

Oral Presentation

July 4 (Wednesday)

Precision Manufacturing Processes 1

Room 1 (107)

Session Chair: Mu-Tian Yan(National Chin-Yi University of Technology)

- | | | |
|-------------|------------------|---|
| 09:20-09:40 | OP001 004 | <p>Study on Productivity Improvement of Fpso Topside Modules by Using Process Mining Method</p> <p>Jae-chul Lee(Gyeongsang National University),
 Soon-sup Lee(Gyeongsang National University),
 Eun-ha-su Lee(Gyeongsang National University),
 Seon Yeob Kim(Gyeongsang National University),
 Sung-chul Shin(Pusan National University),
 Youngjun Yang(Tongmyong University)</p> |
| 09:40-10:00 | OP002 015 | <p>Experimental Analysis of the Effect of Tool Material Grain Size on Cutting Temperature</p> <p>Farooq Ahmed(Yeungnam University),
 TaeJo Ko(Yeungnam University),
 Jihyeon Byeon(Yeungnam University),
 Jongmin Lee(Yeungnam University)</p> |
| 10:00-10:20 | OP003 019 | <p>Real-time Milling Error Compensation for Thin-walled Parts Considering Geometric Error and Tool-workpiece Deformation</p> <p>Zhengchun Du(Shanghai Jiaotong University),
 Guangyan Ge(Shanghai Jiaotong University),
 Chengjie Gu(Shanghai Jiaotong University),
 Hongfu Hou(Shanghai Jiaotong University),
 Jianguo Yang(Shanghai Jiaotong University)</p> |
| 10:20-10:40 | OP004 071 | <p>Improvement of Wire Electrical Discharge Machining Characteristics in Machining Boron-doped Polycrystalline Diamond Using a Novel Iso-pulse Generator</p> <p>Mu-Tian Yan(National Chin-Yi University of Technology),
 Yu-Chih Cheng(Huafan University),
 Shenq-Yih Luo(Huafan University)</p> |

MIRAI Annual Session 1**Room 2 (108)**

- 09:00-09:20 **A001** Development of the Electric Rust Preventive Machining Method System
– Advanced Green Factory and Clean Ultra Precision Machining with the Water
Machining –
Naohiro Nishikawa(Iwate University)
- 09:20-09:40 **A002** Chemical Activation using Minimum Quantity Slurry Mist in Cu CMP
Haedo Jeong(Busan University)
- 09:40-10:00 **A003** Development of ELID Grinding Wheel Using 3D Printer
Yuki Mashiko(Ibaraki University)
- 10:00-10:20 **A004** Development of Grinding Wheels Made of Fibers Containing Abrasive Grains Using
Electrospinning Mode of PELID
Kazuki Shimizu(Ibaraki University)
- 10:20-10:40 **A005** Effect of Nano-diamond on Polishing to reduce Grinding Marks
Hitoshi Ohmori(RIKEN/Saitama University)

Materials 1		Room 3 (206)	
Session Chair: Weixiao Du (China Academy of Machinery Science & Technology)			
09:00-09:20	OP014	490	Self-supporting Nanofilm of Polymer Around a Graphitic Scaffold Towards Environmental Sustainability and Sustainable Industrialization Hyung Gyu Park(Swiss Federal Institute of Technology (ETH) Zurich)
09:20-09:40	OP015	143	Relationship Between Microstructure Change and Fatigue Life of Rubber Material of Tire Side Wall by Accelerated Aging NAMGYU JUN(Sungkyunkwan University), Chang-Sung Seok(Sungkyunkwan University), Byungwoo Moon(Sungkyunkwan University), Soo Park(Sungkyunkwan University), Jongmin LEE(Sungkyunkwan University)
09:40-10:00	OP016	208	Multi-scale Probabilistic Analysis for Mechanical Properties of Carbon/epoxy Laminates Using Homogenization Method and Monte Carlo Simulation Byung-Wook Jeon(Korea Institute of Carbon Convergence Technology), Ki-Weon Kang(Kunsan National University), Chan-Woong Choi(Kunsan National University), Yun-Jung Jang(Kunsan National University), Seung-Pyo Lee(ILJIN Global)
10:00-10:20	OP017	265	MoS₂-Graphene Hybrid Supercapacitor Prepared by Dry Spray Coating Mohaned Mohammed Mahmoud Mohammed(University of Ulsan), Doo-Man Chun(University of Ulsan)
10:20-10:40	OP018	300	Enhancement of Mechanical Properties of Nanocellulose Fiber-reinforced Composites by Stretching Treatment Hitoshi Takagi(Tokushima University), Antonio Nakagaito(Tokushima University), Yuya Sakaguchi(Tokushima University)

Precision Engineering 1**Room 4 (207)****Session Chair: Chunhui Chung**(National Taiwan University of Science and Technology)

- 09:20-09:40 **OP029** 007 **On-Machine Measurement for Surface Flatness of A Flexible Substrate in Laser Ablation Process**
HyungTae Kim(Korea Institute of Industrial Technology),
Yoon Jae Moon(Korea Institute of Industrial Technology),
Heuseok Kang(Korea Institute of Industrial Technology),
Jun Young Hwang(Korea Institute of Industrial Technology)
- 09:40-10:00 **OP030** 008 **Analyses of Cutting Forces and Vibration Signals When Turning with Tool Inserts with Integrated Chip-breaker Geometry**
Eric Dimla(RMIT University Vietnam)
- 10:00-10:20 **OP031** 018 **A Comparative Study on Estimation Methods of Ocean Wave Height Based on X-band Marine Radar**
Young Jun Yang(Tongmyong University),
Jae-chul Lee(Gyeongsang National University)
- 10:20-10:40 **OP032** 156 **Safety Assessment Methodology of Autonomous Emergency Braking Vehicle in Case of Cut-in Situations**
Sanghyeop Park(Kookmin University),
Seohang Lee(Kookmin University),
Wooyeong Jang(Kookmin University),
Yeonggeol Park(Kookmin University),
Jayil Jeong(Kookmin University)

Organized Session**Room 5 (102)****Additive Manufacturing – State of the Art 1****Session Chair: Dong Gyu Ahn(Chosun University)**

- 09:20-09:40 **OP039** 021 **Direct Fabrication of 3D Composite Meso-scale Part: from Dimensional Control to Precision Industrial Assembly**
YU LIU(Jiangnan University)
- 09:40-10:00 **OP040** 073 **Rapid Process Modeling of the Aerosol Jet Printing Based on Gaussian Process Regression with Latin Hypercube Sampling**
Seung Ki Moon(Nanyang Technological University),
Haining Zhang(Nanyang Technological University),
Teck Hui Ngo(SMRT Trains Pte Ltd.),
Junjie Tou(SMRT Trains Pte Ltd.),
Ashrof Bin Mohamed Yusoff Mohamed(SMRT Trains Pte Ltd.)
- 10:00-10:20 **OP041** 094 **Development of New Additive Manufacturing System Using Laser Based Digital Light Processing (DLP)**
Hoa Nguyen(Michigan State University),
Haseung Chung(Michigan State University),
Pil-Ho Lee(Michigan State University),
Patrick Kwon(Michigan State University)
- 10:20-10:40 **OP042** 201 **Investigation of Synergistic Application of Modulation Assisted Machining (MAM) and Nanoplatelet-enhanced Minimum Quantity Lubrication (nMQL) in Turning Ti-6Al-4V Alloy**
Patrick Kwon(Michigan State University),
Dihn Nguyen(Michigan State University),
Juan Sandoval(Michigan State University),
Kyung-Hee Park(Korea Institute of Industrial Technology),
Yang Guo(Michigan State University)

Precision Manufacturing Processes 2

Room 1 (107)

Session Chair: Geon Hee Kim(Korea Basic Science Institute)

- 13:10-13:40 **Keynote Speech 1** **Development of Unique Auxetic Structures for Improved Performance in Shock Absorption and Dissipation**
Chulho Yang(Oklahoma State University)
- 13:40-14:00 **OP005** 140 **Parameter Optimization in Grinding and Polishing M300 Steel with Elastic Abrasives**
Xin Tong(Xi'an University of Architecture and Technology),
Xiaojun Wu(Xi'an University of Architecture and Technology),
Xiao Shu(Xi'an University of Architecture and Technology),
Hao Sun(Xi'an University of Architecture and Technology)
- 14:00-14:20 **OP006** 167 **Development of SiC Polishing Technology by Using Plasma**
Yong Sup CHOI(National Fusion Research Institute),
Kang- Il Lee(National Fusion Research Institute),
Dong Chan Seok(National Fusion Research Institute),
Soo Ouk Jang(National Fusion Research Institute)
- 14:20-14:40 **OP007** 174 **Analysis of Deformation Through Densification of Additively Manufactured Parts in Selective Laser Sintering**
Sangho Ha(Ulsan National Institute of Science and Technology),
Namhun Kim(Ulsan National Institute of Science and Technology),
Eunju Park(Ulsan National Institute of Science and Technology)
- 14:40-15:00 **OP008** 179 **Additive Manufacturing of Microoptical Devices Using the Optical Pickup Head Configuration**
Hsi-Fu Shih(National Chung Hsing University),
Jia-Jin Cai(National Chung Hsing University)

MIRAI Annual Session 2**Room 2 (108)**

- 13:40-14:00 **A006** **Fabrication of Fresnel Lenses for Space Telescope to Observe Cosmic Rays**
Hiroshi Kasuga(RIKEN)
- 14:00-14:20 **A007** **Study on Refresh of used Cerium Oxide Polishing Powder by Laser Irradiation**
Teruko Kato(RIKEN)
- 14:20-14:40 **A008** **Laser Technology for Data-driven Material Fabrications**
Satoshi Wada(RIKEN)
- 14:40-15:00 **A009** **Composite Manufacturing Technology for Superhard Mold Microstructure Combined with Grinding, Discharge Machining and Femtosecond Laser Machining**
Shaohui Yin(Hunan University)

Organized Session**Room 3 (206)***Precision Machinery and Related Materials***Session Chair: Sungki Lyu**(Gyeongsang National University)

- 13:10-13:40 **Keynote Speech 2** **Nano-particles in Fluid: The Application of Liquid Electrode for Energy Storage**
Heesung Park(Changwon National University)
- 13:40-14:00 **OP019** 062 **A Study on the Evaluation of Thermal Effect in Induction-Assisted Machining**
Eunjung Kim(Changwon National University),
Choonman Lee(Changwon National University)
- 14:00-14:20 **OP020** 063 **Experimental Investigation of Tool Life in Thermally Assisted Machining Using Single and Multi-heat Sources**
Wan-Sik Woo(Changwon National University),
Choon-Man Lee(Changwon National University)
- 14:20-14:40 **OP021** 090 **A Basic Study on the Titanium Wire Laser Additive Manufacturing According to Feeding Speed**
Won-jung Oh(Changwon National University),
Choon-man Lee(Changwon National University)

New and Renewable Energy

Room 4 (207)

Session Chair: Suk Won Cha(Seoul National University)

- 13:10-13:40 **Keynote Speech 3** **Defect Engineering of Kesterite Thin-Film Solar Cells Towards Scalable and Low-Cost Manufacturing**
 Yun Seog Lee(Seoul National University)
- 13:40-14:00 **OP033** 209 **Modal Response with the Debonding Damage at Spar-cap and Trailing-edge of 5MW-class Composite Blade**
 Hak-Geun Kim(Kunsan National University),
 Ki-Weon Kang(Kunsan National University),
 Yun-Jung Jang(Kunsan National University)
- 14:00-14:20 **OP034** 312 **Effective Harvest of Biomechanical Energy Through a Mechanically Designed System of TENG**
 Jaewon Yoo(Pohang University of Science and Technology),
 Dong Sung Kim(Pohang University of Science and Technology),
 Dongwhi Choi(Pohang University of Science and Technology)
- 14:20-14:40 **OP035** 065 **Enhancement of Electric Power from New Liquid Media-based TEG Device**
 Hakjae Lee(The University of Tokyo),
 Dai Kobayasi(The University of Tokyo),
 Nobuyuki Takama(The University of Tokyo),
 Beomjoon Kim(The University of Tokyo)

Organized Session**Room 5 (102)****Additive Manufacturing – State of the Art 2****Session Chair: In Hwan Lee**(Chungbuk National University)

- 13:40-14:00 **OP043** 205 **Implication of New Nozzle Designs via Additive Manufacturing on Minimum Quantity Lubrication Machining Process**
 Patrick Kwon(Michigan State University),
 Tyler Bauder(Michigan State University),
 Hawke Suen(Michigan State University),
 Dihn Nguyen(Michigan State University),
 Sivajyothi Vemulapalli(Michigan State University),
 Dave Stepheson(Ford Motor Compacy),
 Junghoon Yeom(Michigan State University),
 Yang Guo(Michigan State University),
 Juan Sandoval(Michigan State University),
 Shubhankar Gandhi(Michigan State University)
- 14:00-14:20 **OP044** 226 **Thermo-mechanical Analysis of Corner Deposition of a Ti-6Al-4V Wire Feeding Type DED Process**
 Dong Gyu Ahn(Chosun University),
 Bih-Lii Chua(Chosun University),
 Ho-Jin Lee(Chosun University)
- 14:20-14:40 **OP045** 236 **Femtosecond Laser Direct Writing of Flexible/Stretchable Ultra-thin Diffractive Micro-optics**
 Young-Jin KIM(Nanyang Technological University)
- 14:40-15:00 **OP046** 416 **Novel Design of the Layer Manufacturing with Spindle-driven Dispensing System in Laser Melting of Polymeric-metallic Colloids on Heterogeneous Workpiece Materials**
 Chunliang Kuo(National Taiwan University of Science and Technology),
 Tsunghsieh Yeh(National Taiwan University of Science and Technology),
 Anchun Chiang(National Taiwan University of Science and Technology)
- 16:10-17:50 **International Cooperation of Additive Manufacturing**

Precision Manufacturing Processes 3

Room 1 (107)

Session Chair: Bo Hyun Kim(Soongsil University)

- 16:10-16:30 **OP009** 211 **The Fabrication of Glycerol-Based Biodegradable Polymeric Scaffolds for Liver Regeneration via Additive Manufacturing**
 Jane Wang(National Tsing Hua University),
 Chia-Lin Teng(National Tsing Hua University),
 Syuan-Ku Hsiao(National Tsing Hua University),
 Wai-Sam Ao-leong(National Tsing Hua University),
 Yi-Kong Hsieh(National Tsing Hua University)
- 16:30-16:50 **OP010** 219 **Research on the Protrusion Problem in the Bonding Process of Free-standing SU-8 Microstructure**
 Zebing Mao(Tokyo Institute of Technology),
 Joon-wan KIM(Tokyo Institute of Technology),
 Kazuhiro Yoshida(Tokyo Institute of Technology)
- 16:50-17:10 **OP011** 228 **Direct Laser Assisted Machining of CFRP Through a Sapphire Tool**
 Simon Park(University of Calgary),
 Yuan Wei(University of Calgary),
 Chaneel Park(University of Calgary),
 Yanyan Chang(Harbin Engineering University),
 Xiaoliang Jin(University of British Columbia)
- 17:10-17:30 **OP012** 247 **Relationship Between Groove Density and Lapping Characteristics from the Viewpoint of Contact Interface Conditions**
 Taekyung Lee(Korea Institute of Industrial Technology),
 Hyoungjae Kim(Korea Institute of Industrial Technology),
 Sangjik Lee(Korea Institute of Industrial Technology),
 Doyeon Kim(Korea Institute of Industrial Technology),
 Haedo Jeong(Pusan National University)
- 17:30-17:50 **OP013** 277 **Application of Electrically-assisted Treatment in Advanced High Strength Steels**
 Hye-Jin Jeong(Seoul National University),
 Heung Nam Han(Seoul National University),
 Ju-Won Park(Seoul National University),
 Kyeong Jae Jeong(Seoul National University),
 Nong Moon Hwang(Seoul National University),
 Sung-Tae Hong(University of Ulsan)

MIRAI Annual Session 3**Room 2 (108)**

- 16:10-16:30 **A010** **Fast Switchable Laser for Photoacoustic Imaging**
Masayuki Maruyama(RIKEN)
- 16:30-16:50 **A011** **Precise Spatial Laser Measurement of Surface of Remote Object**
Norihito Saito(RIKEN)
- 16:50-17:50 **Annual Meeting**

Materials 2

Room 3 (206)

Session Chair: Je Hoon Oh(Hanyang University)

- 16:10-16:30 **OP022** 325 **Computational Study of Mechanical Properties of Carbon Based Coatings**
Kuk-Jin Seo(Yonsei University),
Dae-Eun Kim(Yonsei University),
Oleksiy Penkov(Yonsei University)
- 16:30-16:50 **OP023** 344 **Advanced Capability of BMP2-loaded Mesoporous Calcium Silicate Bioscaffolds of Osteogenesis in Tissue Engineering**
Ming-You Shie(China Medical University),
Yiwen Chen(China Medical University),
Yen-Hong Lin(China Medical University)
- 16:50-17:10 **OP024** 356 **Raman Measurements of Magnons in Hexagonal RMnO₃ (R=Y, Rare Earths)**
In-Sang Yang(Ewha Womans University)
- 17:10-17:30 **OP025** 397 **Modeling and Analyses of the 2-dimensional Closed Cell Aluminum Foams Using Central Voronoi Tessellation and MultiJet Printing Technology**
Jungsub Lee(Korea University),
Byoung-Ho Choi(Korea University),
Sang-Youn Park(Korea University)
- 17:30-17:50 **OP026** 458 **Superhydrophobic PTFE Surface Preparation by Plastic Deformation and Their Application for Oil-Water Separation**
In Yong Moon(Korea Institute of Materials Science),
Seong-Hoon Kang(Korea Institute of Materials Science),
Ho Won Lee(Korea Institute of Materials Science),
Young-Seok Oh(Korea Institute of Materials Science)
- 17:50-18:10 **OP027** 040 **Mathematical Modeling of Time-dependent Material Behavior with Direct Time Discretization of Volterra Integral Equation**
Shinhoe Kim(Korea Advanced Institute of Science and Technology),
Yong-Taek Im(Korea Advanced Institute of Science and Technology)
- 18:10-18:30 **OP028** 255 **Wet-Impregnation Method for Phase Change Composites of Octadecane in Porous Silica Gels**
Tien Giang Nguyen(Korea University of Science and Technology),
In Park(Korea University of Science and Technology),
Ha Soo Hwang(Korea Institute of Industrial Technology),
Jeasung Park(Korea Institute of Industrial Technology)

Sustainable Technology**Room 4 (207)****Session Chair: Tsai Chi Kuo**(Chung Yuan Christian University)

- 16:10-16:30 **OP036** 068 **Part Loading on Pallets and Scheduling for a Flexible Machining System with Multi-fixturing Pallets**
 Jeong-Hoon Shin(Hanyang University),
 Dong-Ho Lee(Hanyang University),
 Dong-Kyu Lee(Hanyang University),
 Hyoung-Ho Doh(Hanyang University)
- 16:30-16:50 **OP037** 173 **Assessment Method for Sustainable Factories of the Future**
 Jahau Lewis Chen(National Cheng Kung University),
 Hong-Hsiang Chen(National Cheng Kung University)
- 16:50-17:10 **OP038** 389 **R&D Challenges to Promote Product Remanufacturing**
 Mitsutaka Matsumoto(National Institute of Advanced Industrial Science and Technology), Yasunari Matsuno(Chiba University),
 Masao Hayakawa(National Institute for Materials Science),
 Kenichi Nakajima(National Institute for Environmental Studies),
 Hideyuki Murakami(National Institute for Materials Science),
 Shingo Hirose(National Institute of Advanced Industrial Science and Technology)

July 5 (Thursday)

Precision Manufacturing Processes 4

Room 1 (107)

Session Chair: Simon Park(University of Calgary)

- 09:20-09:40 **OP047** 303 **Friction Stir Spot Welding of Dissimilar Ultra High Strength Steels**
 Mounarik Mondal(University of Ulsan),
 Sung-Tae Hong(University of Ulsan),
 Hrishikesh Das(University of Ulsan),
 Kawng-Jin Lee(Korea Institute of Industrial Technology),
 Kyu Yeol Park(University of Ulsan)
- 09:40-10:00 **OP048** 335 **The Effects of Ultrasonic Nanocrystal Surface Modification Technique Temperature on the Mechanical Properties, Wear and Corrosion Resistances of Inconel 718 at High Temperatures**
 Auezhan Amanov(Sunmoon University)
- 10:00-10:20 **OP049** 363 **Ejection Characteristics of Highly Viscous Fluids Using Magnetostrictive DoD Inkjet Printhead**
 Young-Woo Park(Chungnam National University),
 Myounggyu Noh(Chungnam National University)
- 10:20-10:40 **OP050** 364 **Roll-to-roll Gravure Etching Processed Source-drain Electrode Layer for Organic Thin Film Transistor**
 Jaemin Kim(Konkuk University),
 Sunglim Ko(Konkuk University)
- 10:40-11:00 **OP051** 367 **Fabrication of Wafer-level Mold for Nanoimprint Lithography Using STAMP Program and Self-alignment Etching Process**
 Sung-Won Youn(National Institute of Advanced Industrial Science and Technology),
 Kenta Suzuki(National Institute of Advanced Industrial Science and Technology),
 Hiroshi Hiroshima(National Institute of Advanced Industrial Science and Technology)
- 11:20-11:50 **Keynote Speech 4** **Development of the Water Machining System (the Electric Rust Preventive Machining System) – Clean Ultra Precision Machining with Using Water Machine Tool System for Sustainable Manufacturing –**
 Naohiro Nishikawa(Iwate University/Zhejiang University of Technology),
 Julong Yuan(Zhejiang University of Technology),
 Wei Hang(Zhejiang University of Technology),
 Chengwu Wang(Zhejiang Normal University)

Design and Products 1**Room 2 (108)****Session Chair: Won Seok Chang**(Korea Institute of Machinery and Materials)

- 09:40-10:00 **OP057** 092 **Design of a Broadband IR Microscope Objective**
 Youngsik Kim(University of Arizona),
 Weichuan Gao(University of Arizona)
- 10:00-10:20 **OP058** 169 **A Mesh and Boundary Representation (B-rep) Combined Approach for Lightweight Data Format Development in Collaborative CAD**
 Cong Hong Phong Nguyen(Chung-Ang University),
 Young Choi(Chung-Ang University),
 Youngdoo Kim(Chung-Ang University)
- 10:20-10:40 **OP059** 170 **Effect of Force and Stability Analysis for Gantry Robot Used with Abrasive Water Jet**
 Vimalesh Annadurai(Pusan National University),
 Jung Hwan Ahn(Pusan National University)
- 10:40-11:00 **OP060** 305 **The Effect of Surface Morphology and Material Property on the Maturation of Cardiomyocytes**
 Jong Yun Kim(Chonnam National University),
 Dong-Weon Lee(Chonnam National University)
- 11:20-11:50 **Keynote Speech 5** **Development of High Precision Large Optical Systems**
 Myung Kyu Cho(National Optical Astronomy Observatory)

Organized Session**Room 3 (206)****Soft Robotics****Session Chair: Won-Shik Chu**(Gyeongsang National University)

- 10:00-10:20 **OP066** 340 **High-Speed, Largely deformable Shape Memory Alloy (SMA) Based Microactuators**
 Hyun-Taek Lee(Seoul National University),
 Sung-Hoon Ahn(Seoul National University),
 Min-Soo Kim(Seoul National University),
 Gil-Yong Lee(Kumoh National Institute of Technology)
- 10:20-10:40 **OP067** 399 **Shape Memory Alloy-based Textile Actuators and Applications**
 Min-Woo Han(Harvard University),
 Sung-Hoon Ahn(Seoul National University),
 Woo-Kyun Jung(Seoul National University),
 Jeehyun Kil(Hongik University),
 Soo-Min Lee(Seoul National University),
 Yun-Ja Nam(Seoul National University)
- 10:40-11:00 **OP068** 121 **3D-printed Polymer-paper Based Soft Tendril-inspired Grippers**
 Wei Wang(Seoul National University),
 Sung-Hoon Ahn(Seoul National University),
 Yingjun Quan(Seoul National University),
 Hyung-Bin Park(Seoul National University),
 Dong-Ryul Kim(Seoul National University)
- 11:20-11:50 **Keynote Speech 6** **Geometric Error Measurement in an Ultra-precision 5-axis Machine Tool Using On-machine Measurement System**
 Sangkee Min(University of Wisconsin-Madison),
 Sangjin Maeng(University of Wisconsin-Madison)

Precision Engineering 2**Room 4 (207)****Session Chair: Kyung-Hee Park**(Korea Institute of Industrial Technology)

- 09:40-10:00 **OP073** 177 **Dynamic Analysis of a Swing Mechanism in a Multi-wire Saw Machine Tool**
Seojun Hong(Kookmin University),
Jay-Il Jeong(Kookmin University),
YEONGGEUL PARK(Kookmin University)
- 10:00-10:20 **OP074** 248 **Prediction of Processing Time of CNC Machining Center Using Artificial Neural Network**
Chunhui Chung(National Taiwan University of Science and Technology),
Zheng-Hao Huang(National Taiwan University of Science and Technology)
- 10:20-10:40 **OP075** 253 **Drone Fleet for Nuclear Facility Monitoring and Radiation Detection**
Jongwon Park(Korea Atomic Energy Research Institute),
Inyong Kwon(Korea Atomic Energy Research Institute)
- 10:40-11:00 **OP076** 288 **Deadweight Control of Robot Manipulator for Surface Finishing Operations**
Sangki Park(Gwangju Institute of Science and Technology),
Sun-Kyu Lee(Gwangju Institute of Science and Technology),
Jong-Jae Kim(Gwangju Institute of Science and Technology)

Organized Session**Room 5 (102)***Nano Thin-film Synthetic Technology for Machining of CFRP***Session Chair: Hyunkyueon**(Kumoh National Institute of Technology)

- 10:00-10:20 **OP080** 295 **Development of Equipment and Vibration Analysis Method for Evaluating Adhesion of Nano-diamond Coated Tools**
 So Jin Lee(Kumoh National Institute of Technology),
 Hyun Kyu Kweon(Kumoh National Institute of Technology),
 Yong Min Kweon(Kumoh National Institute of Technology),
 Jing Hua Li(Kumoh National Institute of Technology),
 Dong Gil Ahn(TeaguTec)
- 10:20-10:40 **OP081** 332 **Cemented Carbide Tool for CFRP Machining(2)**
 Woo-Seok Kim(TeaguTec)
- 10:40-11:00 **OP082** 384 **Raman Spectroscopy for Tool Wear Analysis in Nano-crystalline Diamond Coated Cutting Tools**
 Kil-dong Sung(Daegu Mechatronics & Materials Institute),
 Sung-kyu Choi(Daegu Mechatronics & Materials Institute),
 Dong-gyu Kim(Daegu Mechatronics & Materials Institute),
 Ik-soo Kang(Daegu Mechatronics & Materials Institute),
 Yun-chul Jung(Daegu Mechatronics & Materials Institute)

Precision Manufacturing Processes 5

Room 1 (107)

Session Chair: Taeho Ha(Korea Institute of Machinery and Materials)

- 14:10-14:30 **OP052** 390 **Influence of Varying Electrode Diameter on Indentation Characteristic of Resistance Spot Welding**
Atanu Das(Chosun University),
Hee-Seon Bang(Chosun University),
Han-Sur Bang(Chosun University),
In Cheol Choi(Chosun University)
- 14:30-14:50 **OP053** 391 **Effect of Strain Rate and Friction on Formability According to Deformation Modes in Sheet Metal Forming**
Wanjin Chung(Seoul National University of Science and Technology),
Sungmin Cho(Seoul National University of Science and Technology),
Hyodong Kim(SK Magic Corporation),
Chundal Park(Daegu Mechatronics & Materials Institute)
- 14:50-15:10 **OP054** 498 **Fundamental Study on Control of Crack Propagation of SUS316 Plate by Laser Induced Patterns: Heat Treatment and Cladding**
Yeong-Kwan Jo(Pusan National University),
Sanghu Park(Pusan National University),
JaeHyun Yu(Pusan National University)
- 15:10-15:30 **OP055** 520 **A Novel Idea for Strengthening Resin Bonding to Zirconia with PECVD of Silicon Surface Treatment**
Huang-Jan Hsu(National Yang-Ming University),
Cho-Pei Jiang(National Formosa University),
Shyh-Yuan Lee(National Yang-Ming University)
- 15:30-15:50 **OP056** 323 **A Study on Laser-induced Fabrication of Multiscale Textured Silicon Pattern**
Seunghyun Back(Kumoh National Institute of Technology),
Bongchul Kang(Kumoh National Institute of Technology),
Seongbeom Kim(Kangwon National University),
Seung-Gab Kwon(Kumoh National Institute of Technology),
Liyana Hazwani Zamri(Kumoh National Institute of Technology)

Design and Products 2**Room 2 (108)****Session Chair: Gyu Man Kim**(Kyungpook National University)

- 14:10-14:30 **OP061** 366 **Design and Fabrication of Photothermally Driven Microscale Robot**
Min-Soo Kim(Seoul National University),
Sung-Hoon Ahn(Seoul National University),
Hyun-Taek Lee(Seoul National University),
Kang-In Lee(Seoul National University)
- 14:30-14:50 **OP062** 385 **Fastening Behavior of a Metal Screw for Plastic Joints**
Juhyun Nam(Hanyang University),
Je Hoon Oh(Hanyang University),
Hyung Soo Kim(Hyundai Motor Group)
- 14:50-15:10 **OP063** 386 **Design of Plastic Region Tightening Bolts for Automotive Applications**
Gyuyong Choi(Hanyang University),
Je Hoon Oh(Hanyang University),
Jaesoo Gwon(Hyundai Motor Group)
- 15:10-15:30 **OP064** 501 **Formation of Micropillars for Higher Performance of ECF Planar Micropumps**
Huy Hoang Huynh(Tokyo Institute of Technology),
Joon-wan KIM(Tokyo Institute of Technology),
Kazuhiro YOSHIDA(Tokyo Institute of Technology)
- 15:30-15:50 **OP065** 504 **Development of CAM System for Variable Pitch Screw Fabrication**
Yuta Nabeta(Chubu University),
Yoshimi Takeuchi(Chubu University),
Anthony Beaucamp(Kyoto University)

Research on Ultra-Precision Machining**Room 3 (206)***(The 2nd FANUC ROBONANO User Group Meeting)***Session Chair: Sangkee Min**(University of Wisconsin-Madison)

- 14:10-14:30 **OP069** 426 **Investigation of Process Parameters in Ductile-brittle Transition of Single Crystal Sapphire**
 Hae-Sung Yoon(Korea Aerospace University),
 Sangkee Min(University of Wisconsin-Madison),
 Suk Bum Kwon(University of Wisconsin-Madison),
 Aditya Nagaraj(University of Wisconsin-Madison),
 Seola Lee(University of Wisconsin-Madison)
- 14:30-14:50 **OP070** 449 **Micromachining Characteristics of the Polymer Based Materials**
 Hyung Wook Park(Ulsan National Institute of Science and Technology),
 Dong Min Kim(Ulsan National Institute of Science and Technology)
- 14:50-15:10 **OP071** 451 **Three-dimensional Micro Shape Creation on a Workpiece Located by Industrial Robot**
 Ren Kitakawa(Tokyo University of Agriculture and Technology),
 Keiichi Nakamoto(Tokyo University of Agriculture and Technology),
 Yoshimi Takeuchi(Chubu University)
- 15:10-15:30 **OP072** 529 **Influence of Servo Characteristics of Tool Spindle on Surface Quality in Ultra-precision Grinding of Optical Glass**
 Takumi Suetomi(Keio University),
 Yasuhiro Kakimura(Keio University),
 Masahiko Fukuta(Toshiba Machine Co., Ltd.),
 Katsutoshi Tanaka(Toshiba Machine Co., Ltd.)

Precision Engineering 3**Room 4 (207)****Session Chair: Masayuki Maruyama(RIKEN)**

- 14:10-14:30 **OP077** 336 **Dynamic Analysis of Double Plunger Type Solenoid Actuator for Ultra-high Pressure Hydrogen Storage Cylinder**
Jaeseong Choi(Pusan National University),
Hwayoung Kim(Pusan National University)
- 14:30-14:50 **OP078** 343 **Development of a Real-time Input Gear Fault Detection System for an Industrial Robot Based on Machine Learning Technique**
Jiwoong Lee(Sungkyunkwan University),
Sang Won Lee(Sungkyunkwan University),
Inwoong Noh(Sungkyunkwan University),
Sang Ik Jeong(Sungkyunkwan University),
Youngbin Kang(Sungkyunkwan University)
- 14:50-15:10 **OP079** 453 **Towards Smart Manufacturing: Enhancing Accuracy and Visualization by Multi Sensor Fusion**
Martin Jun(Purdue University),
Huitaek Yun(Purdue University),
Hanjun Kim(Purdue University)

Organized Session**Room 5 (102)***Innovative Forming***Session Chair: Tae-Wan Ku**(Pusan National University)

- 14:10-14:30 **OP083** 489 **Inter-ply Shear Resistivity Analysis and Optimization for Fiber Reinforced Composite Sheet Under Stretch-bend Forming**
 Abera Tullu(Pusan National University),
 Beom-Soo Kang(Pusan National University),
 Endale Bedada(Pusan National University),
 TaeWan Ku(Pusan National University)
- 14:30-14:50 **OP084** 131 **Improvement of Formability by Robust Temperature Control in Hot Forming Quenching Process of AA6061**
 Jaehong Kim(Pusan National University),
 Byung-Min Kim(Pusan National University),
 Dae-Cheol Ko(Pusan National University)
- 14:50-15:10 **OP085** 155 **Development of Predictive Model for Longitudinal Curvature Obtained by Flexibly Reconfigurable Roll Forming Apparatus Using Response Surface Methodology**
 Jiwoo Park(Pusan National University),
 Beomsoo Kang(Pusan National University),
 Mingyu Kil(Pusan National University),
 Junseok Yoon(Pusan National University),
 Jeong Kim(Pusan National University),
 Woojin Song(Pusan National University)
- 15:10-15:30 **OP086** 192 **Acquisition of Forming Limit Diagram of Al 6061-T6 and Formability Evaluation in Electrohydraulic Forming Process**
 MINA WOO(Pusan National University),
 JEONG KIM(Pusan National University),
 YONGHEE KIM(Pusan National University),
 HYEONGGYU PARK(Pusan National University),
 HONGKYO KIM(Pusan National University)
- 15:30-15:50 **OP087** 368 **Process Optimization for the New Punch Arrangement of Multi-point Dieless Forming Based on Local Bending Effect**
 Misganaw Abebe Baye(Pusan National University),
 Beomsoo Kang(Pusan National University),
 Junseok Yoon(Pusan National University)

Rapid Oral Presentation

▶ **July 5** (Thursday)

Rapid Oral Presentation 1

Room 1 (107)

Session Chairs: Doo-Man Chun(University of Ulsan),
Donghun Lee(Soongsil University)

- 13:10-13:15 **OP088** 053 **Evaluating the Transcription Effects of the Pressing Die on Glass Molding**
A-Cheng Wang(Chien Hsin University of Science and Technology),
Kuan-Yu Chen(Chung Yuan Christian University),
Chien-Yao Huang(National Applied Research Laboratories)
- 13:15-13:20 **OP089** 011 **Application of Q-type Aspheric Surface in the Design of 3D Printed Lens**
Cheng-Fang Ho(National Applied Research Laboratories),
Chien-Yao Huang(National Applied Research Laboratories),
Ping-Hung Lin(National Applied Research Laboratories),
Jun-Cheng Chen(National Applied Research Laboratories)
- 13:20-13:25 **OP090** 014 **Development of a Mirascope with 3D Printing Techniques**
Chien-Yao Huang(National Applied Research Laboratories),
Cheng-Fang Ho(National Applied Research Laboratories),
Hui-Jean Kuo(National Applied Research Laboratories),
Jun-Cheng Chen(National Applied Research Laboratories),
Ping-Hung Lin(National Applied Research Laboratories),
Hung-Pin Chen(National Applied Research Laboratories),
A-Cheng Wang(Chien Hsin University of Science and Technology)
- 13:25-13:30 **OP091** 313 **Experimental Study on Surface Quality, Subsurface Crack and Wire Wear During Multi-Wire Sawing of C- plane Sapphire Wafer**
Ajay Gupta(National Taiwan University of Science and Technology),
Chao-Chang A. Chen(National Taiwan University of Science and Technology)
- 13:30-13:35 **OP092** 521 **Biofabrication of Hybrid Scaffold Using Thermal Extrusion and Light Cured Three Dimensional Printing and Its In-Vitro Study of Biocompatibility**
Shih-Yu Kao(National Formosa University),
Cho-Pei Jiang(National Formosa University),
Yu-Da Yang(National Formosa University)
- 13:35-13:40 **OP093** 403 **Maximize the Efficiency of Cooling Channels Made by 3D Printing Technology for Injection Molding**
Xuan-Phuong Dang(Nha Trang University),
Hong-Seok Park(University of Ulsan)

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- 13:40-13:45 **OP094** 459 **Study on the Use of Dissolvable Microneedles in the Treatment of Stomatitis**
Kaifeng Luo(The University of Tokyo),
Beomjoon KIM(The University of Tokyo),
Yutaka Maruoka(National Center for Global Health and Medicine),
Rie Kinoshita(The University of Tokyo),
Teru Okitsu(The University of Tokyo),
Libo Wu(The University of Tokyo),
Nobuyuki TAKAMA(The University of Tokyo)
- 13:45-13:50 **OP095** 160 **Superhydrophobic Surface Preparation on Aluminum Alloy and Anti-frosting Performance**
Wei Xiao Du(China Academy of Machinery Science & Technology),
Li Zhan(China Academy of Machinery Science & Technology),
Zhongde Shan(China Academy of Machinery Science & Technology),
Guojie Liu(China Academy of Machinery Science & Technology)
- 13:50-13:55 **OP096** 301 **Fabrication and Properties of Nanoporous ZnO Thin Films for Ultraviolet Photodetectors**
Wen-Jen Lee(National Pingtung University),
Sheng-En Huang(National Pingtung University),
Chun-Rong Lin(National Pingtung University),
Hui-Chia Yang(Kun Shan University)

Rapid Oral Presentation 2

Room 1 (107)

Session Chairs: **Hyeong-Joon Ahn**(Soongsil University),
Baeksuk Chu(Kumoh National Institute of Technology)

- 16:20-16:25 **OP097** 460 **Application of Thermally Cross-linkable Pd/Polymer Composite Ink in Nylon Metal Surface Metallization**
 Min-Zhe Wu(National Defense University),
 Chang-Pin Chang(National Defense University),
 Ming-Der Ger(National Defense University)
- 16:25-16:30 **OP098** 058 **Preparation of Platinum-Hydroxyapatite Fibers for Direct Ethanol Fuel Cell Application**
 Titapa Tanawansombat(Chulalongkorn University),
 Rojana Pornprasertsuk(Chulalongkorn University),
 Dujreutai Pongkao Kashima(Chulalongkorn University)
- 16:30-16:35 **OP099** 461 **Effect of Power Supply on Corrosion Behaviour of Micro-Arc Oxidation Films on AZ31 Magnesium Alloy**
 Tsun Kuei Fu(Nation Defense University),
 Ming-Der Ger(Nation Defense University),
 Shun-Yi Jian(Nation Defense University)
- 16:35-16:40 **OP100** 172 **Design and Fabrication of Flexible Dye-sensitized Solar Cells with Composite Electrodes by Inkjet Printing**
 Chung Hao Chen(National Kaohsiung University of Science and Technology),
 Chin Tai Chen(National Kaohsiung University of Science and Technology)
- 16:40-16:45 **OP101** 380 **Design and 3D Printing of Microfluidic Channels for Glucose Sensing and Biofuel Cell Applications**
 Jun-Xiang Xu(National Kaohsiung University of Science and Technology),
 Chin-Tai Chen(National Kaohsiung University of Science and Technology)
- 16:45-16:50 **OP102** 523 **Study on the Application of Nitrogen-doped Holey Graphene/activated Carbon in Supercapacitor**
 Kuan-min Wu(Yuan Ze University),
 Nen-Wen Pu(Yuan Ze University),
 Jun-Bin Huang(National Chung Shan Institute of Science and Technology)
- 16:50-16:55 **OP103** 203 **Investigating the Influential Factors and the Triple Bottom Line Output**
 Tsai Chi Kuo(Chung Yuan Christian University),
 Yohanes Ari Tri Sambodo(Institute Teknologi Bandung)

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- 16:55-17:00 **OP104** 522 **Microwave Absorption Performance of Silicone Rubber Filled with carbon dioxide activated Holey Graphene**
Jheng-shian Yu(National Defense University),
Yih-Ming Liu(National Defense University),
Nen-Wen Pu(Yuan Ze University)
- 17:00-17:05 **OP105** 181 **Chatter Analysis and Stability Prediction of Milling Tool Based on Zero-order and Envelope Methods**
Chung-Cheng Chen(National Formosa University),
Wen-Yang Chang(National Formosa University),
Sheng-Jhih Wu(National Formosa University)