeng Lijiang
Tsinghua University (China)

A129
14:35~14:50
Conductive carbon nanowire produced by using femtosecond laser irradiation with acetylene gas
Rakibul Islam*, Sangseon Lee, Seungsik Shin, Jaeseung Lim, Daeseop Kim, Seongwon Choi, Seunghwoi Han
Chonnam National University (South Korea)

A156
14:50~15:05
Predicting the critical dimensions of HAR TSV structures using joint training models and electromagnetic simulation tools
Jia-Wei Li, Chong-Han Hsu, Jiao-Kai Wang, Bo-En Tsai, Yong-Jing Su, Chao-Ching Ho*
National Taipei University of Technology (Taiwan)

September 19 Tue.   Room E4 / 14:00~15:25

[E-3] Precision Metrology - III

Chair: Prof. Seunghwoi Han (Chonnam National Unviersity), Dr. Wanxin Sun (Bruker Singapore Pte Ltd.)

Invited
14:00~14:25
Automated nano-metrological AFM with intelligent data preparation
Sang-Joon Cho
Park Systems (South Korea)

A077
14:25~14:40
Dual-beam laser feedback interferometer for displacement and rotation measurement
Xin Xu*, Yu Wang, Yidong Tan
Tsinghua University (China)

A190
14:40~14:55
Development of wafer align and pre-bonding system for wafer level hybrid bonding
Hakjun Lee
Korea Institute of Industrial Technology (South Korea)

A198
14:55~15:10
Roll angular displacement measurement with Polarization Interferometry
Shu-Han Chang*, Ching-Tse Hsu, Wun-Yan Chen, Ju-Yi Lee
National Central University (Taiwan)

A144
15:10~15:25
Improvement approach for accuracy of combined vision measurement based on coupling measurement pose optimization
Ronghui Guo*, Haihua Cui
Nanjing University of Aeronautics and Astronautics (China)

[E-4] Precision Metrology - IV

Chair: Dr. Sang-Joon Cho (Park Systems), Prof. Hao Jiang (Huazhong University of Science and Technology)

A039
15:40~15:55

Roughness analysis method of lateral shearing interferometry using polarization grating

Hyo Mi Park*, Luke D. Mayer, Daewook Kim, Ki-Nam Joo
Chosun University (South Korea)

A023
15:55~16:10

A study on point cloud to CAD model alignment method based on gear optical measurement

Hao Lv*, Zhaoyao Shi
Beijing University of Technology (China)

A202
16:10~16:25

High-speed 3D surface measurement with cylindrical-shaped mechanical projector

Mincheol Choi, Gaeun Kim, Jae Sang Hyun*
Yonsei University (South Korea)

A100
16:25~16:40

An angle sensor based on second harmonic generation in transmission of a collimated femtosecond beam

Jiahui Lin*, Kuangyi Li, Zhiyang Zhang, Ryo Sato, Hiraku Matsukuma, Wei Gao
Tohoku University (Japan)

A199
16:40~16:55

Analysis of through silicon via sidewall etch parameters variation using FDTD simulation

Saurav Gautam, Shih-Wen Chen, Chao-Ching Ho*
National Taipei University of Technology (Taiwan)

Session F
Machine Learning & Signal Processing

Conference Room E5, COEX

September 18 Mon.   **16:25~17:50**

[F-1] Machine Learning & Signal Processing I

Chair: Dr. Jeong Seok Oh (Korea Institute of Machinery and Materials), Prof. Liang-Chia Chen (National Taiwan University)

Invited
16:25~16:50

Virtual reality based human-machine interface for human-AI collaboration

Huitaek Yun
Korea Advanced Institute of Science and Technology (South Korea)

A013
16:50~17:05

Efficient method for measuring 21 geometric errors and identifying key errors for three linear axes of machine tools

Fajia Zheng*, Qibo Feng, Yuqiong Zhao, Bin Zhang, Jiakun Li, Fei Long
* Beijing Jiaotong University (China)

A059
17:05~17:20

Single-frame phase extraction for measuring geometric properties of optical components based on deep learning

Jurim Jeon*, Yangjin Kim, Naohiko Sugita
* Pusan National University (South Korea)

A054
17:20~17:35

A unified approach for simulating the volumetric errors of three-axis machine tools of all possible configurations

Quoc-Khanh Nguyen*, Gyungho Khim, Seung-Kook Ro, Jeong Seok Oh
* Korea Institute of Machinery and Materials (South Korea)

A058
17:35~17:50

Error averaging mechanism of multi-row ball bearing spindle

Shuang-shuang Zhang*, Hong-Tao Yang
* Anhui University of Science and Technology (China)

September 19 Tue.   10:45~12:10

[F-2] Machine Learning & Signal Processing II

Chair. Prof. Huitaek Yun (Korea Advanced Institute of Science and Technology), Dr. Sangwon Hyun (Korea Basic Research Institute)

Invited
10:45~11:10
Deep learning-based stress intensity factors analysis of bi-material interface crack from photoelastic images

Dong-Wook Lee
Technology Innovation Institute (United Arab Emirates)

A049
11:10~11:25
Precise energy distribution measurement of electron source with high performance compact lens-type energy analyzer

Ha Rim Lee*, Junhyeok Hwang, Takashi Ogawa, Haewon Jung, Dal-Jae Yun, Jisoo Kim, Sangsun Lee, In-Yong Park
* Korea Research Institute of Standards and Science (South Korea)

A062
11:25~11:40
Instance segmentation using mask R-CNN for object extraction and background removal in a complex photogrammetry system

Mingda Harvey Yang*, Adam Thompson, Sofia Catalucci, David T Branson III, Samanta Piano
* University of Nottingham (United Kingdom)

A082
11:40~11:55
Wavefront sensing and Control using an approximate point-spread function model in the sensorless adaptive optics

Jinsung Kim, Hwan Hur*
* Korea Basic Science Institute (South Korea)

A043
11:55~12:10
Measurement of nano-thickness distribution of lubricant film in tool-work interface using fluorescence

Motoya Yoshikawa*, Shotaro Kadoya, Masaki Michihata, Satoru Takahashi, Tatsuya Sugihara
* The University of Tokyo (Japan)

September 19 Tue.   14:00~15:25

[F-3] Machine Learning & Signal Processing III

Chair. Prof. Yangjin Kim (Pusan National University)

Invited
14:00~14:25
Universal denoising method for boosting the throughput of semiconductor image metrology

Ilkoo Kim
Gauss Labs (USA)

A098
14:25~14:40
The application of neural network for angle measurement based on second harmonic generation

Zhiyang Zhang*, Kuangyi Li, Jiahui Lin, Ryo Sato, Hiraku Matsukuma, Wei Gao
* Tohoku University (Japan)

A149
14:40~14:55
Anomaly detection of underground transmission-line connectors through multiscale mask DCNN and statistical image enhancement

Min Gwan Kim*, Siheon Jeong, Seok-Tae Kim, Ki-Yong Oh
* Hanyang University (South Korea)

A155
14:55~15:10
Real-time dynamic intelligent image recognition and tracking system for rockfall disasters

Yu-Wei Lin, Chu-Fu Chiu, Bo-En Tsai, Li-Hsien Chen, Chao-Ching Ho*
* National Taipei University of Technology (Taiwan)

A162
15:10~15:25
Deep learning-based 3D printing metal powder classification

Jide Obeyanji*, Dong-Wook Lee, Prabakaran Balasubramanian, Heungjo An, Tae Yeon Kim, Sung Mun Lee
* Technology Innovation Institute (United Arab Emirates)

September 19 Tue.   15:40~16:50

[F-4] Machine Learning & Signal Processing IV

Chair: Dr. In-Yong Park (Korea Research Institute of Standards and Science)

Invited
15:40~16:05
Designing and exploring super functional materials and devices using evolutionary and deep learning methods

In Ho Lee
Korea Research Institute of Standards and Science (South Korea)

A195
16:05~16:20
An AI-powered diffraction imaging approach for optical critical dimension metrology

Fu-Sheng Yang, Yen-Hung Hung*, Min-Ru Wu, Zih-Ying Fu, Chen-Yu Liao, Liang-Chia Chen
* National Taiwan University (Taiwan)

A161
16:20~16:35
Deep learning based identifying impact location on plate using wavelet transform

Jide Obeyanji*, Dong-Wook Lee, Prabakaran Balasubramanian, Heungjo An, Tae Yeon Kim, Sung Mun Lee
* Technology Innovation Institute (United Arab Emirates)

A084
16:35~16:50
Super-resolution imaging of sub-diffraction-limited pattern with superlens based on deep learning

Yizhao Guan*, Shuzo Masui, Shotaro Kadoya, Masaki Michihata, Satoru Takahashi
* The University of Tokyo (Japan)