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PRESM 2018

International Symposium on
Precision **E**ngineering and
Sustainable **M**anufacturing

July 3 Tue – **July 7** Sat
2018

Sapporo
Convention Center
Sapporo, Japan



Organized by

 **KSPPE** Korean Society for
Precision Engineering

 **RIKEN**

**Program &
Proceedings**



PRESM 2018

International Symposium on
Precision **E**ngineering and
Sustainable **M**anufacturing

Program & Proceedings

Korean Society for Precision Engineering (KSPE, Korea)
RIKEN (Japan)

Pusan National University (PNU, Korea)
Engineering Research Center of Innovative Technology
on Advanced Forming (ERC/ITAF, Korea)

Seoul National University (SNU, Korea)
- IAMD
- ITEC

Korea Basic Science Institute (KBSI, Korea)

Korea Institute of Machinery and Materials (KIMM, Korea)

Korea Institute of Industrial Technology (KITECH, Korea)

Kumoh National Institute of Technology (Korea)

Changwon National University (CWNU, Korea)

- K-MEM R&D Cluster
- Creative HRD Center for Smart-Intell. Manuf. Systems



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Welcome to PRESM 2018

On behalf of the PRESM 2018 organizing committee, we would like to welcome all those attending the symposium.

The International Symposium on Precision Engineering and Sustainable Manufacturing (PRESM) is an international symposium that covers precision engineering and sustainable manufacturing. PRESM is intended to inherit and further advance the International Symposium on Green Manufacturing and Applications (ISGMA) initiated in 2011. Since its first symposium in 2011, ISGMA has served as a platform for academic and humane exchanges among outstanding researchers from every corner of the world in relation to sustainable manufacturing and its applications. Underpinned by ISGMA's reputation and excellence, PRESM is dedicated to ensuring the sustainable development of precision engineering and sustainable manufacturing and vitalizing international exchanges.

We would like to take this opportunity to express our gratitude to the organizing committee members and attendees for their contributions to ISGMA.

The organizing committee will spare no efforts to make sure this symposium will be an enjoyable gathering of passionate people. We hope all of you will come and join us.

We are looking forward to seeing you in Sapporo in July 2018 under the banner of PRESM. Thank you.

Chairs of PRESM 2018



**Prof.
Seong-Wook Hong**
Kumoh National Institute
of Technology (Korea)



**Dr.
Hitoshi Ohmori**
RIKEN, Chief Scientist (Japan)

Organizer



Korean Society for Precision Engineering (KSPE, Korea)



RIKEN (Japan)



Seoul National University (SNU, Korea)

- IAMD

- ITEC



Korea Institute of Industrial Technology (KITECH, Korea)



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- K-MEM R&D Cluster

- Creative HRD Center for Smart-Intell. Manuf. Systems



Kumoh National Institute of Technology (Korea)



Korea Basic Science Institute (KBSI, Korea)



Pusan National University (PNU, Korea) Engineering Research Center of Innovative Technology on Advanced Forming (ERC/ITAF, Korea)

Co-Organizer



Korea Railroad Research Institute (KRRI, Korea)



China Academy of Machinery Science and Technology(CAM, China)
State Key Lab. of Advanced Forming Technology & Equipment

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Hitoshi Ohmori	<i>RIKEN (Japan)</i>

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Di Zhang	<i>Shanghai Jiao Tong Univ. (China)</i>

Secretary General

Byeong Kwon Lee	<i>KSPE (Korea)</i>
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Plenary Speech 1

Future of High Value Manufacturing (Introduction of Bio-Medical Applications)

July 4 (Wed) 11:10-11:50



Tsunemoto Kuriyagawa

Graduate School of Biomedical Engineering, Tohoku University, Japan

E-mail: tkuri@m.tohoku.ac.jp

Session Chair : Daehie Hong(Korea University)

We aim to promote innovations of pico- & nano-precision Micro/Meso Mechanical Manufacturing (M4 process) at the frontier of manufacturing technology, including ultra-precision mechanical manufacturing technologies for various shapes, nano-precision fabrication for 3D microstructures, atom/molecule manipulation for nanostructures and so on. Our goal is not only to create high-precision shapes, but also to generate functional structures on the shape by controlling the micro textures. Today, I will introduce a unique technology, which is powder jet deposition (PJD). The deposition mechanism of PJD was studied with smoothed particle hydrodynamics (SPH) and molecule dynamics (MD) simulations. The deformation of a particle and a substrate by impact was successfully simulated. From the result, a thick film is generated due to the repetition of the deposition of the stagnation areas. The blasting experiments were also conducted to study the machining mechanism at transition condition. The machining surface was analyzed with SEM and TEM. It was that found from these results, the removal process of the substrate material and deposition process of particles onto the substrate occur concurrently under the transition conditions. Utilizing the PJD, a hydroxyapatite film has been successfully deposited on a human tooth as a new dental treatment.

Plenary Speech 2

Green and Appropriate Technologies in the 4th Industrial Revolution

July 4 (Wed) 15:20-16:00



Sung-Hoon Ahn

Department of Mechanical & Aerospace Engineering,
Seoul National University, Seoul, Korea
E-mail : ahnsh@snu.ac.kr

Session Chair : Beom Joon Kim(The University of Tokyo)

As the climate change and sustainable development have been more critical global issues, green technologies received great attention in manufacturing. While appropriate technology shares the same characteristics such as energy saving and reduction in environmental impact with green technology, 'affordability' is emphasized more in the appropriate technology which broadens its applications to developing countries as well as developed countries.

In the first part of this presentation, 'appropriate and green' technologies are introduced with reviews on emerging research areas in green technologies based on publication databases such as Web of Science and Journal Citation Report. As examples of appropriate green technologies in the era of the 4th Industrial Revolution, three topics are discussed: 1) additive manufacturing, 2) soft robotics and morphing structures/sensors, and 3) smart factory and smart grid.

For low cost additive processes, the Nano Particle Deposition System (NPDS) and Aerodynamically Focused Nano-particle (AFN) printing were applied for the fabrication of electrochromic window and high-sensitive strain sensors. The Soft Smart Composite (SSC) and shape memory knit actuator with low stiffness and stretchable features were developed and applied to various bio-mimic soft robotics. Scaling down to micro/nano level, photon-based actuation and sensing were introduced. Appropriate smart factory in Indonesia and smart grid testbed in Tanzania were implemented by utilizing energy monitoring systems to improve productivity.

In these numerous case studies, 'affordability' is emphasized as well as novelty of each technology.

Keynote Speech



Myung Kyu Cho **Principal Engineer, Opto-mechanics**
National Optical Astronomy Observatory, GSMT
program Office (NOAO-GSMTPO), USA

Title Development of Large High Precision Optical Systems



Yun Seog Lee **Professor**
Department of Mechanical Engineering
Seoul National University, Korea

Title Defect Engineering of Kesterite Thin-Film Solar Cells Towards Scalable and Low-Cost Manufacturing



Naohiro Nishikawa **Professor**
Faculty of Science and Engineering
Iwate University, Japan

Title 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-



Sangkee Min **Professor**
Mechanical Engineering
University of Wisconsin-Madison, USA

Title Geometric Error Measurement in an Ultra-precision 5-axis Machine Tool Using On-machine Measurement System



Heesung Park **Professor**
Mechanical Engineering Department,
Changwon National University, Korea

Title Nano-particles in Fluid: The Application of Liquid Electrode for Energy Storage



Chulho Yang **Program Coordinator and Professor**
Mechanical Engineering Technology
Oklahoma State University, USA

Title Development of Unique Auxetic Structures for Improved Performance in Shock Absorption and Dissipation

Program at a Glance

Sapporo Convention Center, Sapporo

July 3 (Tue)

15:00-17:30 Registration Open 1F, Lobby, Sapporo Convention Center

18:00-20:00 Welcome Dinner(only Invitee & Committee) ANA Crowne Plaza(Hotel), Sapporo

July 4 (Wed)

Date/time Room	Room #1-107	Room #2-108	Room #3-206	Room #4-207	Room #5-102
08:20	Registration Open - 1F, Lobby, Sapporo Convention Center				
09:00-10:40	Precision Manufacturing Processes 1	MIRAI Annual Session 1	Materials 1	Precision Engineering 1	Organized Session Additive Manufacturing -State of the Art 1
10:40-11:00	Coffee Break				
11:00-11:10	Opening Ceremony - Room#6 (Mid-sized Hall)				
11:10-11:50	Plenary Speech 1 Tsunemoto Kuriyagawa (Tohoku University, Japan) Room 6 (Mid-sized Hall)				
11:50-13:10	Conference Lunch - Room #101, Sapporo Convention Center				
13:10-13:40	Keynote Speech 1 Chulho Yang		Keynote Speech 2 Heesung Park	Keynote Speech 3 Yun Seog Lee	
13:40-15:00	Precision Manufacturing Processes 2	MIRAI Annual Session 2	Organized Session Precision Machinery and Related Materials	New and Renewable Energy	Organized Session Additive Manufacturing -State of the Art 2
15:00-15:20	Coffee Break				
15:20-16:00	Plenary Speech 2 Sung-Hoon Ahn (Seoul National University, Korea) Room 6 (Mid-sized Hall)				
16:00-16:10	Break				
16:10-17:50	Precision Manufacturing Processes 3	MIRAI Annual Session 3	Materials 2	Sustainable Technology	Organized Session Additive Manufacturing -State of the Art : Forum

July 5 (Thu)

Date/time Room	Room #1-107	Room #2-108	Room #3-206	Room #4-207	Room #5-103
08:50	Registration Open				
09:30-11:00	Precision Manufacturing Processes 4	Design and Products 1	Organized Session Soft Robotics	Precision Engineering 2	Organized Session Nano Thin-film Synthetic Technology for Machining of CFRP
11:00-11:20	Coffee Break				
11:20-11:50	Keynote Speech 4 Naohiro Nishikawa	Keynote Speech 5 Myung Kyu Cho	Keynote Speech 6 Sangkee Min		
11:50-13:00	Conference Lunch - Room #101, Sapporo Convention Center				
13:00-14:00	Poster Presentation 1 - Room#6 (Mid-sized Hall) Rapid Oral Presentation 1 - Room#1 (107)				
14:00-14:10	Break				
14:10-15:50	Precision Manufacturing Processes 5	Design and Products 2	Organized Session Research on Ultra-Precision Machining (The 2nd FANUC ROBONANO User Group Meeting)	Precision Engineering 3	Organized Session Innovative Forming
15:50-16:10	Coffee Break				
16:10-17:10	Poster Presentation 2 - Room#6 (Mid-sized Hall) Rapid Oral Presentation 2 - Room#1 (107)				
17:10-17:40	Closing Ceremony (Awards, PRESM 2019 Announcements and Closing Remark by Conference Chair)				
18:00-20:00	Banquet - Sapporo Beer Museum (Downtown in Sapporo, Regular Participants and Banquet Ticket Owners Only)				

▶ **July 6** (Fri)

10:00	Technical Tour	1F, Lobby, Sapporo Convention Center
15:00		Hokkaido University Museum & Former Hokkaido Government Office etc.

* For Participants who register in advance

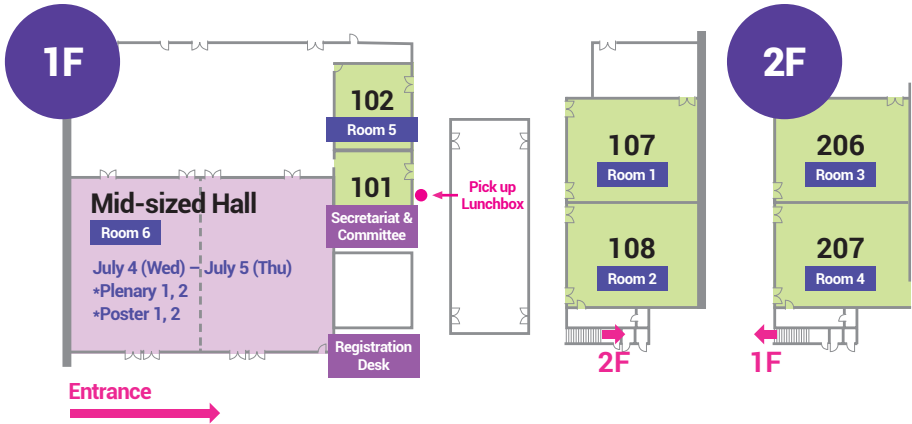
▶ **July 7** (Sat)

Local Tour	Individual
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Venue

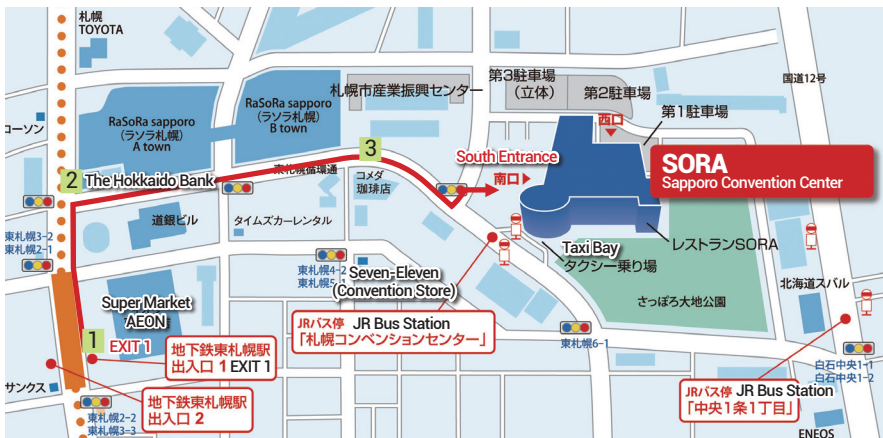
Sapporo Convention Center

- 1 Free Wi-Fi ; Sapporo_City_Wi-Fi.
- 2 Registration Desk – 1F, in front of Mid-sized Hall



Higashi Sapporo Station

- 1 Exit 1 Turn Right
- 2 Turn Right ; Hokkaido Bank
- 3 About 8 min. walk from Higashi-Sapporo Subway Stn.



Conference Information

Registration

Registration desk will be located at the 1st floor.

Category	Early Registration	On-Site Registration
Date	By May 31, 2018	from June 1, 2018
Regular	700USD / 750,000KRW	800USD / 850,000KRW
Student	350USD / 400,000KRW	400USD / 450,000KRW
Banquet	70USD / 70,000KRW	

- 1 Please check your registration with the participants name at the Registration Desk.
- 2 The registered participants can receive the name tag, program book, e-proceedings (USB), Lunch coupon
- 3 Banquet coupon is provided to Regular participants and to the person who purchased the banquet coupon
- 4 On-site registration is available ONLY Cash(USD, KRW) and ONLY participants.
; Presenter should complete the Early-Registration.

Meetings

Meetings	Date	Time	Place
Welcome Dinner	July 3 (Tue)	18:30-18:00	24F, Banquet Hall HAKUYO, ANA Crowne Plaza(Hotel), Sapporo
MIRAI Annual Meeting	July 4 (Wed)	09:00-18:00	Sapporo Convention Center Room #2 (108)
IJPEM/IJPEM-GT Editorial Board Meeting	July 4 (wed)	12:00-13:00	Sapporo Convention Center Room #1 (107)
The 2nd FANUC ROBONANO User Group Meeting	July 5 (Thu)	14:00 -18:00	Sapporo Convention Center Room #3 (206)

Award

Best Paper Awards and Young Researcher Awards will be presented after poster session2 at Mid-sized Hall

Lunch

Time	Place
July 4 (Wed) 11:50-13:10	Lobby, #108, #206, #207 and Mid-sized Hall
July 5 (Thu) 11:50-13:10	

Will be served with Lunch box at **Room #101** and any place within Lobby, #108, #206, #207 and Mid-sized Hall

Banquet

Time	Place
July 5 (Thursday) 18:00 ~ 20:00	<ul style="list-style-type: none"> ▪ Poplar-kan(2F) Sapporo Beer Garden (Downtown in Sapporo) ▪ Please submit the coupon for Banquet to staff when you enter the Banquet Hall

Technical Tour

Place	Programs
Technical Tour of PRESM 2018 will be composed of visit to The Hokkaido University Museum and Downtown of Sapporo.	09:30 Departure
	09:50 Hokkaido University Museum
	12:00 Lunch
	13:00 Sapporo Historical Tour
	15:00 Drop by Sapporo Station and goes to New Chitose Airport

Presentation Guideline

Oral

- Presentation time: 20 mins / Presentation: 15 mins, Q&A 5 mins
- 1st timer alert: 2 mins remaining (13 mins after start)
- 2nd timer alert: 15 mins after start (end of time)
- Presentation materials: Please bring your PPT material on a USB memory stick.
; no specific format required
- Please upload your presentation material on the computer in the conference room by 10 mins before the session.
- Please wear your name tag and follow the instructions of the session chair.
- You can ask for help from our staff in blue vest.

Rapid Oral Presentation

Description

- Rapid Oral Presentations will be scheduled during the Poster Sessions (on July 5).
- The presentations will be made on a special stage in Room 1(#107) of the Sapporo Convention Center.

How to 3-minutes Rapid Oral Presentation

- 1 The presentation time for each speaker is 3 minutes and there will not be any Q&A time.
- 2 Please bring your presentation file(PPT format, Less than 5 Slide) in your USB memory, and upload your file in the lap-top computer at the session room at least 10 mins before.
- 3 You do NOT need to prepare the printed poster.

Rapid Oral Presentaton 1 13:00-14:00

Rapid Oral Presentaton 2 16:10-17:10

Poster

Poster size: A0 (841mmX1189mm)

; All Presenters should print and bring their posters to the PRESM2018.

Poster presentation time: 5 mins (presentation: 3 mins, Q&A: 2 mins)

; You can see the paper No., title, and presenter info on the top of the poster board.

Please wear your name tag and answer questions of judges in front of the board.

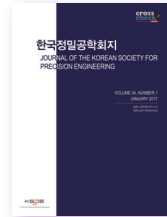
Poster Affixation & Presentation time :

Category	Poster Mounting & Presentation Time	Date & Location
Poster 1	Affixation time 11:00-13:00 Presentation time 13:00-14:00	July 5 (Thursday) Mid-size Hall
Poster 2	Affixation time 14:30-16:10 Presentation time 16:10-17:10	

Journal Publication

Selected paper will be published in journals below after review.

- International Journal of Precision Engineering and Manufacturing (SCIE, IF 1.497)
- International Journal of Precision Engineering and Manufacturing-Green Technology (SCIE, IF 3.494)
- Journal of the Korean Society for Precision Engineering (SCOPUS)



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
- 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**
Norihiro 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: Hyunkyuu Kweon(Kumoh National Institute of Technology)

- | | | | |
|-------------|--------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10:00-10:20 | OP080 | 295 | <p>Development of Equipment and Vibration Analysis Method for Evaluating Adhesion of Nano-diamond Coated Tools</p> <p>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)</p> |
| 10:20-10:40 | OP081 | 332 | <p>Cemented Carbide Tool for CFRP Machining(2)</p> <p>Woo-Seok Kim(TeaguTec)</p> |
| 10:40-11:00 | OP082 | 384 | <p>Raman Spectroscopy for Tool Wear Analysis in Nano-crystalline Diamond Coated Cutting Tools</p> <p>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)</p> |

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)

Poster Presentation 1

July 5 (Thursday), 13:00-14:00

Precision Manufacturing Processes 1

Room 6 (Mid-sized Hall)

Session Chairs: Jihong Hwang(Seoul National University of Science and Technology),
Hochan Kim(Andong National University)

- PP001** 012 **Material Removal Rate Model for CMP Considering the Deformation of Pad's Asperity**
Hyunseop Lee(Tongmyong University)
- PP002** 026 **Development of the Processing Technology for the LF5 Lens Hole Via the Spiral Grinding Process in a Five-axis High Speed Machine**
Soonkyu Je(Korea Basic Science Institute),
Geon-hee Kim(Korea Basic Science Institute),
In-ju Yeo(Korea Basic Science Institute)
- PP003** 027 **A Study on the Mgneto-rheological Fnishing Characteristic of Zerodur Freeform Optics for Focusing Laser**
Han GyoI Oh(Korea University of Science and Technology),
Geonhee Kim(Korea Basic Science Institute)
- PP004** 051 **Development of Microscope Based on Vacuum Ultraviolet Light for the Defect Inspection on the Large Size Freeform Optical Surfaces**
I Jong Kim(Korea Basic Science Institute),
Geon Hee Kim(Korea Basic Science Institute),
Seung-Hyun Kim(Korea Basic Science Institute),
Sangwon Hyun(Korea Basic Science Institute),
Soon Kyu Je(Korea Basic Science Institute)
- PP005** 052 **A Study on Process for Improving Mechanical Property of Special Casting Sand by Using the Binder Jetting Method**
HAE JEONG KIM(SENTROL Ltd.),
SUNG WOO BAE(SENTROL Ltd.)
- PP006** 056 **TIF Characterization for SiC Mirror with Various Impact Points of Wheel**
Jeong-Yeol Han(Korea Astronomy and Space Science Institute),
Jihun Kim(Korea Astronomy and Space Science Institute),
Yunjong Kim(Korea Astronomy and Space Science Institute),
Myung Cho(National Optical Astronomy Observatory),
Geun-Hee Kim(Korea Basic Science Institute),
Sangwon Hyun(Korea Basic Science Institute),
Minwoo Jeon(Korea Basic Science Institute),
Dohoon Kim(Korea University of Science and Technology)
- PP007** 070 **Fabrication of Ti-6Al-4V Thin Cylinder by DED Metal 3D Printing Process**
Taeho Ha(Korea Institute of Machinery and Materials),
Changwoo Lee(Korea Institute of Machinery and Materials),
Hyeonseop Shin(Korea Institute of Machinery and Materials),
Segon Heo(Korea Institute of Machinery and Materials)

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- PP008** 076 **Evaluation of Dissimilar Weldability for Aluminum Alloy 6061-T6 to Zn-coated Steel Using Delta-spot Welding Process**
Young Gon Kim(Korea Institute of Industrial Technology),
Dong Cheol Kim(Korea Institute of Industrial Technology),
Young Hyun Kim(Korea Institute of Industrial Technology),
Min Suk Oh(Korea Institute of Industrial Technology),
Sung Min Joo(Chosun University)
- PP009** 079 **Development of R2R Micro-gravure Coating Laminate System and Application of Battery Parts for Electric Vehicles**
MINSOOK YU(TOPnC CO., LTD.),
DONGSOO KIM(Hanbat National University),
JUNGMIN CHO(TOPnC CO., LTD.),
MUNYONG SONG(TOPnC CO., LTD.),
MINHA KIM(TOPnC CO., LTD.)
- PP010** 087 **Cone Type ECR Plasma Source for Ion Beam Figuring**
Soo Ouk Jang(National Fusion Research Institute),
Yong Sup Choi(National Fusion Research Institute),
Kang Il Lee(National Fusion Research Institute)
- PP011** 091 **Studies on Thin Plate Welding with In-process Surface Cooling Using 3D-finite Element Analysis**
Dong-Kyu Lee(Sejong University),
Sung-Min Joo(Chosun University),
Jong-Won Park(Research Institute of Industrial Science & Technology),
Young-Gon Kim(Korea Institute of Industrial Technology)
- PP012** 095 **Investigation of Exfoliated Graphite Nanoplatelet (xGNP) on the Performance of Magnetic-field Assisted Finishing (MAF)**
Pil-Ho Lee(Sungkyunkwan University),
Haseung Chung(Michigan State University),
Hoa Nguyen(Michigan State University),
Patrick Kwon(Michigan State University)
- PP013** 099 **A Study on Ion Beam Characteristics of Developed Focused Ion Beam Using Ar Plasma**
Minyoung Park(Korea Electronics-Machinery Convergence Technology Institute),
Dongyoung Jang(Seoul National University of Science and Technology),
Manjin Park(Korea Electronics-Machinery Convergence Technology Institute),
Jonghan Won(Korea Electronics-Machinery Convergence Technology Institute)
- PP014** 109 **Synthesis of Benzoxazine-based Binder and Its Application to 3D Printing**
Bu Yoon Kang(Korea Institute of Industrial Technology),
Man Sig Lee(Korea Institute of Industrial Technology),
Jae Ho Baek(Korea Institute of Industrial Technology),
Dae-Won Park(Pusan National University)

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- PP015** 111 **Precision Measurement of Freeform Optical Surfaces for Figure Correction and Inspection**
Sangwon Hyun(Korea Basic Science Institute),
Geon-Hee Kim(Korea Basic Science Institute),
I-Jong Kim(Korea Basic Science Institute),
Min-Woo Jeon(Korea Basic Science Institute),
Soonkyu Je(Korea Basic Science Institute)
- PP016** 114 **The Effect of Heat Affected Zone in Nanosecond Pulsed Laser Scanning Ablation of Silver Nanoparticle Film**
Hee Lak Lee(Hanyang University),
Seung-Jae Moon(Hanyang University),
Yoon-Jae Moon(Korea Institute of Industrial Technology),
Jun Young Hwang(Korea Institute of Industrial Technology)
- PP017** 115 **Development of 3D Printing Simulation System for Web-based 3D Printing Service Platform**
Tae-geun Son(Korea Institute of Science and Technology),
Youngjun Kim(Korea Institute of Science and Technology),
Yong-soo Kim(Korea University of Science and Technology),
Hyunchul Cho(Korea Institute of Science and Technology)
- PP018** 116 **Thermal Characteristics of Sintered-PEEK Powder**
Taeil Yi(Kyungnam University),
Duck Hyun Wang(Kyungnam University),
Taehyun Park(Kyungnam University),
Sung-Min Kang(DAEGUNTECH)
- PP019** 117 **Investigation into Bead Shape Deposited on Inclined Substrate in Direct Energy Deposition Process**
Gwang Yong Shin(Korea Institute of Industrial Technology),
Ki Yong Lee(Korea Institute of Industrial Technology),
Do Sik Shim(Korea Maritime and Ocean University)
- PP020** 118 **A Study on the Control of PET Nano Fiber Shape and Manufacturing Process of Filter Medium Using Electrospinning Method**
Namsu Kwak(Korea Electronics Technology Institute),
Chouljun Choi(Korea Electronics Technology Institute),
Jeongji Lee(Korea Electronics Technology Institute),
Inpyo Cha(Korea Electronics Technology Institute)
- PP021** 119 **Micro Drilling of Fused Silica and Prevention of Edge Chipping**
Pyeong An Lee(Soongsil University),
Bo Hyun Kim(Soongsil University),
Yung Na(Soongsil University)
- PP022** 122 **Fabrication of Spiral Phase Plate Via Servo-Assisted Diamond Turning**
Geon Hee Kim(Korea Basic Science Institute),
Soonkyu Je(Korea Basic Science Institute),
Byeongjoon Jeong(Korea Basic Science Institute)

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- PP023** 137 **Development of the High Speed and Precision PBF 3D Printing Process Equipment for Biomedical Applications**
MinHa Kim(TOPnC Co., LTD.),
DongSoo Kim(Hanbat National University),
Kokloku Emmanuel(Hanbat National University)
- PP024** 141 **Effects of Ice-backup on Deburring in CFRP Composite by Cryogenic Assisted Ultrasonic Drilling**
KiMoon Park(Yeungnam University),
TaeJo Ko(Yeungnam University),
Zhen Yu(Yeungnam University)
- PP025** 166 **Surface Modification of Metal Additively Manufactured Parts by the Large Pulsed Electron Beam**
Eunju Park(Ulsan National Institute of Science and Technology),
Namhun Kim(Ulsan National Institute of Science and Technology),
Jisoo Kim(Ulsan National Institute of Science and Technology),
Hyung Wook Park(Ulsan National Institute of Science and Technology)
- PP026** 171 **Analysis of Diamond Turning Tool Marks According to Variation of Machining Direction in MRF**
Hwan-Jin Choi(Korea Basic Science Institute),
Geon-Hee Kim(Korea Basic Science Institute),
Min-Woo Jeon(Korea Basic Science Institute)
- PP027** 184 **Effect of Friction conditions on Material Flow in FE analysis of Al Piston Forging Process**
SEONGWON LEE(Korea Institute of Industrial Technology),
JUNGMIN LEE(Korea Institute of Industrial Technology),
JAEWAN JO(Korea Institute of Industrial Technology),
MANSOO JOUN(Gyeongsang National University)
- PP028** 191 **Backward Can Extrusion Process Design of Aluminum Square Cup for Battery of Electric Vehicle**
SEONGWON LEE(Korea Institute of Industrial Technology),
JUNGMIN LEE(Korea Institute of Industrial Technology),
MANSOO JOUN(Gyeongsang National University)
- PP029** 193 **Effect of Anisotropy at the Compressive Buckling Behavior of Cylindrical Lattice Structure Manufactured by FDM**
Beom-Gyun Jeong(Kunsan National University),
Ki-Weon Kang(Kunsan National University),
Ung-Won Park(Kunsan National University),
Ji-Won Jin(Jeonbuk Institute of Automotive Convergence Technology)
- PP030** 202 **Incremental Forming Process of the Light-weight Materials Using Local Heating**
Chang-Whan LEE(Seoul National University of Science and Technology)

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- PP031** 216 **Design of Multipass Wire Drawing Process for Fine Rhodium Wire**
Sung-Yun Lee(Korea Institute of Industrial Technology),
Sang-Kon Lee(Korea Institute of Industrial Technology),
In-Kyu Lee(Korea Institute of Industrial Technology),
Dae Hye Kim(Korea Institute of Industrial Technology),
Jae-Wook Lee(Korea Institute of Industrial Technology),
Yong-Jae Cho(Korea Institute of Industrial Technology),
Myeong-Sik Jeong(Korea Institute of Industrial Technology)
- PP032** 235 **Deposition Characteristics of AlSi12 Powders Deposited by Direct Laser Melting**
Jaye Seo(Chonnam National University),
Do Sik Shim(Korea Maritime and Ocean University),
Hi Seak Yoon(Chonnam National University),
Ki Yong Lee(Korea Institute of Industrial Technology)
- PP033** 239 **Chemical Activation Using Minimum Quantity Slurry Mist in Cu CMP**
Dasol Lee(Pusan National University),
Haedo Jeong(Pusan National University),
Seonho Jeong(Pusan National University),
Hyunjin Kim(Pusan National University),
Byeongjun Pak(Pusan National University)
- PP034** 240 **Effect of Chemical Additives on Tool Mark Removal in Aluminum CMP**
Kihun Lee(Pusan National University),
Haedo Jeong(Pusan National University),
Seonho Jeong(Pusan National University),
Hyunjin Kim(Pusan National University),
Byeongjun Pak(Pusan National University)
- PP035** 241 **Planarization Modeling Using Contact Mode Between Pad Asperity and Device Pattern During CMP**
HyunJin Kim(Pusan National University),
HaeDo Jeong(Pusan National University),
Byeongjun Pak(Pusan National University),
Dasol Lee(Pusan National University),
Seonho Jeong(Pusan National University)
- PP036** 244 **Zone Dwell Time Control of Swing Arm Conditioner During CMP**
Donghwan Lee(Pusan National University),
Heado Jeong(Pusan National University),
Hyoungjae Kim(Korea Institute of Industrial Technology),
Hyunjin Kim(Pusan National University),
Byeongjun Pak(Pusan National University)

Precision Engineering

Room 6 (Mid-sized Hall)

Session Chairs: Jay Jeong(Kookmin University),
Young Hun Jeong(Kyungpook National University)

- PP037** 042 **Development of Longitudinal Control System Using Pedal Information for Heavy Duty Vehicle Platooning**
Hyoungjong Wi(Korea University),
Daehie Hong(Korea University)
- PP038** 044 **Aspheric Surface Reconstruction Using Two Different Interferometry**
TAE HYEON KIM(Gyeongnam National University),
BYOUNG CHANG KIM(Gyeongnam National University),
SUN HYUCK KIM(Gyeongnam National University),
TAE JIN PARK(Gyeongnam National University),
DONG HYUN GO(Gyeongnam National University),
MOON SEONG CHOI(Gyeongnam National University),
GUN HEE KIM(Korea Basic Science Institute),
SANG WON HYUN(Korea Basic Science Institute),
CHANG KYU KIM(Nanosystemz Co.)
- PP039** 047 **A Study on Fabric Angle Detection Based on Image Processing for Weft Straightener**
GyuHyun Bae(Korea Textile Machinery Convergence Research Institute),
Jae Yong Lee(Korea Textile Machinery Convergence Research Institute),
Dae Hee Lee(Korea Textile Machinery Convergence Research Institute),
Young Tae Jung(Il-Sung Co.),
Jae Sung Bae(Il-Sung Co.)
- PP040** 048 **Compliance Control of Independent Drive System with Four Legs and Wheels for Posture Stabilization**
Jin Woo Choi(Korea University),
Daehie Hong(Korea University)
- PP041** 055 **4 DOF Humanoid Robot Arm Control Based on IMU**
Yeonho Ko(Korea University),
Daehie Hong(Korea University),
Wooseok Seo(Korea University),
Joon Ho Kwon(Korea University)
- PP042** 080 **Automatic Bending Device for Surgical Plate**
Youngjun Kim(Korea Institute of Science and Technology),
Seungbin Park(Korea Institute of Science and Technology),
Si-Myung Park(Korea Institute of Science and Technology),
Jeonghwan Lee(Korea Institute of Science and Technology),
Tae-geun Son(Korea Institute of Science and Technology),
Jung-Woo Lee(Kyung Hee University),
Minsoo Park(Seoul National University of Science and Technology),
Gunwoo Noh(Kyungpook National University)

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- PP043** 102 **Robust and Precision Control of Servo Motors Through Disturbance Observer and Real-Time Parameter Identification**
Ji Tae Hong(Korea Electrotechnology Research Institute),
Hong Ju Kim(Korea Electrotechnology Research Institute),
Chang Nho Cho(Korea Electrotechnology Research Institute)
- PP044** 107 **Non-contact Type Elasticity Measurement System Using Infrared**
Min-Jae Jeong(Kangwon National University),
Byeong Hee Kim(Kangwon National University),
Hyung Jin Kim(Kangwon National University),
Young Ho Seo(Kangwon National University)
- PP045** 123 **A Study on Classification of Steel Plate Defects Using Support Vector Machine**
Gyung-Bum Kim(Korea National University of Transportation),
Sung Joo Kim(Korea National University of Transportation),
Eun Doek Cho(Korea National University of Transportation)
- PP046** 139 **Improvement of Motion Pattern Recognition of Using Fast Fourier Transform Data of Acceleration Sensor**
Eun Sung Lee(Kangwon National University),
Byoeng Hee Kim(Kangwon National University),
Hyung Jin Kim(Kangwon National University),
Young Ho Seo(Kangwon National University)
- PP047** 147 **Real-time RNN-based ORB-SLAM**
Kyung-Chan Jin(Korea Institute of Industrial Technology),
Tae-Sung Park(Ilife Innovation)
- PP048** 150 **Measurement Principle of the Position Independent Geometric Errors in a Multi-axis machine Tool Using a Touch Trigger Probe**
Ji Hun Jeong(Hanyang University),
Gyungho Khim(Korea Institute of Machinery and Materials),
Jeong Seok Oh(Korea Institute of Machinery and Materials)
- PP049** 153 **Design, Modeling, and Simulation of Ultrasound-based Stretch Sensor**
Jooyoung Pyun(Hanyang University),
Kwankyu Park(Hanyang University),
Yeongmin Yun(Hanyang University)
- PP050** 164 **Simulation of Accident Situation of AEB Vehicle Using Virtual K-City**
Jay-il Jeong(Kookmin University),
Beenhui Lee(Kookmin University),
Myoungyeon Park(Kookmin University),
Yeonggeol Park(Kookmin University)

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- PP051** 180 **Envelope Energy Transfer of High Sensitive Ultrasonic Wave Based On Methane Mixture Rate**
Seokyeon Im(Tongmyong University),
Kwonse Kim(Kongju National University),
Inho Jeong(Tongmyong University),
Dooseuk Choi(Kongju National University)
- PP052** 185 **Optimization Algorithm for Improving Steering Performance of a Rear-wheeled CTBA Vehicle**
HYUNMO KOO(Kookmin University),
JAY-IL JEONG(Kookmin University),
KYUEUN CHO(Kookmin University),
SANGHYEOP PARK(Kookmin University),
YEONGGEUL PARK(Kookmin University)
- PP053** 204 **Mechanical Evaluation of Free-standing Films Produced by Atomic Layer Deposition**
Joon Hyung Shim(Korea University)
- PP054** 217 **Optimization of the Dimension of Arm Components for a Four-axis Articulated Robot Using a Genetic Algorithm**
Daesun Hong(Changwon National University)
- PP055** 218 **A Parallel-actuated 3-DOF Flexure Stage**
Sunghoon Kang(Ajou University),
Young-Man Choi(Ajou University)
- PP056** 227 **Absolute Optical Thickness Measurement of Transparent Plate Using Fourier Analysis and Unwrapping Correlation**
Yangjin Kim(Pusan National University),
Wonjun Bae(Pusan National University),
Sungtae Kim(Pusan National University)
- PP057** 230 **Detection of Mechanical Vibration Frequencies in Precision Machining Using the Fast Fourier Transform**
Chang-Hyuk Lee(Korea Electrotechnology Research Institute),
Hong-Ju Kim(Korea Electrotechnology Research Institute),
Chang-Nho Cho(Korea Electrotechnology Research Institute),
Heonjong Yoo(Korea Electrotechnology Research Institute),
Yeong-Sik Park(Korea Electrotechnology Research Institute)
- PP058** 231 **Development of Stitching Interferometer for Reflective X-ray Mirror Measurement**
Jangwoo Kim(Pohang Accelerator Laboratory),
Hyo-Yun Kim(Pohang Accelerator Laboratory),
Jun Lim(Pohang Accelerator Laboratory),
Seungyu Rah(Pohang Accelerator Laboratory)

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- PP059** 270 **Improvement of Synchronization in the Industrial Network for Smart Factory**
Hye Yeon Ryu(Pukyong National University),
Kyung Chang Lee(Pukyong National University),
Ki Min Jeong(Pukyong National University),
Young Hun Song(Pusan National University)
- PP060** 278 **Design of Measurement Equipment to Evaluate the Reliability of Screen Surface Material for Kinetic Art**
MiYeon KWON(Korea Institute of Industrial Technology),
Juhea KIM(Korea Institute of Industrial Technology)
- PP061** 309 **A Study on the Measurement Method of Dynamic Regenerative Energy Efficiency of Traction Motor System on Electric Two-wheeled Vehicles**
WaeGyeong Shin(Korea Automotive Technology Institute),
Suyeon Cho(Korea Automotive Technology Institute),
Junsung Park(Korea Automotive Technology Institute)
- PP062** 316 **A Study of Fuel Economy Potential in Super Capacitor Applied Plug-In Hybrid Vehicle Depends of Optimal Target**
Bonhyun Gu(Seoul National University),
Suk Won Cha(Seoul National University),
Changbeom Kang(Seoul National University)
- PP063** 339 **A Technique for Evaluating Volumetric Performance of the Parallel Kinematic Machine Using a Laser Tracker**
Hoon-Hee LEE(Kyungpook National University),
Seung-Han YANG(Kyungpook National University),
Dong-Mok LEE(Maxrotec Co.),
Kwang-II LEE(Kyungil University)
- PP064** 350 **A PMP Control Strategy for Hybrid Electric Vehicle with SOC Prediction by Machine Learning**
Changbeom Kang(Seoul National University),
Heeyun Lee(Seoul National University),
Sukwon Cha(Seoul National University)
- PP065** 395 **Effect of External Electric Field on Polishing Characteristics in CMP Process of Sapphire Substrate**
Chuljin Park(Korea Institute of Industrial Technology),
Hyoungjae Kim(Korea Institute of Industrial Technology),
SeokWoo Lee(Korea Institute of Industrial Technology)
- PP066** 415 **Multiple Object Pick and Place Using Reset Network**
Trung Bui(Kyung Hee University),
Kim Wonha(Kyung Hee University)

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- PP067** 425 **Development of CPS Middleware for CNC Machine Tools Based on Machine Data Interface Standards**
Il-Ha Park(Korea Institute of Industrial Technology),
Joo-Sung Yoon(Korea Institute of Industrial Technology),
Yo-Han Jo(Korea Institute of Industrial Technology)
- PP068** 427 **Improvement of Sensitivity in Shadow Moiré Measurement Using LED Light**
Jinwon Joo(Chungbuk National University),
Heejoo Yang(Chungbuk National University)
- PP069** 456 **Dynamic Analysis of Stage with Multiple Bearing Blocks**
Chang Kyu Song(Korea Institute of Machinery and Materials),
Pham Van Dinh(Korea Institute of Machinery and Materials),
Chan Hong Lee(Korea Institute of Machinery and Materials)
- PP070** 468 **Control of a Cable-driven System for Spider-cam**
Kyungkoo Kim(Kumoh National Institute of Technology),
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- PP073** 485 **Real-time Compensation of Tool Center Point Error in Robot Machining Using Laser Tracker**
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Session Chairs: Hugo Rodrigue(Sungkyunkwan University),
Kwang-Il Lee(Kyungil University)

- PP079** 031 **Development of an Automated Electric Snowplow for Vehicles by Using a Sprocket and Chain for Improving Durability**
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- PP080** 036 **Message Transmission Via Electrically-Elicited Tactile Sensations**
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- PP085** 049 **Optimal Design of a Multi-layer Lever type Flexure Hinge Mechanism for High Magnification**
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Yi-Suk Kim(The Catholic University of Korea),
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- PP104** 317 **Parameter Optimization of Material Supply System for Multi-material SLA Using Liquid Bridge**
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Yingjun Quan(Seoul National University),
Sung-Hoon Ahn(Seoul National University),
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- PP106** 334 **Modeling of Anomalous Diffusion for Heterogeneous Nanomachines**
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- PP111** 466 **The Effect of Masai Barefoot Technology Footwear on Lower Extremity Joint Stresses**
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- PP112** 467 **Fabrication of Dry Adhesive by Using Water-based Material**
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- PP113** 476 **A Study on Thermal Conductivity and Mechanical Properties of Carbon Composite for Radiation Fin**
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Na Ra Park(Korea Institute of Carbon Convergence Technology),
Eun Sung Kim(Vision University of Jeonju),
Hee Yong Kang(Chonbuk National University),
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Yong U Lim(Seoul National University of Science and Technology)
- PP115** 481 **Fab-free Fabrication of Flexible Multidimensional Nanopattern Patches Through the Continuous Nanoinscribing and Low-temperature Roll Imprinting Towards Individual and Mobile Applications**
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Jong G. Ok(Seoul National University of Science and Technology),
Dong Kyo Oh(Seoul National University of Science and Technology),
Seungjo Lee(Seoul National University of Science and Technology),
Pyeongsam Ko(Hanbat National University),
Gi-Seok Heo(Korea Institute of Industrial Technology),
Chang-Hun Yun(Korea Institute of Industrial Technology),
Tae-Won Ha(Korea Institute of Industrial Technology),
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Minho Na(Seoul National University of Science and Technology),
Sunmin Jung(Seoul National University of Science and Technology),
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- PP116** 488 **Laser Based Fabrication of Flexible Circuit**
Won Seok Chang(Korea Institute of Machinery and Materials)
- PP117** 491 **Design of a Redundantly Actuated Planar Parallel Kinematic Mechanism for Performing Finish Cut Simultaneously with Laminating Process of FDM 3D Printer**
Minbok Lee(Soongsil University),
Donghun Lee(Soongsil University)
- PP118** 494 **Fabrication of the Complementary Plasmonic Nanostructures as Biosensors Using Nano-transfer Printing Method**
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 Yong Son(Korea Institute of Industrial Technology),
 Jieun Lee(Korea Institute of Industrial Technology),
 Jeanho Park(Korea Institute of Industrial Technology),
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 Myoung Pyo Hong(Korea Institute of Industrial Technology),
 Young Suk Kim(Kyungpook National University),
 Ji Hyun Sung(Korea Institute of Industrial Technology),
 Woo Sung Kim(Korea Institute of Industrial Technology),
 Min Gyu Lee(Korea Institute of Industrial Technology),
 Tae Hoon Choi(Korea Institute of Industrial Technology),
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 Seung-Jae Lee(Wonkwang University),
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 Young-Sam Cho(Wonkwang University),
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 Jongkyeong Lim(Pohang University of Science and Technology),
 Dong-Joon Won(Pohang University of Science and Technology),
 Young Kwon Kim(Samsung Electronics),
 In Ho Choi(Samsung Electronics)

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Sung Joon Hong(Ulsan National Institute of Science and Technology),
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Hochan Kim(Andong National University),
Taewon Seo(Andong National University),
Yeungchan Kim(Andong National University),
Kihong Shin(Andong National University),
Chulho Yang(Andong National University),
Jeongmin Kim(Andong National University),
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NARA PARK(Korea Institute of Carbon Convergence Technology),
Joonhyuk Song(Korea Institute of Carbon Convergence Technology),
Myeonghan Yoo(Korea Institute of Carbon Convergence Technology),
MinSeok Moon(Korea Institute of Carbon Convergence Technology),
Won Tae KIM(Korea Institute of Carbon Convergence Technology),
Jeha Oh(Korea Institute of Carbon Convergence Technology),
Jin-Soo KIM(Jeonju University)
- PP128** 377 **Topology Optimization and 3D Printing of a Customized Rifle Support**
Jung Hwan Park(Seoul National University of Science and Technology),
Keun Park(Seoul National University of Science and Technology),
Bona Goo(Seoul National University of Science and Technology)
- PP129** 381 **Effect of Printing Conditions on Material Anisotropy in DLP 3D Printing**
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Keun Park(Seoul National University of Science and Technology),
Sung Eun Song(Carima Inc.)
- PP130** 514 **Fabrication of Curved Tactile Sensor**
In Hwan Lee(Chungbuk National University),
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Ho-Chan Kim(Andong National University),
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Organized Session**Room 6** (Mid-sized Hall)***System Engineering using Computational Mechanics*****Session Chair: Baeksuk Chu**(Kumoh National Institute of Technology)

- PP131** 054 **Influence of Furnace Design and Drawing Conditions on Heating and Cooling of Glass Fiber in Optical Fiber Draw Furnace**
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 Kyoungjin Kim(Kumoh National Institute of Technology)
- PP132** 250 **Investigation of Ball Skidding Behavior in Angular Contact Ball Bearings Under Radial Load and Angular Misalignment**
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 Seong Wook Hong(Kumoh National Institute of Technology),
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- PP133** 251 **Performance of Delay-Time Adjustable Input Shaping Method for Positioning Systems Subject to Repetitive Motion**
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 Seong Wook Hong(Kumoh National Institute of Technology),
 Sun Woong Kwon(Kumoh National Institute of Technology),
 Joung Su Kim(Photomechanic Co., Ltd.)
- PP134** 291 **An Open Source OpenFOAM Based Radiative Transfer Equation Solver**
 Dayoon Jeong(Kumoh National Institute of Technology),
 Euntaek Lee(Kumoh National Institute of Technology)
- PP135** 298 **Design and Control of Robot Gripper with Finger Motion Recognition Using Flex Sensor**
 SEUNG UK JANG(Kumoh National Institute of Technology),
 DONGWON SHIN(Kumoh National Institute of Technology),
 HONG MAN KIM(Kumoh National Institute of Technology),
 SEONG IL KIM(Kumoh National Institute of Technology),
 JUN HO HONG(Kumoh National Institute of Technology)
- PP136** 318 **Non-Dimensional Equation of Motion for Thin Plate in ANCF**
 Minseok Yang(Pusan National University),
 Kunwoo Kim(Korea Institute of Industrial Technology),
 Jaewook Lee(Korea Institute of Industrial Technology),
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- PP137** 348 **Transformable Two-wheeled Mobile Platform for Obstacle Climbing**
 Jihun Ahn(Kumoh National Institute of Technology),
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- PP138** 387 **Hand Gesture Recognition Using Electromyogram Signals**
Do Gyeong Yuk(Kumoh National Institute of Technology),
Jung Woo Sohn(Kumoh National Institute of Technology)
- PP139** 434 **Validation for Tensile, Twisting and Bending Behavior of Bonded Particle Model in Discrete Element Method**
Jaehee Lyu(Kumoh National Institute of Technology),
Junyoung Park(Kumoh National Institute of Technology),
Chulho Yang(Oklahoma State University)
- PP140** 435 **The Influence of Crowd Velocity Distribution and Exit Angle Change for FIS Effects on Psychological Discrete Element Method**
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Junyoung Park(Kumoh National Institute of Technology),
Chulho Yang(Oklahoma State University)
- PP141** 442 **A Realization of Assistive Sign Language Interpretation by Automatic Hand Gesture Sensing and Recognition**
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Kyoungjin Kim(Kumoh National Institute of Technology),
Hyo Jeong Kwak(Kumoh National Institute of Technology),
Su Ju Kim(Kumoh National Institute of Technology),
Sang Su Park(Kumoh National Institute of Technology)
- PP142** 445 **Comparison of Three Different Solutions for Sloshing in a Rectangular Container Under Point-to-point Horizontal Movement**
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- PP143** 450 **Comparative Performance Analysis of Organic Flash Cycle with and without Two Phase Expander**
Kyoung Hoon Kim(Kumoh National Institute of Technology)
- PP144** 326 **Estimation and Validation for Velocity Profile Using Kinematic Theory and Particle Image Velocimetry in One-outlet and Multi-outlet Hoppers for Glass Beads**
Junyoung Park(Kumoh National Institute of Technology),
Miyoung Lee(Kumoh National Institute of Technology),
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Bumcheol Kim(Kumoh National Institute of Technology),
Jongeu Choi(Kumoh National Institute of Technology),
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- PP145** 315 **Development of Temperature-Vibration Failure Prognosis Program for Paper Cup Forming Machine**
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Jaeho Jang(Kumoh National Institute of Technology)

Organized Session**Room 6** (Mid-sized Hall)*Nano Thin-film Synthetic Technology for Machining of CFRP***Session Chair: Hyunkyoo Kweon**(Kumoh National Institute of Technology)

- PP146** 274 **Development of PCD(PolyCrystalline Diamond) Tool for High Speep Milling of CFRP**
JE DOO KIM(YG-1 CO., LTD.),
YOUGN KOON PARK(YG-1 CO., LTD.)
- PP147** 369 **Development HF CVD of Nano-Diamond Coated Tools and Their Cutting Performance in Drilling CFRP**
In Woo Lee(KOREA VACUUM LIMITED)
- PP148** 376 **Development of Endmill for the Optimization of Surface Roughness and Delamination in CFRP Machining**
Byeong-chan Kwon(Konkuk University),
Sung Lim Ko(Konkuk University),
Eun Soo Cheon(Konkuk University)
- PP149** 396 **Prediction of Cutting Force in Milling CFRP**
Ngoc Dai Duong Mai(Konkuk University),
Sung Lim Ko(Konkuk University)
- PP150** 502 **Fatigue Analysis of Accumulator Composed of Bladder and Housing**
GeonHui Lee(Kumoh National Institute of Technology),
DaeYou Kim(Kumoh National Institute of Technology),
JangWook Hur(Kumoh National Institute of Technology)

Poster Presentation 2

July 5 (Thursday), 16:10-17:10

Precision Manufacturing Processes 2

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Session Chairs : Shi Hyoung Ryu(Chonbuk National University),
Hyunseop Lee(TongMyong University)

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Jongmoon Park(Kumoh National Institute of Technology),
Myunghoon Oh(Kumoh National Institute of Technology),
Kiyoung Kim(Kumoh National Institute of Technology),
Kazuhiro Ito(Osaka University),
Makoto Takahashi(Osaka University),
Nojin Park(Kumoh National Institute of Technology)
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VIET TIEN LUU(University of Ulsan),
SUNG-TAE HONG(University of Ulsan),
IN-HYE KIM(University of Ulsan),
HYE-JIN JEONG(Seoul National University),
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Taekyoung Kim(Tongmyong University),
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Junyoung Seo(Tongmyong University)
- PP155** 259 **Effect of Free-Abrasive in Lap Grinding of Sapphire Substrate**
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Hyunseop Lee(Tongmyong University),
Taekyoung Kim(Tongmyong University)
- PP156** 260 **Forming Simulation and Experiment of Automobile Center Pillar Manufactured by Local Softening Hot Stamping**
Chang Hee Suh(Daegu Mechatronics & Materials Institute),
Tae Ha Kwon(Daegu Mechatronics & Materials Institute),
Hyo Won Jeon(Daegu Mechatronics & Materials Institute),
Chun Dal Park(Daegu Mechatronics & Materials Institute),
Young Sik Kim(Hwashin Tech),
Ji Hyun Sung(Korea Institute of Industrial Technology)

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Do Sik Shim(Korea Maritime and Ocean University),
Hee Seok Yoon(Chonnam National University),
Ki Yong Lee(Korea Institute of Industrial Technology)
- PP158** 266 **Study of Superhydrophobic Titanium Surface with Effect of Laser Power and Beam Path**
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Doo-Man Chun(University of Ulsan),
Chi-Vinh Ngo(University of Ulsan)
- PP159** 279 **Effect of Electric Current on Recrystallization Kinetics in Ultra-low Carbon Steel**
Ju-Won Park(Seoul National University),
Heung Nam Han(Seoul National University),
Hye-Jin Jeong(Seoul National University),
Moon-Jo Kim(Korea Institute of Industrial Technology),
Sung-Woo Jin(Hyundai Motor Company),
Kyooyoung Lee(POSCO)
- PP160** 282 **Effect of Additive Manufactured Porous Structure Interlayer on the Electrically Assisted Solid-state Pressure Joining**
Yong-Fang Li(University of Ulsan),
Sung-Tae Hong(University of Ulsan),
Sheng-Wei Zhang(University of Ulsan),
Thi Anh Nguyet Nguyen(University of Ulsan),
Ju-Won Park(Seoul National University),
Heung Nam Han(Seoul National University)
- PP161** 284 **Solid State Joining of Steel and Aluminum Alloys by Electrically Assisted Pressure Joining**
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Kim, Jungmyung	PP247 / 371	July 5	16:10-17:10	Room 6
Kim, Jung Sub	PP167 / 359	July 5	16:10-17:10	Room 6
Kim, Jun-Hwan	PP277 / 089	July 5	16:10-17:10	Room 6
Kim, KiGwon	PP169 / 383	July 5	16:10-17:10	Room 6
Kim, Kwangyoung	PP294 / 130	July 5	16:10-17:10	Room 6
Kim, Kyoung-Hak	PP177 / 421	July 5	16:10-17:10	Room 6
Kim, Kyoung Hoon	PP143 / 450	July 5	13:00-14:00	Room 6
KIM, Kyung Jin	PP199 / 050	July 5	16:10-17:10	Room 6
Kim, Kyungkoo	PP070 / 468	July 5	13:00-14:00	Room 6
Kim, Mincheol	PP166 / 355	July 5	16:10-17:10	Room 6
Kim, Min-Geon	PP101 / 287	July 5	13:00-14:00	Room 6
Kim, MinHa	PP023 / 137	July 5	13:00-14:00	Room 6
Kim, Min-Soo	OP061 / 366	July 5	14:10-14:30	Room 2
Kim, Sang-Heon	PP287 / 310	July 5	16:10-17:10	Room 6
Kim, Sang Hoon	PP165 / 320	July 5	16:10-17:10	Room 6
Kim, Seong Hyeon	PP073 / 485	July 5	13:00-14:00	Room 6
Kim, Seongyong	PP279 / 126	July 5	16:10-17:10	Room 6
Kim, Seonjun	PP292 / 375	July 5	16:10-17:10	Room 6
Kim, Shinhoe	OP027 / 040	July 4	17:50-18:10	Room 3
KIM, TAE HYEON	PP038 / 044	July 5	13:00-14:00	Room 6
Kim, Taekyoung	PP154 / 258	July 5	16:10-17:10	Room 6
Kim, Thomas J.Y.	PP258 / 322	July 5	16:10-17:10	Room 6
Kim, Woo-Seok	OP081 / 332	July 5	10:20-10:40	Room 5
Kim, Yangjin	PP056 / 227	July 5	13:00-14:00	Room 6
Kim, Yonghee	PP261 / 245	July 5	16:10-17:10	Room 6
Kim, Yong Tae	PP253 / 108	July 5	16:10-17:10	Room 6
Kim, Yoon-Hwan	PP107 / 341	July 5	13:00-14:00	Room 6
Kim, Young Gon	PP008 / 076	July 5	13:00-14:00	Room 6
KIM, Young-Jin	OP045 / 236	July 4	14:20-14:40	Room 5
Kim, Youngjun	PP042 / 080	July 5	13:00-14:00	Room 6
Kim, Youngshin	PP189 / 480	July 5	16:10-17:10	Room 6

Kim, Youngsik	OP057 / 092	July 5	09:40-10:00	Room 2
Kitakawa, Ren	OP071 / 451	July 5	14:50-15:10	Room 3
Ko, Myeong Jin	PP162 / 285	July 5	16:10-17:10	Room 6
Ko, Yeonho	PP041 / 055	July 5	13:00-14:00	Room 6
Kobilov, Azizjon	PP133 / 251	July 5	13:00-14:00	Room 6
KOO, HYUNMO	PP052 / 185	July 5	13:00-14:00	Room 6
Kuo, Chunliang	OP046 / 416	July 4	14:40-15:00	Room 5
Kuo, Tsai Chi	OP103 / 203	July 5	16:50-16:55	Room 1
Kwak, Namsu	PP020 / 118	July 5	13:00-14:00	Room 6
Kwak, Seonghun	PP219 / 349	July 5	16:10-17:10	Room 6
Kwak, Yunsang	PP095 / 152	July 5	13:00-14:00	Room 6
Kwon, Byeong-chan	PP148 / 376	July 5	13:00-14:00	Room 6
Kwon, Hyeonki	PP071 / 469	July 5	13:00-14:00	Room 6
KWON, MiYeon	PP060 / 278	July 5	13:00-14:00	Room 6
KWON, OYOUNG	PP075 / 508	July 5	13:00-14:00	Room 6
Kwon, Patrick	OP042 / 201	July 4	10:20-10:40	Room 5
Kwon, Patrick	OP043 / 205	July 4	13:40-14:00	Room 5
Kwon, Seok-Jin	PP272 / 243	July 5	16:10-17:10	Room 6
L				
Lee, Chang-Hyuk	PP057 / 230	July 5	13:00-14:00	Room 6
LEE, Chang-Whan	PP030 / 202	July 5	13:00-14:00	Room 6
Lee, Changwoo	PP282 / 223	July 5	16:10-17:10	Room 6
Lee, Chan-Hong	PP181 / 436	July 5	16:10-17:10	Room 6
Lee, Chanwoo	PP273 / 269	July 5	16:10-17:10	Room 6
Lee, Dasol	PP033 / 239	July 5	13:00-14:00	Room 6
Lee, Donghwan	PP036 / 244	July 5	13:00-14:00	Room 6
Lee, Dong-Kyu	PP011 / 091	July 5	13:00-14:00	Room 6
Lee, Dong Yoon	PP183 / 443	July 5	16:10-17:10	Room 6
Lee, Eunho	PP175 / 406	July 5	16:10-17:10	Room 6
Lee, Eun Sung	PP046 / 139	July 5	13:00-14:00	Room 6
Lee, GeonHui	PP150 / 502	July 5	13:00-14:00	Room 6
Lee, Hakjae	OP035 / 065	July 4	14:20-14:40	Room 4
Lee, Haneol	PP266 / 419	July 5	16:10-17:10	Room 6
Lee, Hee Lak	PP016 / 114	July 5	13:00-14:00	Room 6
Lee, Heon	PP246 / 342	July 5	16:10-17:10	Room 6

LEE, Hoon-Hee	PP063 / 339	July 5	13:00-14:00	Room 6
Lee, Hoyoung	PP186 / 455	July 5	16:10-17:10	Room 6
Lee, Hyunseop	PP001 / 012	July 5	13:00-14:00	Room 6
Lee, Hyun-Taek	OP066 / 340	July 5	10:00-10:20	Room 3
Lee, In Hwan	PP130 / 514	July 5	13:00-14:00	Room 6
Lee, In Woo	PP147 / 369	July 5	13:00-14:00	Room 6
Lee, Jae-chul	OP001 / 004	July 4	09:20-09:40	Room 1
LEE, JAEGIL	PP140 / 435	July 5	13:00-14:00	Room 6
Lee, Jaegu	PP109 / 408	July 5	13:00-14:00	Room 6
Lee, Jae Hyuk	PP115 / 481	July 5	13:00-14:00	Room 6
Lee, Jae Yong	PP081 / 037	July 5	13:00-14:00	Room 6
Lee, Jeong-Han	PP182 / 440	July 5	16:10-17:10	Room 6
LEE, JI HOON	PP197 / 028	July 5	16:10-17:10	Room 6
Lee, Jihyeong	PP225 / 418	July 5	16:10-17:10	Room 6
Lee, Jin-Gyu	PP267 / 423	July 5	16:10-17:10	Room 6
Lee, Jiwoong	OP078 / 343	July 5	14:30-14:50	Room 4
Lee, Ji Yun	PP204 / 158	July 5	16:10-17:10	Room 6
Lee, Jong Dae	PP244 / 330	July 5	16:10-17:10	Room 6
Lee, Jong Youl	PP171 / 394	July 5	16:10-17:10	Room 6
Lee, Ju Hwan	PP240 / 224	July 5	16:10-17:10	Room 6
Lee, Junggho	PP284 / 268	July 5	16:10-17:10	Room 6
LEE, JUNG HOON	PP280 / 151	July 5	16:10-17:10	Room 6
Lee, Jungsub	OP025 / 397	July 4	17:10-17:30	Room 3
Lee, Junhan	PP295 / 393	July 5	16:10-17:10	Room 6
Lee, Kang-Hyun	PP230 / 470	July 5	16:10-17:10	Room 6
Lee, Kihun	PP034 / 240	July 5	13:00-14:00	Room 6
Lee, Minbok	PP117 / 491	July 5	13:00-14:00	Room 6
Lee, Minkyo	PP265 / 280	July 5	16:10-17:10	Room 6
Lee, Minsik	PP224 / 413	July 5	16:10-17:10	Room 6
Lee, Pil-Ho	PP012 / 095	July 5	13:00-14:00	Room 6
Lee, Pyeong An	PP021 / 119	July 5	13:00-14:00	Room 6
Lee, Sangmin	PP124 / 189	July 5	13:00-14:00	Room 6
LEE, SEONGWON	PP027 / 184	July 5	13:00-14:00	Room 6
LEE, SEONGWON	PP028 / 191	July 5	13:00-14:00	Room 6
Lee, So Jin	OP080 / 295	July 5	10:00-10:20	Room 5

Lee, Sung Ho	PP112 / 467	July 5	13:00-14:00	Room 6
Lee, Sung-Yun	PP031 / 216	July 5	13:00-14:00	Room 6
Lee, Taekyung	OP012 / 247	July 4	17:10-17:30	Room 1
Lee, Wen-Jen	OP096 / 301	July 5	13:50-13:55	Room 1
Leem, Soo Yeon	PP108 / 362	July 5	13:00-14:00	Room 6
Li, Yong-Fang	PP160 / 282	July 5	16:10-17:10	Room 6
Lim, Hyun-Ho	PP074 / 499	July 5	13:00-14:00	Room 6
LIU, YU	OP039 / 021	July 4	09:20-09:40	Room 5
Luo, Kaifeng	OP094 / 459	July 5	13:40-13:45	Room 1
LUU, VIET TIEN	PP153 / 257	July 5	16:10-17:10	Room 6
Lyu, Jaehee	PP139 / 434	July 5	13:00-14:00	Room 6
Lyu, SungKi	PP286 / 276	July 5	16:10-17:10	Room 6
M				
MA, JOOHYEONG	PP080 / 036	July 5	13:00-14:00	Room 6
Mai, Ngoc Dai Duong	PP149 / 396	July 5	13:00-14:00	Room 6
Mao, Zebing	OP010 / 219	July 4	16:30-16:50	Room 1
Maruyama, Masayuki	A010	July 4	16:10-16:30	Room 2
Mashiko, Yuki	A003	July 4	09:40-10:00	Room 2
Matsumoto, Mitsutaka	OP038 / 389	July 4	16:50-17:10	Room 4
Mohammed, Mohaned Mohammed Mahmoud	OP017 / 265	July 4	10:00-10:20	Room 3
Mondal, Mounarik	OP047 / 303	July 5	09:20-09:40	Room 1
Moon, In Yong	OP026 / 458	July 4	17:30-17:50	Room 3
Moon, Seung Ki	OP040 / 073	July 4	09:40-10:00	Room 5
Muthoka, Ruth M.	PP205 / 161	July 5	16:10-17:10	Room 6
N				
Nabeta, Yuta	OP065 / 504	July 5	15:30-15:50	Room 2
Nam, Eunseok	PP190 / 486	July 5	16:10-17:10	Room 6
Nam, Juhyun	OP062 / 385	July 5	14:30-14:50	Room 2
Nam, Yong-Seok	PP103 / 314	July 5	13:00-14:00	Room 6
Nguyễn, Bùi Quốc Huy	PP102 / 311	July 5	13:00-14:00	Room 6
Nguyen, Cong Hong Phong	OP058 / 169	July 5	10:00-10:20	Room 2
Nguyen, Hoa	OP041 / 094	July 4	10:00-10:20	Room 5
Nguyen, Quang Dang	PP232 / 474	July 5	16:10-17:10	Room 6
Nguyen, Tien Giang	OP028 / 255	July 4	18:10-18:30	Room 3
Nishikawa, Naohiro	A001	July 4	09:00-09:20	Room 2

Noh, Hyun Seok	PP090 / 104	July 5	13:00-14:00	Room 6
O				
Oh, Han Gyoil	PP003 / 027	July 5	13:00-14:00	Room 6
Oh, Se Yeon	PP082 / 039	July 5	13:00-14:00	Room 6
Oh, Won-jung	OP021 / 090	July 4	14:20-14:40	Room 3
Oh, Wook Jin	PP163 / 290	July 5	16:10-17:10	Room 6
Ohmori, Hitoshi	A005	July 4	10:20-10:40	Room 2
Oktaviana, Laily	PP132 / 250	July 5	13:00-14:00	Room 6
P				
Pak, Byeongjun	PP152 / 246	July 5	16:10-17:10	Room 6
Park, Bo Gyu	PP092 / 129	July 5	13:00-14:00	Room 6
Park, Byeonghui	PP274 / 038	July 5	16:10-17:10	Room 6
Park, Chuljin	PP065 / 395	July 5	13:00-14:00	Room 6
Park, Eunju	PP025 / 166	July 5	13:00-14:00	Room 6
Park, Eu-Tteum	PP260 / 075	July 5	16:10-17:10	Room 6
Park, Hyung Gyu	OP014 / 490	July 4	09:00-09:20	Room 3
Park, Hyung Wook	OP070 / 449	July 5	14:30-14:50	Room 3
Park, Il-Ha	PP067 / 425	July 5	13:00-14:00	Room 6
Park, Jaewoong	PP283 / 267	July 5	16:10-17:10	Room 6
Park, Jiwoo	OP085 / 155	July 5	14:50-15:10	Room 5
Park, Jongmoon	PP151 / 194	July 5	16:10-17:10	Room 6
Park, Jongwon	OP075 / 253	July 5	10:20-10:40	Room 4
Park, Jungho	PP206 / 162	July 5	16:10-17:10	Room 6
Park, Jung Hwan	PP128 / 377	July 5	13:00-14:00	Room 6
Park, Junyoung	PP144 / 326	July 5	13:00-14:00	Room 6
Park, Ju-Won	PP159 / 279	July 5	16:10-17:10	Room 6
Park, KiMoon	PP024 / 141	July 5	13:00-14:00	Room 6
Park, Kyung-Hee	PP195 / 530	July 5	16:10-17:10	Room 6
Park, Minyoung	PP013 / 099	July 5	13:00-14:00	Room 6
PARK, NARA	PP127 / 306	July 5	13:00-14:00	Room 6
Park, Sanghyeop	OP032 / 156	July 4	10:20-10:40	Room 4
Park, Sangki	OP076 / 288	July 5	10:40-11:00	Room 4
Park, Seongje	PP121 / 067	July 5	13:00-14:00	Room 6
Park, Simon	OP011 / 228	July 4	16:50-17:10	Room 1
Park, Sunghyun	PP209 / 178	July 5	16:10-17:10	Room 6

Park, Taehyun	PP239 / 200	July 5	16:10-17:10	Room 6
Park, Young-Woo	OP049 / 363	July 5	10:00-10:20	Room 1
Pyun, Jooyoung	PP049 / 153	July 5	13:00-14:00	Room 6
Q				
Quach, Hung	PP178 / 424	July 5	16:10-17:10	Room 6
Quan, Yingjun	PP105 / 319	July 5	13:00-14:00	Room 6
R				
Rhee, Kyehan	PP196 / 013	July 5	16:10-17:10	Room 6
ROH, YOUNG HWA	PP281 / 215	July 5	16:10-17:10	Room 6
Roy, Sunanda	PP208 / 168	July 5	16:10-17:10	Room 6
Ryu, Hye Yeon	PP059 / 270	July 5	13:00-14:00	Room 6
Ryu, Jajun	PP087 / 074	July 5	13:00-14:00	Room 6
RYU, SANGBONG	PP238 / 190	July 5	16:10-17:10	Room 6
S				
Saito, Norihito	A011	July 4	16:30-16:50	Room 2
SANGHOON, LEE	PP114 / 477	July 5	13:00-14:00	Room 6
Seo, Jaye	PP032 / 235	July 5	13:00-14:00	Room 6
Seo, Jungwon	PP270 / 024	July 5	16:10-17:10	Room 6
Seo, Junyoung	PP155 / 259	July 5	16:10-17:10	Room 6
Seo, Kuk-Jin	OP022 / 325	July 4	16:10-16:30	Room 3
Seok, Chang-Sung	PP236 / 515	July 5	16:10-17:10	Room 6
Shie, Ming-You	OP023 / 344	July 4	16:30-16:50	Room 3
Shih, Hsi-Fu	OP008 / 179	July 4	14:40-15:00	Room 1
Shim, Joon Hyung	PP053 / 204	July 5	13:00-14:00	Room 6
Shimizu, Kazuki	A004	July 4	10:00-10:20	Room 2
Shin, Dong-Hwan	PP084 / 046	July 5	13:00-14:00	Room 6
Shin, Dong-Hwan	PP088 / 077	July 5	13:00-14:00	Room 6
Shin, Gwang Yong	PP019 / 117	July 5	13:00-14:00	Room 6
Shin, Jaehak	PP188 / 464	July 5	16:10-17:10	Room 6
Shin, Jeong-Hoon	OP036 / 068	July 4	16:10-16:30	Room 4
Shin, Seunghang	PP290 / 370	July 5	16:10-17:10	Room 6
Shin, Sung-Woo	PP278 / 105	July 5	16:10-17:10	Room 6
Shin, WaeGyeong	PP061 / 309	July 5	13:00-14:00	Room 6
Sim, Joonhyeok	PP193 / 505	July 5	16:10-17:10	Room 6
So, Saerom	PP192 / 497	July 5	16:10-17:10	Room 6

Son, Jong Youn	PP157 / 261	July 5	16:10-17:10	Room 6
Son, Tae-geun	PP017 / 115	July 5	13:00-14:00	Room 6
Son, Yeong Jun	PP104 / 317	July 5	13:00-14:00	Room 6
Song, Chang Kyu	PP069 / 456	July 5	13:00-14:00	Room 6
Suetomi, Takumi	OP072 / 529	July 5	15:10-15:30	Room 3
Suh, Chang Hee	PP156 / 260	July 5	16:10-17:10	Room 6
Sung, Kil-dong	OP082 / 384	July 5	10:40-11:00	Room 5
T				
Takagi, Hitoshi	OP018 / 300	July 4	10:20-10:40	Room 3
Tanawansombat, Titapa	OP098 / 058	July 5	16:25-16:30	Room 1
Tang, Yifan	PP164 / 293	July 5	16:10-17:10	Room 6
Tong, Xin	OP005 / 140	July 4	13:40-14:00	Room 1
Tran, Khac Bien Cuong	PP233 / 475	July 5	16:10-17:10	Room 6
Trinh, Dung Phuong	PP106 / 334	July 5	13:00-14:00	Room 6
Tullu, Abera	OP083 / 489	July 5	14:10-14:30	Room 5
V				
Van Tran, Tien	PP231 / 473	July 5	16:10-17:10	Room 6
W				
Wada, Satoshi	A008	July 4	14:20-14:40	Room 2
Wang, A-Cheng	OP088 / 053	July 5	13:10-13:15	Room 1
Wang, Jane	OP009 / 211	July 4	16:10-16:30	Room 1
Wang, Wei	OP068 / 121	July 5	10:40-11:00	Room 3
Wang, Xinlin	PP256 / 275	July 5	16:10-17:10	Room 6
Wi, Hyoungjong	PP037 / 042	July 5	13:00-14:00	Room 6
Won, Si Tae	PP079 / 031	July 5	13:00-14:00	Room 6
WOO, MINA	OP086 / 192	July 5	15:10-15:30	Room 5
Woo, Wan-Sik	OP020 / 063	July 4	14:00-14:20	Room 3
Wu, Kuan-min	OP102 / 523	July 5	16:45-16:50	Room 1
Wu, Min-Zhe	OP097 / 460	July 5	16:20-16:25	Room 1
X				
Xu, Jun-Xiang	OP101 / 380	July 5	16:40-16:45	Room 1
Y				
Yan, Mu-Tian	OP004 / 071	July 4	10:20-10:40	Room 1
Yang, In-Sang	OP024 / 356	July 4	16:50-17:10	Room 3
Yang, Minseok	PP136 / 318	July 5	13:00-14:00	Room 6

Yang, Yea Jin	PP275 / 064	July 5	16:10-17:10	Room 6
Yang, Young Jun	OP031 / 018	July 4	10:00-10:20	Room 4
Yi, Taeil	PP018 / 116	July 5	13:00-14:00	Room 6
Yin, Shaohui	A009	July 4	14:40-15:00	Room 2
Yoo, Kangeun	PP234 / 482	July 5	16:10-17:10	Room 6
Yoo, Myeong Han	PP113 / 476	July 5	13:00-14:00	Room 6
Yoon, Daejhoong	PP083 / 041	July 5	13:00-14:00	Room 6
Yoon, Hae-Sung	OP069 / 426	July 5	14:10-14:30	Room 3
Yoon, Kyung-Taek	PP098 / 198	July 5	13:00-14:00	Room 6
Youn, Sung-Won	OP051 / 367	July 5	10:40-11:00	Room 1
Yu, ChaeRin	PP218 / 307	July 5	16:10-17:10	Room 6
Yu, Jea Hyung	PP242 / 233	July 5	16:10-17:10	Room 6
Yu, Jheng-shian	OP104 / 522	July 5	16:55-17:00	Room 1
YU, MINSOOK	PP009 / 079	July 5	13:00-14:00	Room 6
Yuk, Do Gyeong	PP138 / 387	July 5	13:00-14:00	Room 6
Yuk, SimCheol	PP093 / 142	July 5	13:00-14:00	Room 6
Yun, Haeryong	PP126 / 229	July 5	13:00-14:00	Room 6
Yun, Hyun Do	PP223 / 407	July 5	16:10-17:10	Room 6
Yun, Suseong	PP100 / 263	July 5	13:00-14:00	Room 6
Z				
Zhang, Shengwei	PP161 / 284	July 5	16:10-17:10	Room 6
Zhao, Shang	PP226 / 437	July 5	16:10-17:10	Room 6



PRESM 2018

International Symposium on
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PRESM 2019

Date. **July 9 / Tue. - 13 / Sat., 2019**

Venue. **The Nalod Da Nang Hotel
Da Nang, Vietnam**

Important Date

Deadline for
Abstract Submission

**January 31
2019**

Deadline for
Early Registration

**March 31
2019**

Date for
Acceptance Notification

**February 28
2019**

Full Paper
Submission(optional)

**April 15
2019**

Organizer

KSE Korean Society for
Precision Engineering



Hanoi University of Science and
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