

International Conference on  
**PR**recision **E**ngineering and **S**ustainable **M**anufacturing

# PRESM 2023

**July 16** Sun – **21** Fri, 2023

**Bankoku Shinryokan,**  
Okinawa, Japan

**PROGRAM BOOK**

 <http://www.presm.org>

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## Program & Proceedings

International Conference on  
**PR**recision **E**ngineering and **S**ustainable **M**anufacturing

# PRESM 2023

**July 16** Sun – **21** Fri, 2023

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## Welcome Message

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### Welcome to PRESM 2023,



On behalf of all the committee members of PRESM 2023 and Korean Society for Precision Engineering (KSPE), we would like to thank all guest speakers, co-organizers and governmental supporters for PRESM 2023 which will be held from July 16 to July 21, 2023, in Okinawa, Japan.

Since 2011, PRESM has been dedicated to the development of precision engineering and sustainable manufacturing for the benefit of global society. However, in the past three years, we have had to face to the unprecedented challenges of COVID-19. At this moment, we must prepare for the 'new normal' in all environments including precision engineering. The more the environment changes, the more important the exchange and development of science and technology becomes. To this end, PRESM 2023 has decided to be held in Okinawa, Japan with international cooperation 4 years after PRESM 2019, in Danang, Vietnam.

In these days, the importance of "Smart & Green" is increasing in all fields including precision engineering. PRESM 2023, based on the unique field of precision engineering, will ride the flow of the 4th industrial revolution and create a plaza that approaches the future value of Smart & Green. In particular, from PRESM 2021, the program has been significantly improved to increase audience concentration and to provide high-quality presentations, and in PRESM 2023, more advanced programs are planned.

Although it is still difficult for researchers from all over the world to freely meet and have active and in-depth academic exchanges as before, I sincerely hope that PRESM 2023, which is preparing to hold the face-to-face meeting, will be a fruitful academic conference for all participants. We will do our best for PRESM 2023 in the given environment.

Finally, I would like to express my gratitude to the all guest speakers who will give distinguished presentations despite their busy schedules. With your participation, we are confident that PRESM 2023 will be enjoyable and meaningful to everyone. Thank you.

**Chair of PRESM 2023**

Dr. Seok-Woo Lee, Korea Institute of Industrial Technology (KITECH), Korea  
Korean Society for Precision Engineering

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## Plenary 1

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### Da-Jeng Yao

Professor & General Director  
Department of Power Mechanical Engineering  
National Tsing Hua University (Taiwan)  
Mechanical and Mechatronics System Laboratory  
Industrial Technology Research Institute (Taiwan)  
E-mail: djyao@itri.org.tw, djyao@mx.nthu.edu.tw

### Mobilizing Ecosystem for Digital Transformations and Smart Manufacturing: Experiences from ROC

#### • Keywords •

Smart manufacturing, Digital transformations, AI diagnostic and prognosis, Machinery cloud

#### • Abstract •

In the era of rapid change, technological progress, supremacy, the raging epidemic, inflation, the war between Russian-Ukrainian, and climate change have all led to tremendous changes in global manufacturing. Taiwan, as an industrial division of the supply chain in Asia that causes Taiwan to be a key position and has to respond quickly. Nowadays, we are assisted by consultants to build smart factories systematically and promote the active application of AI in the manufacturing field, from the integration of digital information to the technologies for smart manufacturing in ITRI, such as Prognosis & Diagnosis Maintenance Systems, automatic inspection technologies of AI+AOI, intelligent application of robots, etc. With the explanation of the content in today's topic, the technologies and experiences accumulated in Taiwan will have the opportunity to be used and learned by others.

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**18 July** (Tue)  
**13:00-13:40** (40')

#### Session Chair

Haseung Chung  
(Michigan State University,  
USA)



## Haedo Jeong

Professor

School of Mechanical Engineering, Chemical Mechanical Polishing Laboratory

Pusan National University (Korea)

E-mail: hdjeong@pusan.ac.kr

## The State-of-the-art on Precision Manufacturing Processes in Semiconductor Industry

### • Keywords •

More-than-moore, 3D heterogeneous integration, TSV, Precision manufacturing process

### • Abstract •

Does Homo sapiens truly desire to attain god-like powers, immortality, and happiness through the application of biotechnology and artificial intelligence (AI) by becoming Homo Deus? What is your opinion on the public release of ChatGPT4? Considering its high parallel processing ability, is the GPU with HBM one of the most optimal solutions to create AI device chips? Are we genuinely confronting the end of Moore's law and the emergence of a new paradigm of More-than-Moore for the development of 3D heterogeneous integration? Besides chiplet design, fan-out wafer level packaging (FOWLP) and through silicon via (TSV) which technologies are vital to realize 3D chips? Is precision manufacturing a necessary requirement for assembling or stacking multiple chiplets, interposer, and packaging substrate to achieve 3D heterogeneous integration? Is TSV an innovative interconnect technology that allows for small form factor, high performance, and low manufacturing cost when compared to wire bonding? Which key technologies are involved in TSV in via drilling, via filling, chemical mechanical planarization (CMP), cleaning, stacking alignment, microbumping and hybrid bonding? What methods can be utilized to enhance the deep reactive ion etching (DRIE) Bosch process for reducing via drilling time? How can via filling electroplating (EP) be accomplished without any voids or defects with a diameter of less than 1  $\mu\text{m}$  and an aspect ratio greater than 10? Can current grinding technologies thin wafers down to 1  $\mu\text{m}$  thickness with a uniformity of less than 10%? In order to achieve strong hybrid bonding of both copper and oxide, how much does the CMP reduce the dishing amount of copper? Is brush cleaning the optimal approach for eliminating particles generated by the CMP process? Finally, as a precision manufacturing engineer, why not take up the challenge of the More-than-Moore era?

**19 July** (Wed)  
**13:00-13:40** (40')

### Session Chair

Sang Won Lee  
(Sungkyunkwan University,  
Korea)

## Plenary 3

---



### Masanori Kunieda

Professor

Department of Precision Engineering

The University of Tokyo (Japan)

E-mail: kunieda@edm.t.u-tokyo.ac.jp, kunieda.masanori@gmail.com

### Adventures with EDM and Forthcoming Adventures for Future

#### • Keywords •

Electrical discharge machining, Material removal rate, Inter-electrode gap, High-speed video camera simulation

#### • Abstract •

Electrical discharge machining (EDM) is categorized as one of the non-traditional machining methods. However, since it is widely being used in manufacturing, it is becoming a normal method, not a non-traditional method anymore. Nevertheless, EDM has a hidden possibility to make a leap to another development stage, if its major problem of low material removal rate can be solved. This problem is based on the fact that the percentage of the removal volume to the total volume of the melt pool in the discharge crater, which is named removal efficiency, is not higher than several %. To solve this problem, researchers in this field are trying to understand the removal mechanism which is not yet elucidated sufficiently. Due to recent advances in high-speed video camera and multi-physics simulation software, the complicated phenomena in the EDM gap are being clarified. Direct observation through transparent electrodes which are electrically conductive also helped deepen the fundamental insight into the process. Based on these studies, a lot of ideas to increase the removal efficiency are being proposed. Selection of the dielectric fluid and atmosphere in the discharge gap is one of the methods to enhance the material removal during discharge and cool the discharge spot during the interval. Recently, it was found that the thermophysical properties of the tool electrode influence the material removal on the workpiece. Changing the waveform of the discharge current pulse, which can be generated arbitrarily thanks to the high-frequency response of advanced electric devices, may be another promising approach. Simulations of gap phenomena in sinking and wire EDM are also important because increasing the removal efficiency in many cases results in increase in the tool electrode wear and wire electrode breakage, in sinking and wire EDM, respectively. Although there is no decisive method yet, fundamental studies on EDM may create a breakthrough in EDM technologies.

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**20 July** (Thu)  
**13:00-13:40** (40')

#### Session Chair

Bo Hyun Kim  
(Soongsil Universtiy, Korea)

## Keynote Speech

**Chien-Sheng Liu****Professor**

Department of Mechanical Engineering  
National Cheng Kung University (Taiwan)

**Title** Measurement of Geometric Errors in Rotary Axes on Five-axis Machine Tools

**Matej Sulitka****Professor**

Faculty of Mechanical Engineering, Department of Production Machines and Equipment  
Czech Technical University in Prague (Czech Republic)

**Title** Digital Twins of Machines and Processes for Smart Manufacturing

**Sangkee Min****Professor**

Department of Mechanical Engineering  
University of Wisconsin-Madison (USA)

**Title** Real-time Inferencing and Anomaly Detection in Manual Assembly Operation Using Deep Learning

**Seung Ki Moon****Professor**

School of Mechanical and Aerospace Engineering  
Nanyang Technological University (Singapore)

**Title** Key Enabling Technologies for Digital Manufacturing in Smart Factory

**Sang C. Lee****Senior Researcher**

Division of Intelligent Robot  
Daegu Gyeongbuk Institute of Science & Technology (Korea)

**Title** Paradigm Shift of Collaborative Robot Era from Simple following to Complex Human Robot Interaction

## Keynote Speech

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### Jonghyun Park

**Professor**

Department of Mechanical and Aerospace Engineering  
Missouri University of Science & Technology (USA)

---

**Title** Advanced Manufacturing Solutions for Sustainable Energy Storage



### Chunhua Zheng

**Professor**

Department of Mechanical Engineering  
Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences (China)

---

**Title** Management Strategies of New Energy Vehicles based on Machine Learning



### Yuya Morimoto

**Professor**

School of Fundamental Science and Engineering  
Waseda University (Japan)

---

**Title** Biohybrid System Powered by Cultured Tissue Formed with Biofabrication Technology



### Yuta Kurashina

**Professor**

Division of Advanced Mechanical Systems Engineering, Institute of Engineering  
Tokyo University of Agriculture & Technology (Japan)

---

**Title** Heart Regeneration with iPS Cell-derived Cardiomyocytes Contributed by Using Ultrasound and Hydrogel



### Soo Hyeon Kim

**Professor**

Lecturer for Institute of Industrial Science  
The University of Tokyo (Japan)

---

**Title** Advanced Biomedical Microsystems for Precise Liquid Biopsy Assay

## Keynote Speech

**Martin Kaltenbrunner****Professor**

Soft Matter Physics Division, LIT Soft Materials Lab  
Johannes Kepler University Linz (Austria)

**Title** Sustainable Soft Electronic and Robotic Systems

**Naoji Matsuhisa****Professor**

Department of Informatics and Electronics, Institute of Industrial Science  
The University of Tokyo (Japan)

**Title** Skin-conformable Sensors and Displays for Future Wearable  
Technology

**Satoru Kidoaki****Professor**

Institute for Materials Chemistry and Engineering  
Kyushu University (Japan)

**Title** Mechanobiological Design of a Postoperative-placing Matrix for  
Selective Capture and Elimination of Residual Cancer Cells

**Toshiro Ohashi****Professor**

Division of Mechanical and Aerospace Engineering, Faculty of Engineering  
Hokkaido University (Japan)

**Title** Mechanical Properties of Cellular Primary Cilia and Mechanosensing  
Mechanism

**Steven Schmid****Professor**

Department of Mechanical Engineering  
The University of North Carolina at Charlotte (USA)

**Title** Additive Manufacturing of Silicon Carbide

## Keynote Speech

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### Yuki Shimizu

**Professor**

Division of Mechanical and Space Engineering  
Hokkaido University (Japan)

---

**Title** Precise Evaluation of a Scale Grating for Precision Metrology



### Sheng-Shian Li

**Professor**

Institute of NanoEngineering and MicroSystems, Department of Power Mechanical Engineering  
National Tsing Hua University (Taiwan)

---

**Title** MEMS Vibration Sensors for Smart Manufacturing



### Jun Shimizu

**Professor**

Department of Mechanical Systems Engineering  
Ibaraki University (Japan)

---

**Title** Enhancement of Tribological Properties by Surface Texturing Using Vibration-assisted Cutting



### Hao Wang

**Professor**

Department of Mechanical Engineering  
National University of Singapore (Singapore)

---

**Title** Advances in Augmented Ultraprecision Machining Technology



### Kazuto Yamauchi

**Professor**

Department of Precision Engineering and Applied Physics, Graduate School of Engineering  
Osaka University (Japan)

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**Title** Catalyst Referred Etching Method for High Precision Optical Elements

PRESM 2023 Program

Program at a Glance

| JULY  | 16 (Sun)                          | 17 (Mon)   | 18 (Tue)  | 19 (Wed)  | 20 (Thu)   | 21 (Fri)  |
|-------|-----------------------------------|--|---|---|--|---|
| 08:00 |                                   | Registration Open<br>11:00-17:00   | Registration Open<br>8:10-17:00   | Registration Open<br>8:10-17:00   | Registration Open<br>8:10-16:00  | <b>Technical Tour</b><br>at<br>Okinawa Institute of<br>Science & Technology<br>(OIST) |
| 09:00 |                                   |  | <b>T1</b><br><b>Focus Session C</b><br>Advanced Material<br>and Manufacturing   | <b>W1</b><br><b>Focus Session G</b><br>Emerging<br>Biofabrication<br>Technology for Medical<br>Applications                   | <b>H1</b><br><b>Focus Session K</b><br>Korea-Germany<br>Intelligent<br>Manufacturing System  |   |
|       |                                   |  | Coffee Break  | Coffee Break  | Coffee Break   |   |
| 10:00 |                                   |  | <b>T2</b><br><b>Focus Session D</b><br>Future Mobility and its<br>Smart Manufacturing   | <b>W2</b><br><b>Focus Session H</b><br>Micro/Nano Systems   | <b>H2</b><br><b>Focus Session L</b><br>Precision<br>Measurement for<br>Precision Engineering |   |
| 11:00 |                                   | Registration Open  |   |   |  |   |
| 12:00 |                                   | Lunch  | Lunch   | Lunch   | Lunch  |   |
| 13:00 |                                   |  | <b>Plenary Session 1</b><br>Prof. Da-Jeng Yao   | <b>Plenary Session 2</b><br>Prof. Haedo Jeong   | <b>Plenary Session 3</b><br>Prof. Masanori Kunieda   |   |
|       |                                   |  | Break   | Break   | Break  |   |
| 14:00 |                                   | Opening  | <b>T3</b><br><b>Focus Session E</b><br>Autonomous<br>Robotic System and<br>Applications   | <b>W3</b><br><b>Focus Session I</b><br>Bioelectronics and<br>Wearable Devices   | <b>H3</b><br><b>Focus Session M</b><br>Ultra Precision<br>Machining &<br>Fabrication         |   |
| 15:00 |                                   | <b>M1</b><br><b>Focus Session A</b><br>Smart Technology for<br>Machine Tools<br>& Manufacturing Systems-1<br>Coffee Break  | Coffee Break  | Coffee Break  |  |   |
|       |                                   | <b>Poster Session I</b><br>[Regular Session]<br>1. Manufacturing<br>Processes (1)<br>2. Machine Tools &<br>Systems   | <b>Poster Session II</b><br>[Regular Session]<br>3. Automation,<br>Measurement & Control (1)<br>4. Materials & Design (1)<br>7. New and Renewable<br>Energy<br>8. Sustainable<br>Technology<br>[Special Session]<br>3. Transfer Robot<br>Fabrication and<br>Control for Smart Farm<br>and Smart Factory<br>Applications | <b>Poster Session III</b><br>[Regular Session]<br>4. Materials & Design (2)<br>5. Micro/Nano<br>Technology<br>6. Bio & Health | Coffee Break   |   |
| 16:00 | PRESM2023<br>Committee<br>Meeting | <b>Poster Session IV</b><br>[Regular Session]<br>1. Manufacturing<br>Processes (2)<br>3. Automation,<br>Measurement & Control (2)<br>[Special Session]<br>1. Railway Engineering<br>2. Multidisciplinary<br>Research &<br>Mechatronics for Aero/<br>Defense Applications |   |   |  |   |
|       |                                   | Break  |   |   | Break  |   |
| 17:00 |                                   | <b>M2</b><br><b>Focus Session B</b><br>Smart Technology<br>for Machine Tools<br>& Manufacturing<br>Systems-2   |   |   | <b>T4</b><br><b>Focus Session F</b><br>Green Process in<br>Energy Conversion<br>Systems      |   |
| 18:00 |                                   |  |   |   | <b>Banquet</b><br><br>PRESM2023<br>Awards & Farewell   |   |
| 19:00 |                                   |  |   |   |  |   |
| 20:00 |                                   |  |   |   |  |   |

## PRESM 2023 Program

### Focus Session

#### [A] Smart Technology for Machine Tools & Manufacturing Systems-1

**Introduction** Machine tools and manufacturing systems are very important fields that form the basis of the manufacturing industry, which is currently undergoing innovation such as the 4th industrial revolution. This focus session discusses recent technological advances in machine tools and manufacturing systems, from subtractive manufacturing to additive manufacturing.

**Organizer** Drs. Dong Yoon Lee (Korea Institute of Industrial Technology, Korea)  
Jeong Seok Oh (Korea Institute of Machinery & Materials, Korea)

**PT Date, Time** July 17(Monday), 2023 / 14:30-15:30 (JST, UTC +09:00)

**Details** Session Chairs : Prof. Chien-Sheng Liu (National Cheng Kung University, Taiwan)  
Dr. Dong Yoon Lee (Korea Institute of Industrial Technology, Korea)

| Paper No. | Time                 | Title / Presenter & Authors   |
|-----------|----------------------|---|
| M1-FA1    | 14:30-14:45<br>(15') | New Measures of Interfacial Energy and Entropy on Improving Geometry Deviation and Mechanical Properties when Selective Laser Melting of ANSI 316L Powders<br><b>*Chunliang Kuo</b> (National Taiwan University of Science & Technology, Taiwan),<br><b>Xuancheng Lin</b> (National Taiwan University of Science & Technology),<br><b>Tzuyou Liu</b> (National Taiwan University of Science & Technology) |
| M1-FA2    | 14:45-15:00<br>(15') | Sound Monitoring and Applications for Smart Manufacturing Using MTConnect Framework and Artificial Intelligence<br><b>*Huitaek Yun</b> (KAIST, Korea),<br><b>Eunseob Kim</b> (Purdue University),<br><b>Junyi Yuan</b> (Purdue University),<br><b>Martin B.-G. Jun</b> (Purdue University)  |
| M1-FA3    | 15:00-15:15<br>(15') | Development of Integrated Automatic Milling Process Planning System Using Convolutional Neural Network for 2.5D Parts<br><b>*Chunhui Chung</b> (National Cheng Kung University, Taiwan),<br><b>Hong-Ming Chang</b> (National Cheng Kung University),<br><b>Po-Sung Huang</b> (National Cheng Kung University)   |
| M1-FA4    | 15:15-15:30<br>(15') | Parallel Expansion of Projection-based 3D Printer through Optical Expansion<br><b>*Brian Lee</b> (Sungkyunkwan University, Korea),<br><b>Minsung Kim</b> (Sungkyunkwan University)  |

## PRESM 2023 Program

**[B] Smart Technology for Machine Tools & Manufacturing Systems-2**

PT Date, Time July 17(Monday), 2023 / 16:40-18:00 (JST, UTC +09:00)

Details Session Chairs : Dr. Changju Kim (Korea Institute of Machinery & Materials, Korea)  
Prof. Chunhui Chung (National Cheng Kung University, Taiwan)

| Paper No.         | Time                 | Title / Presenter & Authors   |
|-------------------|----------------------|---|
| M2-FB1<br>Keynote | 16:40-17:05<br>(25') | Measurement of Geometric Errors in Rotary Axes on Five-axis Machine Tools<br><b>*Chien-Sheng Liu</b> (National Cheng Kung University, Taiwan),<br><b>Yu-Ta Chen</b> (National Formosa University),<br><b>Keng-Min Lin</b> (National Cheng Kung University)  |
| M2-FB2<br>Keynote | 17:05-17:30<br>(25') | Digital Twins of Machines and Processes for Smart Manufacturing<br><b>*Matej Sulitka</b> (Czech Technical University in Prague, Czech Republic),<br><b>Petr Kolar</b> (Czech Technical University in Prague),<br><b>Jiri Falta</b> (Czech Technical University in Prague),<br><b>Jiri Sveda</b> (Czech Technical University in Prague),<br><b>Martin Mares</b> (Czech Technical University in Prague) |
| M2-FB3            | 17:30-17:45<br>(15') | Scalable and Expeditious Additive Manufacturing (SEAM) Process and its Optimization for High Temperature Applications<br><b>*Haseung Chung</b> (Michigan State University, USA),<br><b>Hoa Nguyen</b> (Michigan State University),<br><b>Patrick Kwon</b> (Michigan State University)   |
| M2-FB4            | 17:45-18:00<br>(15') | Influence of the Hot Isostatic Pressing (HIP) on the Different Crack Modes of Additively Manufactured CM247LC<br><b>*Namhun Kim</b> (UNIST, Korea),<br><b>Jageon Koo</b> (UNIST),<br><b>Eunju Park</b> (UNIST),<br><b>Sungwon Park</b> (UNIST)  |

## PRESM 2023 Program

### [C] Advanced Material and Manufacturing

**Introduction** Advanced materials and manufacturing have been the main factors to determine the performance of the products. The researches on these fields have been including the emerging areas such as the machining learning, surface functionalization, surface treatment, and laser writing.

**Organizer** Prof. Hyung Wook Park (UNIST, Korea)

**PT Date, Time** July 18(Tuesday), 2023 / 08:30-09:45 (JST, UTC +09:00)

**Details** Session Chairs : Profs. Young-Jin Kim (KAIST, Korea)  
 Namjung Kim (Gachon University, Korea)

| Paper No. | Time                 | Title / Presenter & Authors  |
|-----------|----------------------|--|
| T1-FC1    | 08:30-08:45<br>(15') | Deep Generative Model with Multidimensional Discrete Latent Representation for High-fidelity Digital Materials<br><br><b>*Namjung Kim</b> (Gachon University, Korea),<br><b>Dongseok Lee</b> (Sungkyunkwan University),<br><b>Youngjoon Hong</b> (Sungkyunkwan University)   |
| T1-FC2    | 08:45-09:00<br>(15') | Maskless Micropatterning of Polydopamine for Versatile Surface Functionalization<br><br><b>*Ievgeniia Topolniak</b> (Federal Institute for Materials Research & Testing (BAM), Germany),<br><b>Xenia Knigge</b> (Federal Institute for Materials Research & Testing (BAM)),<br><b>Jörg Radnik</b> (Federal Institute for Materials Research & Testing (BAM)),<br><b>Heinz Sturm</b> (Federal Institute for Materials Research & Testing (BAM)) |
| T1-FC3    | 09:00-09:15<br>(15') | Machine-learning-based Estimation for Compressive Anisotropy of Caliber-rolled Mg Rod<br><br><b>*Taekyung Lee</b> (Pusan National University, Korea),<br><b>Sujeong Byun</b> (Pusan National University),<br><b>Jinyeong Yu</b> (Pusan National University),<br><b>Seho Cheon</b> (Pusan National University),<br><b>Seong Ho Lee</b> (Pusan National University)  |
| T1-FC4    | 09:15-09:30<br>(15') | Duplex Process of Atmospheric Pressure Plasma Nitriding and Post-oxidation on JIS SKD11 Die Steel for Improved its Corrosion and Wear Resistance<br><br><b>*Yu-Lin Kuo</b> (National Taiwan University of Science & Technology, Taiwan),<br><b>Ming-Chun Tsai</b> (National Taiwan University of Science & Technology),<br><b>Jhao-Yu Guo</b> (National Taiwan University of Science & Technology)   |
| T1-FC5    | 09:30-09:45<br>(15') | Direct Laser Writing of Laser-induced-graphene (LIG) Electro-optics<br><br><b>*Young-Jin Kim</b> (KAIST, Korea),<br><b>Seung-Woo Kim</b> (KAIST)   |

PRESM 2023 Program

**[D] Future Mobility and its Smart Manufacturing**

**Introduction** In this focused session, recent efforts to address the issues for the future mobility industries including autonomous vehicles, battery electric vehicles, and fuel cell electric vehicles will be presented. Especially, two keynote speeches will be devoted to the smart/ advanced manufacturing technology applicable to future mobility. Also, two general speeches will be more directly related to the current technical and strategical issues of future mobility. Finally, a recent effort to provide engineers specialized in future mobility technologies to automotive industries will be presented.

**Organizer** Prof. Sung-Tae Hong (University of Ulsan, Korea)

**PT Date, Time** July 18(Tuesday), 2023 / 10:00-11:50 (JST, UTC +09:00)

**Details** Session Chairs : Profs. Sung-Tae Hong (University of Ulsan, Korea)  
Seung Ki Moon (Nanyang Technological University, Singapore)

| Paper No.                | Time                 | Title / Presenter & Authors   |
|--------------------------|----------------------|---|
| T2-FD1<br><b>Keynote</b> | 10:00-10:25<br>(25') | Real-time Inferencing and Anomaly Detection in Manual Assembly Operation Using Deep Learning<br><b>*Sangkee Min</b> (University of Wisconsin-Madison, USA),<br><b>Vignesh Selvaraj</b> (University of Wisconsin-Madison),<br><b>Sung-Hoon Ahn</b> (Seoul National University)   |
| T2-FD2<br><b>Keynote</b> | 10:25-10:50<br>(25') | Key Enabling Technologies Digital Manufacturing in Smart Factory<br><b>*Seung Ki Moon</b> (Nanyang Technological University, Singapore)   |
| T2-FD3                   | 10:50-11:05<br>(15') | Nano-fabricated Solid Oxide Fuel Cells for Future Mobility Applications<br><b>*Yoon Ho Lee</b> (University of Ulsan, Korea)   |
| T2-FD4                   | 11:05-11:20<br>(15') | Life Cycle Analysis. Does Electrification Reduce CO <sub>2</sub> ?<br><b>*Shin Hyuk Joo</b> (Southwest Research Institute, USA),<br><b>Longyu Zhang</b> (Southwest Research Institute),<br><b>Graham Conway</b> (Southwest Research Institute),<br><b>Daniel Christopher Bitsis</b> (Southwest Research Institute),<br><b>Ian Smith</b> (Southwest Research Institute),<br><b>Paul Chambon</b> (Southwest Research Institute) |
| T2-FD5                   | 11:20-11:35<br>(15') | Design of Vaporizing Foil Actuator Welded Joints for Automotive Applications<br><b>*Taeseon Lee</b> (Incheon National University, Korea)  |
| T2-FD6                   | 11:35-11:50<br>(15') | Future Mobility and its Smart Manufacturing: Education Program for the Transition of Automotive Industries at Ulsan<br><b>*Sung-Tae Hong</b> (University of Ulsan, Korea)   |

## PRESM 2023 Program

### [E] Autonomous Robotic System and Applications

**Introduction** Recently, artificial intelligence algorithms are being applied in various robot and automation fields. We would like to present application examples in AGV (Autonomous Guided Vehicle), AMR (Autonomous Mobile Robot), automatic process planning, and robot diagnosis. Through this, we would like to suggest a new research direction for collaborative robots.

**Organizer** Prof. Jay-I. Jeong (Kookmin University, Korea)

**PT Date, Time** July 18(Tuesday), 2023 / 13:50-15:15 (JST, UTC +09:00)

**Details** Session Chairs : Prof. Jay-I. Jeong (Kookmin University, Korea)  
 Dr. Sang C. Lee (Daegu Gyeongbuk Institute of Science & Technology, Korea)

| Paper No.                | Time                | Title / Presenter & Authors   |
|--------------------------|---------------------|---|
| T3-FE1<br><b>Keynote</b> | 13:50-14:15<br>(25) | Paradigm Shift of Collaborative Robot Era from Simple following to Complex Human Robot Interaction<br><br>* <b>Sang C. Lee</b> (Daegu Gyeongbuk Institute of Science & Technology, Korea)   |
| T3-FE2                   | 14:15-14:30<br>(15) | Learning-based Localization Using UWB for the Applications to Human-following Robot<br><br>* <b>Doo Seok Lee</b> (Daegu Gyeongbuk Institute of Science & Technology, Korea),<br><b>Heungju Ahn</b> (Daegu Gyeongbuk Institute of Science & Technology),<br><b>Sang C. Lee</b> (Daegu Gyeongbuk Institute of Science & Technology),<br><b>Chien Van Dang</b> (Daegu Gyeongbuk Institute of Science & Technology) |
| T3-FE3                   | 14:30-14:45<br>(15) | A Mobile Robot with Magnetic Force Control for Inclined Pipes<br><br>* <b>Young-Woo Park</b> (Chungnam National University, Korea),<br><b>Sang Uk Nam</b> (Chungnam National University),<br><b>Myounggyu Noh</b> (Chungnam National University)  |
| T3-FE4                   | 14:45-15:00<br>(15) | Augmented Reality Assisted Human-robot Collaboration in Smart Manufacturing<br><br>* <b>Chih-Hsing Chu</b> (National Tsing Hua University, Taiwan),<br><b>Yu-Lun Liu</b> (National Tsing Hua University)  |
| T3-FE5                   | 15:00-15:15<br>(15) | Localization and Transformation for Indoor Navigation<br><br>* <b>Heung-Ju Ahn</b> (Daegu Gyeongbuk Institute of Science & Technology, Korea),<br><b>Doo Seok Lee</b> (Daegu Gyeongbuk Institute of Science & Technology),<br><b>Sang C. Lee</b> (Daegu Gyeongbuk Institute of Science & Technology)  |

PRESM 2023 Program

**[F] Green Process in Energy Conversion Systems**

**Introduction** In this session, we discuss two critical aspects of energy conversion systems – green production and operation. Especially, we focus on discussions of innovative manufacturing process and energy management/monitoring of batteries, fuel cells and renewable energy systems.

**Organizer** Prof. Suk Won Cha (Seoul National University, Korea)

**PT Date, Time** July 18(Tuesday), 2023 / 16:25-18:00 (JST, UTC +09:00)

**Details** Session Chairs : Profs. Gu Young Cho (Dankook University, Korea)  
Taehyun Park (Soongsil University, Korea)

| Paper No.                | Time                 | Title / Presenter & Authors  |
|--------------------------|----------------------|--|
| T4-FF1<br><b>Keynote</b> | 16:25-16:50<br>(25') | Advanced Manufacturing Solutions for Sustainable Energy Storage<br><b>*Jonghyun Park</b> (Missouri University of Science & Technology, USA)  |
| T4-FF2<br><b>Keynote</b> | 16:50-17:15<br>(25') | Management Strategies of New Energy Vehicles based on Machine Learning<br><b>*Chunhua Zheng</b> (Chinese Academy of Sciences, China)   |
| T4-FF3                   | 17:15-17:30<br>(15') | Vehicle-to-grid and its Optimal Dispatch Control for Grid Load Balancing<br><b>*Jongwoo Choi</b> (Electronics & Telecommunications Research Institute, Korea),<br><b>Wan-Ki Park</b> (Electronics & Telecommunications Research Institute)   |
| T4-FF4                   | 17:30-17:45<br>(15') | An Early Prediction Model for Remaining Useful Life of Lithium Batteries based on Signal Decomposition<br><b>*Kun Xu</b> (Chinese Academy of Sciences, China),<br><b>Yuxiang Cai</b> (Chinese Academy of Sciences),<br><b>Chunhua Zheng</b> (Chinese Academy of Sciences)          |
| T4-FF5                   | 17:45-18:00<br>(15') | Structural Evaluation of Transferred Ultra-thin Pt Nanomesh for Direct Application of Sputtered Electrolyte on Metal Substrate<br><b>*Wonjong Yu</b> (Kyung Hee University, Korea),<br><b>Seonguk Oh</b> (Kyung Hee University),<br><b>Suk Won Cha</b> (Seoul National University) |

## PRESM 2023 Program

### [G] Emerging Biofabrication Technology for Medical Applications

**Introduction** Biofabrication is recognized as an emerging technology creating multiscale 3D architectures composed of various living cells and biomaterials to produce functional tissues and organs expected to be translational in the clinic. To promote scientific exchange, closer networks, and collaborative ties among multidisciplinary researchers, we have invited two keynotes and three distinguished speakers. This session will cover cutting-edge research and future perspectives on biofabrication-assisted medical innovation.

**Organizer** Prof. Jinah Jang (POSTECH, Korea)

**PT Date, Time** July 19(Wednesday), 2023 / 08:30-10:05 (JST, UTC +09:00)

**Details** Session Chairs : Profs. Yun Jung Heo (Kyunghee University, Korea)  
 Yuta Kurashina (Tokyo University of Agriculture & Technology, Japan)

| Paper No.                | Time                 | Title / Presenter & Authors   |
|--------------------------|----------------------|---|
| W1-FG1<br><b>Keynote</b> | 08:30-08:55<br>(25') | Biohybrid System Powered by Cultured Tissue Formed with Biofabrication Technology<br><b>*Yuya Morimoto</b> (Waseda University, Japan)   |
| W1-FG2<br><b>Keynote</b> | 08:55-09:20<br>(25') | Heart Regeneration with iPS Cell-derived Cardiomyocytes Contributed by Using Ultrasound and Hydrogel<br><b>*Yuta Kurashina</b> (Tokyo University of Agriculture & Technology, Japan)  |
| W1-FG3                   | 09:20-09:35<br>(15') | Nanofiber Membranes for Reconstruction of Tissue Barriers and Generation of Uniform Organoids<br><b>*Dong Sung Kim</b> (POSTECH, Korea),<br><b>Jaeseung Youn</b> (POSTECH),<br><b>Dohui Kim</b> (POSTECH)   |
| W1-FG4                   | 09:35-09:50<br>(15') | Development and Characterization of the Electroactive Microwell Array Device to Detect Various Types and Forms of Circulating Tumor Cells<br><b>*Yoshinobu Sugitani</b> (The University of Tokyo, Japan),<br><b>Teruo Fujii</b> (The University of Tokyo),<br><b>Kazunori Nagasaka</b> (Teikyo University),<br><b>Soo Hyeon Kim</b> (The University of Tokyo) |
| W1-FG5                   | 09:50-10:05<br>(15') | Development of in vitro Multiorgan Model by Focusing on the Gut-kidney Axis in Secondary Hyperoxaluria Disease<br><b>*Jungbin Yoon</b> (POSTECH, Korea),<br><b>Jinah Jang</b> (POSTECH),<br><b>Dong-Woo Cho</b> (POSTECH)   |

PRESM 2023 Program

[H] Micro/Nano Systems

**Introduction** Micro/nano material research is being performed in a variety of domains, ranging from simple structure creation to the methodologies for imbuing materials with functionality. Various applications of micro/nano materials and the accompanying process technologies will be covered in this session. These technologies have enormous potential for use in a variety of industries and will give useful insights for extended investigation

**Organizer** Prof. Dong-Weon Lee (Chonnam National University, Korea)

**PT Date, Time** July 19(Wednesday), 2023 / 10:15-11:55 (JST, UTC +09:00)

**Details** Session Chairs : Prof. Dong-Weon Lee (Chonnam National University, Korea)  
Dr. Won Seok Chang (Korea Institute of Machinery & Materials, Korea)

| Paper No.                | Time                 | Title / Presenter & Authors   |
|--------------------------|----------------------|---|
| W2-FH1<br><b>Keynote</b> | 10:15-10:40<br>(25') | Advanced Biomedical Microsystems for Precise Liquid Biopsy Assay<br><b>*Soo Hyeon Kim</b> (The University of Tokyo, Japan)  |
| W2-FH2                   | 10:40-10:55<br>(15') | Management of Temperature Coefficient of Resistance of Carbon Composite by Controlling Filler Alignment<br><b>*Sung-Hoon Park</b> (Soongsil University, Korea),<br><b>Hyunwoo Kim</b> (Soongsil University),<br><b>Ji-Hwan Ha</b> (Soongsil University)   |
| W2-FH3                   | 10:55-11:10<br>(15') | Study on Droplet Trapping Using an EHD Micropump<br><b>*Joon-wan Kim</b> (Tokyo Institute of Technology, Japan),<br><b>Yuya Kondo</b> (Tokyo Institute of Technology),<br><b>Taiki Otomo</b> (Tokyo Institute of Technology),<br><b>Akihiro Yasuda</b> (Tokyo Institute of Technology),<br><b>Tatsuya Matsubara</b> (Tokyo Institute of Technology),<br><b>Kazuhiro Yoshida</b> (Tokyo Institute of Technology) |
| W2-FH4                   | 11:10-11:25<br>(15') | Texture Morphing of Flexible Fin Structures by Dynamic Capillarity<br><b>*Jonghyun Ha</b> (Ajou University, Korea)  |
| W2-FH5                   | 11:25-11:40<br>(15') | Piezoelectric Stretchable Sensor with a Vertical-wavy Structure Fabricated by Combining Dip Coating and Micro-corrugation Process<br><b>*Michitaka Yamamoto</b> (The University of Tokyo, Japan),<br><b>Naoto Tomita</b> (The University of Tokyo),<br><b>Seiichi Takamatsu</b> (The University of Tokyo),<br><b>Toshihiro Itoh</b> (The University of Tokyo)   |
| W2-FH6                   | 11:40-11:55<br>(15') | Conformal Coating of Nanotube Arrays for Energy Applications<br><b>*Hyung Gyu Park</b> (POSTECH, Korea)   |

## PRESM 2023 Program

### [I] Bioelectronics and Wearable Devices

**Introduction** Wearable sensors provide an alternative pathway to clinical diagnostics by exploiting various physical, chemical, and biological sensors to mine physiological information in real time and in a non-invasive or minimally invasive manner with mobile connectivity in autonomously operating. Here, new transdermal drug delivery system by using micro needles patch will be introduced. Moreover, novel fabrication methods to achieve the user-friendliest, low-cost, and safest way for various microneedles devices with vaccine delivery, several medical treatments, and even Bio-sensors' applications.

**Organizer** Prof. Beomjoon Kim (The University of Tokyo, Japan)

**PT Date, Time** July 19(Wednesday), 2023 / 13:50-15:10 (JST, UTC +09:00)

**Details** Session Chairs : Profs. Beomjoon Kim (The University of Tokyo, Japan)  
Gyu Man Kim (Kyungpook National University, Korea)

| Paper No.                | Time                 | Title / Presenter & Authors  |
|--------------------------|----------------------|--|
| W3-F11<br><b>Keynote</b> | 13:50-14:15<br>(25') | Sustainable Soft Electronic and Robotic Systems<br><b>*Martin Kaltenbrunner</b> (Johannes Kepler University Linz, Austria)   |
| W3-F12<br><b>Keynote</b> | 14:15-14:40<br>(25') | Skin-conformable Sensors and Displays for Future Wearable Technology<br><b>*Naoji Matsuhisa</b> (The University of Tokyo, Japan),<br><b>Taizo Tominaga</b> (The University of Tokyo),<br><b>Tokihiko Shimura</b> (The University of Tokyo)                                     |
| W3-F13                   | 14:40-14:55<br>(15') | Design and Development of Miniaturized Microfluidic pH Sensors based on Sb/Sb <sub>2</sub> O <sub>3</sub> for Biomedical Applications<br><b>*Jyoti Jaiswal</b> (Tokai University, Japan),<br><b>Ganesh Kumar Mani</b> (KAIST),<br><b>Kazuyoshi Tsuchiya</b> (Tokai University) |
| W3-F14                   | 14:55-15:10<br>(15') | Microneedle Array Patch (MAP): The Promising Biomedical Device for Total Personal Healthcare<br><b>*Jongho Park</b> (The University of Tokyo, Japan),<br><b>Beomjoon Kim</b> (The University of Tokyo)   |

PRESM 2023 Program

**[J] Cellular Mechanobiology: From Fundamental Science to Translational Applications in Precision Medicine**

**Introduction** Cellular mechanobiology, which studies how cells respond to mechanical cues, can help us develop new treatment strategies for many diseases. This focus session aims to provide an up-to-date overview of the latest advances in cellular mechanobiology research and to promote multidisciplinary approaches to understanding, diagnosing, and treating disease.

**Organizer** Prof. Toshiro Ohashi (Hokkaido University, Japan)

**PT Date, Time** July 19(Wednesday), 2023 / 16:20-17:55 (JST, UTC +09:00)

**Details** Session Chairs : Profs. Jennifer H. Shin (KAIST, Korea)  
Toshiro Ohashi (Hokkaido University, Japan)

| Paper No.                | Time                 | Title / Presenter & Authors   |
|--------------------------|----------------------|---|
| W4-FJ1<br><b>Keynote</b> | 16:20-16:45<br>(25') | Mechanobiological Design of a Postoperative-placing Matrix for Selective Capture and Elimination of Residual Cancer Cells<br><b>*Satoru Kidoaki</b> (Kyushu University, Japan)  |
| W4-FJ2<br><b>Keynote</b> | 16:45-17:10<br>(25') | Mechanical Properties of Cellular Primary Cilia and Mechanosensing Mechanism<br><b>*Toshiro Ohashi</b> (Hokkaido University, Japan)   |
| W4-FJ3                   | 17:10-17:25<br>(15') | Biomechanical Analysis of Osteocytic Spheroids for Bone Tissue Engineering Applications<br><b>*Jeonghyun Kim</b> (Nagoya University, Japan),<br><b>Takashi Inagaki</b> (Nagoya University),<br><b>Eijiro Maeda</b> (Nagoya University),<br><b>Taiji Adachi</b> (Kyoto University),<br><b>Takeo Matsumoto</b> (Nagoya University)  |
| W4-FJ4                   | 17:25-17:40<br>(15') | Classification of Cancer-associated Fibroblasts with Morphodynamic and Motile Feature-based AI Platform<br><b>*Jennifer H. Shin</b> (KAIST, Korea),<br><b>Minwoo Kang</b> (KAIST),<br><b>Somayadineshraj D.</b> (KAIST),<br><b>Chanhong Min</b> (KAIST)   |
| W4-FJ5                   | 17:40-17:55<br>(15') | Assembled Trachea Epithelium and Blood Vessel Endothelium Modular Study for Asthma<br><b>*Hyoryung Nam</b> (POSTECH, Korea),<br><b>Yoo-mi Choi</b> (POSTECH),<br><b>Sungkeon Cho</b> (POSTECH),<br><b>Ge Gao</b> (POSTECH),<br><b>Donghwan Kim</b> (POSTECH),<br><b>Jongmin Kim</b> (POSTECH),<br><b>Hwanyong Choi</b> (POSTECH),<br><b>Se-Hwan Lee</b> (POSTECH),<br><b>Jinah Jang</b> (POSTECH) |

## PRESM 2023 Program

### [K] Korea-Germany Intelligent Manufacturing System

**Introduction** The goal of the Korea-German Intelligent Manufacturing Systems Lab (IMSL) is to create an intelligent manufacturing system that can monitor and analyze information related to the manufacturing system (such as equipment health, product quality, energy efficiency, safety). The lab is a collaboration between Seoul National University in Korea and Fraunhofer IPT/ RWTH Aachen University in Germany. They are developing smart sensors, IoT, digital twins that can collect and analyze data on the condition of materials and equipment in various processes of the manufacturing system, such as machining, 3DP, laser and robotics.

**Organizer** Prof. Sung-Hoon Ahn (Seoul National University, Korea)

**PT Date, Time** July 20(Thursday), 2023 / 08:30-09:55 (JST, UTC +09:00)

**Details** Session Chairs : Profs. Sung-Hoon Ahn (Seoul National University, Korea)  
 Sangkee Min (University of Wisconsin-Madison, USA)

| Paper No.                | Time                 | Title / Presenter & Authors   |
|--------------------------|----------------------|---|
| H1-FK1<br><b>Keynote</b> | 08:30-08:55<br>(25') | Additive Manufacturing of Silicon Carbide<br><b>*Steven Schmid</b> (The University of North Carolina at Charlotte, USA),<br><b>Taylor Barrett-Crutch</b> (The University of North Carolina at Charlotte),<br><b>Tien Herd</b> (The University of North Carolina at Charlotte),<br><b>Brigid Mullany</b> (The University of North Carolina at Charlotte),<br><b>Corson Cramer</b> (Oak Ridge National Laboratory),<br><b>Scott Smith</b> (Oak Ridge National Laboratory) |
| H1-FK2                   | 08:55-09:10<br>(15') | Production Opportunities for Future Energy Storage Systems<br><b>*Daniel Zontar</b> (Fraunhofer Institute for Production Technology IPT, RWTH Aachen University, Germany),<br><b>Toni Voebel</b> (Fraunhofer Institute for Production Technology IPT, RWTH Aachen University),<br><b>Christian Brecher</b> (Fraunhofer Institute for Production Technology IPT, RWTH Aachen University)   |
| H1-FK3                   | 09:10-09:25<br>(15') | Structural Color Sensor Detecting via Image Processing Algorithm with RGB to Hue Transformation<br><b>*Yingjun Quan</b> (Seoul National University, Korea),<br><b>Sung-Hoon Ahn</b> (Seoul National University)   |
| H1-FK4                   | 09:25-09:40<br>(15') | From Discrete to Continuous Production in Hydrogen Technology<br><b>*Toni Voebel</b> (Fraunhofer Institute for Production Technology IPT, Germany),<br><b>Daniel Zontar</b> (Fraunhofer Institute for Production Technology IPT),<br><b>Christian Brecher</b> (Fraunhofer Institute for Production Technology IPT)  |
| H1-FK5                   | 09:40-09:55<br>(15') | Efficient Net Shape Forming of High-strength Sheet Metal Parts by Transversal Compression Drawing<br><b>*David Briesenick</b> (University of Stuttgart, Germany),<br><b>Mathias Liewald</b> (University of Stuttgart)   |

PRESM 2023 Program

[L] Precision Measurement for Precision Engineering

**Introduction** The importance of precision measurement in the field of precision engineering is gradually increasing. In this focus session will cover several topics widely used in advanced precision engineering, such as precision evaluation of a scale grating, thin film measurement for semiconductor and display devices, and refractive index measurement of a glass lens material.

**Organizer** Dr. Jonghan Jin (Korea Research Institute of Standards & Science, Korea)

**PT Date, Time** July 20(Thursday), 2023 / 10:10-12:00 (JST, UTC +09:00)

**Details** Session Chairs : Dr. Jonghan Jin (Korea Research Institute of Standards & Science, Korea)  
Prof. Daewook Kim (University of Arizona, USA)

| Paper No.                | Time                 | Title / Presenter & Authors  |
|--------------------------|----------------------|--|
| H2-FL1<br><b>Keynote</b> | 10:10-10:35<br>(25') | Precise Evaluation of a Scale Grating for Precision Metrology<br><b>*Yuki Shimizu</b> (Hokkaido University, Japan)   |
| H2-FL2<br><b>Keynote</b> | 10:35-11:00<br>(25') | MEMS Vibration Sensors for Smart Manufacturing<br><b>*Sheng-Shian Li</b> (National Tsing Hua University, Taiwan)   |
| H2-FL3                   | 11:00-11:15<br>(15') | Performance Evaluation of Multi-layer Thin-film Thickness Measurement Using Spectral Reflectometry<br><b>*Jungjae Park</b> (Korea Research Institute of Standards & Science, Korea),<br><b>Jaeseok Bae</b> (Meterlab Co., Ltd.),<br><b>Jonghan Jin</b> (Korea Research Institute of Standards & Science)   |
| H2-FL4                   | 11:15-11:30<br>(15') | Measurement of the Refractive Index of a Glass Lens Materials under Controlled Molding Conditions<br><b>*June Park</b> (Korea Photonics Technology Institute, Korea),<br><b>Minwoo Seo</b> (Korea Photonics Technology Institute),<br><b>Eui-Sam Lee</b> (Korea Photonics Technology Institute),<br><b>Young Bok Kim</b> (Korea Photonics Technology Institute),<br><b>Seung Heon Han</b> (Korea Photonics Technology Institute) |
| H2-FL5                   | 11:30-11:45<br>(15') | Hexapod for Mirror Pose Adjustment in Nanoscale<br><b>*Sang Heon Lee</b> (Andong National University, Korea),<br><b>Sang Moon Kim</b> (Andong National University),<br><b>Hagyong Kihm</b> (Korea Research Institute of Standards & Science)   |
| H2-FL6                   | 11:45-12:00<br>(15') | Analysis on Thickness and Refractive Index of Thin-films Using Deep-learning Algorithm<br><b>*Jonghan Jin</b> (Korea Research Institute of Standards & Science, Korea),<br><b>Joonyoung Lee</b> (University of Science and Technology)   |

## PRESM 2023 Program

### [M] Ultra Precision Machining & Fabrication

**Introduction** "Ultra Precision Machining & Fabrication" is a key technology in the advanced manufacturing industry. In this session, we will introduce the ultra-precision manufacturing process technology and its applications in the advanced optics industry

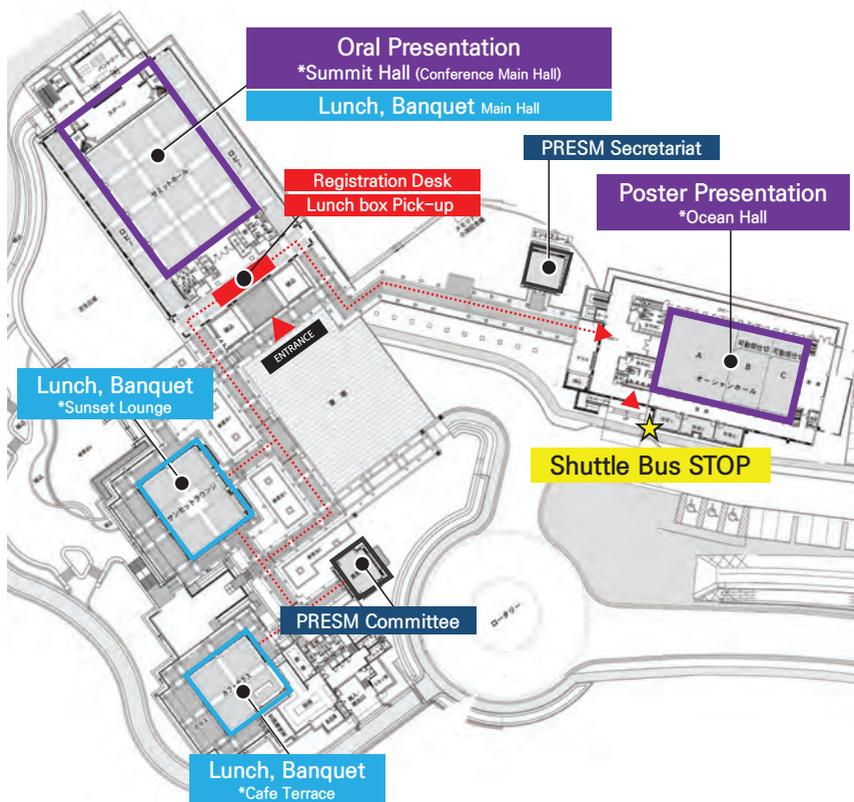
**Organizer** Prof. Geon Hee Kim (Hanbat National University, Korea)

**PT Date, Time** July 20(Thursday), 2023 / 13:50-16:05 (JST, UTC +09:00)

**Details** Session Chairs : Profs. Hyunseop Lee (Dong-A University, Korea)  
 Daewook Kim (University of Arizona, USA)

| Paper No.                | Time                 | Title / Presenter & Authors  |
|--------------------------|----------------------|--|
| H3-FM1<br><b>Keynote</b> | 13:50-14:15<br>(25') | Enhancement of Tribological Properties by Surface Texturing Using Vibration-assisted Cutting<br><b>*Jun Shimizu</b> (Ibaraki University, Japan)  |
| H3-FM2<br><b>Keynote</b> | 14:15-14:40<br>(25') | Advances in Augmented Ultraprecision Machining Technology<br><b>*Hao Wang</b> (National University of Singapore, Singapore)  |
| H3-FM3<br><b>Keynote</b> | 14:40-15:05<br>(25') | Catalyst Referred Etching Method for High Precision Optical Elements<br><b>*Kazuto Yamauchi</b> (Osaka University, Japan)  |
| H3-FM4                   | 15:05-15:20<br>(15') | Infrared Deflectometry for Rapid Freeform Optics Manufacturing Process<br><b>*Daewook Kim</b> (The University of Arizona, Large Binocular Telescope Observatory, USA)  |
| H3-FM5                   | 15:20-15:35<br>(15') | Effect of Surface and Alignment Errors of a Mirror in X-ray Beamline in Synchrotron Radiation Facility Estimated by Ray Tracing with Oasys<br><b>*Hyun-Joon Shin</b> (Chungbuk National University, Korea),<br><b>Eun Chong Kim</b> (Chungbuk National University),<br><b>Hansol Jang</b> (Chungbuk National University),<br><b>Donggeun Kim</b> (Green Optics),<br><b>Minho Seo</b> (Green Optics),<br><b>Eunbyeong Chae</b> (Green Optics) |
| H3-FM6                   | 15:35-15:50<br>(15') | Electromagnet Solenoid Density and Spool Diameter Effect on Aim Accuracy of Magnetically Assisted Deep Hole Drilling<br><b>*Denni Kurniawan</b> (Universiti Teknologi Brunei, Brunei),<br><b>Farhad Najarian</b> (Universiti Teknologi Malaysia),<br><b>M. Y. Noordin</b> (Universiti Teknologi Malaysia),<br><b>Fethma M. Nor</b> (Universiti Teknologi Brunei)   |
| H3-FM7                   | 15:50-16:05<br>(15') | Multiphysics Modelling of Induction Motor and its Vibration Analysis for Bearing Fault Diagnostics<br><b>*Ki-Yong Oh</b> (Hanyang University, Korea),<br><b>DaYeon Jeong</b> (Hanyang University),<br><b>Seho Son</b> (Hanyang University),<br><b>Hyunseung Lee</b> (Hanyang University),<br><b>Kyung Ho Sun</b> (Korea Institute of Machinery & Materials)  |

# Floor Plan



[Address] 905-0026, Bankoku Shinryokan, 1792 Kise, Nago City, Okinawa, Japan



## Conference Information

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### Registration

Registration desk will be located in front of the SUMMIT Hall.

| Category | On-site Registration         |
|----------|------------------------------|
| Date     | from June 1 to July 21, 2023 |
| Regular  | USD 730 / KRW 900,000        |
| Student  | USD 410 / KRW 500,000        |
| Banquet  | USD 90 / KRW 110,000         |

1. Please check your registration with the participant's name at the Registration Desk.
2. The registered participants can receive the name tag, program book, e-Proceedings (USB), and 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 in Cash (USD, KRW) and ONLY for Non-presenter. ; Presenter should complete the Early-Registration.

Conference Information

Lunch

| Date                                 | Time        | Place  |
|--------------------------------------|-------------|--|
| July 17(Mon)-July 20(Thu),<br>4 days | 12:00-13:00 | Lobby & Summit Hall &<br>Sunset Lounge & Cafe Terrace<br>in Bankoku Shinryokan |

\*Lunch box will be served with in front of the SUMMIT Hall.

Banquet

**July 20(Thu), 17:30-20:00**

- Bankoku Shinryokan, Summit Hall (1F)
- Please submit the coupon for Banquet to staff when you enter the Banquet Hall.
- Additional purchase is available at the registration desk only by cash (USD or KRW).



Awards & Farewell

**July 20(Thu), 17:30-18:00**

There will be an announcement of the PRESM2024 conference and closing remarks from the organizing committee in Summit Hall (1F). And the Best Paper Awards and Young Researcher Awards will be announced.

## Conference Information

### Technical Tour

Technical Tour of PRESM 2023 is planned to visit the Okinawa Institute of Science and Technology (OIST) in Okinawa.

**July 21 (Fri) 09:00-13:00**

| Time        | Program  |
|-------------|--|
| 09:00-10:00 | Bankoku Shinryokan → OIST  |
| 10:00-10:25 | Welcome & Greetings  |
| 10:25-10:45 | Tour (Part 1)<br>Group A: Campus and core facilities<br>Group B: Shen Unit lab |
| 10:45-11:05 | Tour (Part 2)<br>Group A: Shen Unit lab<br>Group B: Campus and core facilities |
| 11:05-11:30 | Wrap-up & Farewell   |
| 11:40-13:00 | OIST → Naha International Airport → Naha City (Last Drop Point)                |

※The maximum number of participants is limited and the cost is free.



## Journal Publication

**Selected papers will be published in journals below after passing through peer review.**

- Journal of the Korean Society for Precision Engineering  
 SCOPUS
- International Journal of Precision Engineering and Manufacturing  
 SCIE, SCOPUS / Impact Factor 2.041 (2021)
- International Journal of Precision Engineering and Manufacturing-Green Technology  
 SCIE, SCOPUS / Impact Factor 4.660 (2021)
- International Journal of Precision Engineering and Manufacturing-Smart Technology



## Presentation Guideline

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### Oral

- Presentation time: 15 mins / Presentation: 12 mins & Q&A 3 mins
  - 1) 1st timer alert: 2 mins remaining (10 mins after start)
  - 2) 2nd timer alert: 12 mins after start (end of time)
- Presentation materials: Please bring your PPT material on a USB memory stick.  
; no specific format & template required
- Please upload your presentation material on the computer in the conference room,  
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 who is wearing a blue vest.

### Poster

- Poster size: A0 (841 X 1,189 mm)
- All Presenters should print and bring their posters and no specific format is required.
- The poster Paper Number is attached to the top of the board.
- Items needed to attach the posters will be provided by the PRESM secretariat.
- Please be prepared for 3-5 mins speech and answer questions from the poster session's chair wearing your name tag.
- Please make sure that your poster is appropriately presented to avoid being listed as a no-show poster.

| Category   | Poster Mounting & Presentation Time                            | Date & Location            |
|------------|--|----------------------------|
| Poster I   | Affixation Time: 14:30-15:40<br>Presentation Time: 15:40-16:30 | July 17(Mon)<br>Ocean Hall |
| Poster II  | Affixation Time: 13:30-15:25<br>Presentation Time: 15:25-16:15 | July 18(Tue)<br>Ocean Hall |
| Poster III | Affixation Time: 13:30-15:20<br>Presentation Time: 15:20-16:10 | July 19(Wed)<br>Ocean Hall |
| Poster IV  | Affixation Time: 14:30-16:15<br>Presentation Time: 16:15-17:05 | July 20(Thu)<br>Ocean Hall |

### Presenter Notice

1. Please do not submit presentation materials to the PRESM secretariat.
2. The PRESM secretariat does not offer poster-hanging services for authors.
3. There will be no poster printer or printing shop available near the venue.

July 17 (Mon) 15:40-16:30

Ocean Hall

## 1. Manufacturing Processes

- PP1-001 A004 Research for the Application of Enhanced Representative Heat Source Model of Fiber Laser Welding for 9% Nickel Steel (ASTM A533-1)**  
Changmin Pyo (Korea Institute of Industrial Technology)  
Jaewoong Kim (Korea Institute of Industrial Technology)  
Younghyun Kim (Korea Institute of Industrial Technology)  
Sungwook Kang (Korea Institute of Industrial Technology)  
Ki Yong Lee (Korea Institute of Industrial Technology)  
Kwang Yong Shin (Korea Institute of Industrial Technology)  
Eul Yong Ha (Korea Institute of Industrial Technology)
- PP1-002 A018 An Improved Z-MAP Method Using SQP Algorithm for Surface Topography Simulation of Ball-end Milling**  
Yukun Xiao (Shanghai Jiao Tong University)  
Zhengchun Du (Shanghai Jiao Tong University)  
Guangyan Ge (Shanghai Jiao Tong University)  
Jun Lv (Genertec Machine Tool Engineering Research Institute Co., Ltd. Dalian Company)  
Xiaobing Feng (Shanghai Jiao Tong University)
- PP1-003 A027 Defects-free Surface Modification of Mold Steels Using Tilted Irradiations of Large Pulsed Electron Beam (LPEB)**  
Yonghoon Lee (Kyungpook National University)  
Jisoo Kim (Kyungpook National University)  
Yun Jae Hwang (UNIST)  
Hyung Wook Park (UNIST)
- PP1-004 A033 Research to Optimize of Infrared Ray Heating Technology**  
Haeyong Yun (Korea Institute of Robotics & Technology Convergence)  
Yongjun Choi (Korea Institute of Robotics & Technology Convergence)  
Hunggil Hong (Korea Institute of Robotics & Technology Convergence)  
Hochan Kim (Andong National University)
- PP1-005 A038 Effect of Substrate Stiffness on the Collision Dynamics of a Liquid Droplet**  
Sanghyun Lee (Dong-Eui University)  
Sangmin Lee (Dong-Eui University)  
Seungho Ok (Dong-Eui University)  
Hojin Kim (Dongseo University)

**POSTER 1**

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- PP1-006 A044 Effect of Cutting Properties Using Cryogenic (LN2) Cooling Method in End-milling of Ti-6Al-4V**  
Min-Suk Park (Korea Institute of Industrial Technology)  
Mi-Ru Kim (Korea Institute of Industrial Technology)  
Hoon-Hee Lee (Korea Institute of Industrial Technology)  
Wang-Ho Yun (Korea Institute of Industrial Technology)  
Kwayng-Il Lee (Kyungil University)
- PP1-007 A047 Development of Rapid Cooling Technology for Injection Molds through Active Control of Liquefied Gas**  
Mi Jin Kim (Gwangju University)  
Jae Hyuk Choi (Gwangju University)
- PP1-008 A056 A Study on the Residual Stress Characteristics of UNSM Treatment after Deposition of H13 on Die Steel**  
Ki Yong Lee (Korea Institute of Industrial Technology)  
Gyeong Yun Beak (Gwangju University)  
Gwangyong Shin (Korea Institute of Industrial Technology)  
Changmin Pyo (Korea Institute of Industrial Technology)  
Dosik Shim (Korea Maritime and Ocean University)
- PP1-009 A057 Residual Stress Characteristics according to Inclination Angle during UNSM Treatment of Die Steel**  
Gwangyong Shin (Korea Institute of Industrial Technology)  
Gyeong Yun Beak (Gwangju University)  
Kiyong Lee (Korea Institute of Industrial Technology)  
Jaewoong Kim (Korea Institute of Industrial Technology)  
Dosik Shim (Korea Maritime and Ocean University)
- PP1-010 A064 Direct Micropatterning of Cu Using Polymer Electrolyte Membrane Stamp**  
Atsuki Tsuji (Ritsumeikan University)  
Junji Murata (Ritsumeikan University)
- PP1-011 A067 A Rapid Fabrication of Structural Supercapacitors through Laser Hydrothermal Synthesis of Cobalt Hydroxide on Woven Carbon Fibers**  
Taeyong Kim (Kyungpook National University)  
Jisoo Kim (Kyungpook National University)  
Jaewoo Seo (Kyungpook National University)

- PP1-012 A076 Surface Measurement of Silicon Wafer Using Phase Extraction based on Deep Learning and Fizeau Interferometer**  
Jurim Jeon (Pusan National University)  
Yangjin Kim (Pusan National University)  
Juyoung Yun (Pusan National University)  
Juncheol Bae (Pusan National University)  
Hwan Kim (Pusan National University)
- PP1-013 A077 Design of a Composite Truncated Elliptical Rotary Shell based on Variable-angle Trajectories**  
Jiuru Lu (Donghua University)  
Jun Hu (Donghua University)  
Zhou Yu (Donghua University)  
Kangmei Li (Donghua University)  
Qianqian Cao (Donghua University)  
Chongjun Wu (Donghua University)
- PP1-014 A086 Study on the Influence of Cutting-edge Roundness on Gear Tooth Profile Error in Gear Skiving**  
Shuta Irako (The University of Tokyo)  
Zongwei Ren (The University of Tokyo)  
Taiji Yamada (The University of Tokyo)  
Toru Kizaki (The University of Tokyo)  
Zhenglong Fang (Beihang University)  
Naohiko Sugita (The University of Tokyo)
- PP1-015 A108 Friction Stir Butt Welding of AA6061-T6: Impact of Post-weld Heat Treatment on Microstructure and Mechanical Properties**  
Van Cong Phan (University of Ulsan)  
Sung-Tae Hong (University of Ulsan)  
Soumyabrata Basak (University of Ulsan)  
Meiling Geng (University of Ulsan)  
Hyeon-Seok Choi (University of Ulsan)
- PP1-016 A126 Feasibility Study on the Fabrication of Carbon-nanotube Reinforced Al-Si-Cu Alloy Matrix Composites by Oxygen-replacing Die Casting**  
Seong Hyo Oh (Korea Institute of Industrial Technology)  
Jin Young Park (Korea Institute of Industrial Technology)  
HoJung Kang (Korea Institute of Industrial Technology)  
Yoon Pil Hwan (Korea Institute of Industrial Technology)  
Gyu Heun Lee (Korea Institute of Industrial Technology)

**POSTER 1**

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- PP1-017 A138 Optimization of Design Parameters of Porous Interlayer for Electrically Assisted Pressure Joining**  
Hyeon Seok Choi (University of Ulsan)  
Sung-Tae Hong (University of Ulsan)  
Thanh Thuong Do (University of Ulsan)  
Tu-Anh Bui-Thi (University of Ulsan)  
Su Hyun Choo (University of Ulsan)  
Minh Tien Tran (Konkuk University)  
Dong-Kyu Kim (Konkuk University)
- PP1-018 A154 Evaluation of Mechanical Properties and Thermal Effects of Titanium Alloys Specimens Fabricated to Cryogenic Machining**  
Wang Ho Yun (Korea Institute of Industrial Technology)  
Hoon Hee Lee (Korea Institute of Industrial Technology)  
Hyunglck Kim (Korea Institute of Industrial Technology)  
Kwangll Lee (Kyungil University)
- PP1-019 A158 Evaluation of the Relationship between Grinding Conditions and Removal Depth for Modeling Chemical Removal Action in RISA Grinding**  
Hinata Takamaru (Keio University)  
Yasuhiro Kakinuma (Keio University)  
Naoki Iinuma (Keio University)  
Kentaro Watanabe (Shibaura Machine Co., Ltd.)  
Masahiko Fukuta (Shibaura Machine Co., Ltd.)  
Katsutoshi Tanaka (Shibaura Machine Co., Ltd.)  
Yusuke Chiba (Nikon Corp.)  
Hidebumi Kato (Nikon Corp.)  
Mikinori Nagano (Nikon Corp.)
- PP1-020 A167 Alternative Tempering Process for Post Weld Heat Treatment Using Wire Arc Additive Manufacturing in PWR Repair Welding**  
Junyeong Kim (Chosun University)  
Dongjin Kim (Korea Institute of Industrial Technology)  
Jungsoo Park (Chosun University)  
Seung-Joon Lee (Tech University of Korea)  
Seungyeop Baek (Korea Automotive Technology Institute)  
Min-Su Kim (Korea Institute of Industrial Technology)  
Jaesam Sim (Korea Institute of Industrial Technology)

- PP1-021 A174** **Development of High Efficiency Machining Technology combined with Grinding and Magnetic assisted Polishing for Si<sub>3</sub>N<sub>4</sub> Ceramic Ball Bearing**  
Seung-Min Lee (Gyeongsang National University)  
Tae-Soo Kwak (Gyeongsang National University)  
Ha-Neul Kim (Korea Institute of Materials Science)  
Jae-Woong Ko (Korea Institute of Materials Science)
- PP1-022 A177** **Design and Manufacturing of Anatomical Plates for Clavicles Using Additive Manufacturing**  
Sanghun Lee (Keimyung University)  
Donghuyn Kim (Korea Institute of Industrial Technology)  
Jinhyeok Song (Zyconsi Co., Ltd.)
- PP1-023 A178** **Material Removal Rate Prediction for CMP based on XGBoost Considering Pad Surface Roughness**  
Jongmin Jeong (Pusan National University)  
Haedo Jeong (Pusan National University)  
Seunghun Jeong (Pusan National University)  
Yeongil Shin (Pusan National University)  
Seonho Jeong (Pusan National University)  
Youngwook Park (Korea Institute of Industrial Technology)
- PP1-024 A180** **3D-printed Flexible Piezoelectric PZT-NC Anisotropic Films with Aligned Cellulose Nanofibers**  
Muhammad Latif (Inha University)  
Jaehwan Kim (Inha University)  
Yangxiaoze Jiang (Inha University)  
Jong Min Song (Inha University)
- PP1-025 A186** **3D-printed High Concentration Nanocellulose Crosslinked with Tannic Acid for Environmentally Friendly Structural Applications**  
Yangxiaoze Jiang (Inha University)  
Jaehwan Kim (Inha University)  
Muhammad Latif (Inha University)
- PP1-026 A203** **Study on Surface Machining and Measurement Technology for Optical Parts Using Additive Manufacturing Process**  
Geonhee Kim (Hanbat National University)  
Seonghyeon Park (Hanbat National University)  
Jonggyun Kang (Chungnam National University)  
Joongkyu Ham (Hanbat National University)

## **POSTER 1**

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- PP1-027 A204 A Study on the Change in Surface Characteristics during Ultra-precision Grooving Pattern Machining of Germanium**  
Joong Kyu Ham (Hanbat National University)  
Geon Hee Kim (Hanbat National University)  
Jong Gyun Kang (Hanbat National University)  
Seong Hyeon Park (Hanbat National University)  
Tae Sik Myung (Hanbat National University)  
Young Duk Park (Hanbat National University)
- PP1-028 A228 A Study on the Response Characteristics of Flexible Pressure Sensor according to Sensor Design**  
Chae Young Park (Chungbuk National University)  
In Hwan Lee (Chungbuk National University)  
Ho-Chan Kim (Andong National University)
- PP1-029 A231 A Study on Fabrication for High-aspect-ratio Micro-mesh Pattern Using SPPW Hybrid DMD Process**  
Do Hyeog Kim (Changwon National University)  
Young Tae Cho (Changwon National University)  
Seok Kim (Changwon National University)
- PP1-030 A247 Optimization of Magnetic and Mechanical Properties of Selective Laser Melted NiFe Soft Magnetic Composites**  
Yu-Ming Hsu (National Cheng Kung University)  
Chun Hui Chung (National Cheng Kung University)  
Lien-Kai Chang (National Cheng Kung University)  
Tsung-Wei Chang (National Cheng Kung University)  
Kuan-Di Jiang (National Cheng Kung University)  
Mi-Ching Tsai (National Cheng Kung University)
- PP1-031 A259 Surface Finishing for Corrosion Resistance of Stainless Steel in Marine Environment**  
Rockhoon Jung (Samsung Heavy Industries)
- PP1-032 A280 Optimization of Direct Energy Deposition Process Parameters for Inconel 718 Alloy Using Response Surface Methods**  
Sung Moon Yang (Daegu University)  
Jae Hyun Yu (Daegu University)  
Gi Yong Lee (Korea Institute of Industrial Technology)  
Kwang Yong Shin (Korea Institute of Industrial Technology)

- PP1-033** A282 **Pellet Extrusion Device Design of FDM 3D Printer**  
Jeongmok Han (Dankook University)  
Ji-Hyeon Song (Dankook University)
- PP1-034** A293 **Optimization of YSZ Sputter Parameters for Thickness Uniformity on Large Area Substrate**  
Jaewon Yoo (Seoul National University)  
Suk Won Cha (Seoul National University)
- PP1-035** A300 **Post Heat Treatment Optimization to Tailor the Properties of Automotive Parts in Hot Stamping**  
Seunghoon Cha (Gyeongbuk Technopark)  
Jeongsik Lim (Gyeongbuk Technopark)  
Minsu Ahn (Shinyoung)  
Changrin Lee (Altec)
- PP1-036** A303 **Thermal Analysis of Titanium Alloy with Cryogenic Machining**  
Song Hyeon Ju (Chung-Ang University)  
Jungsoo Nam (Korea Institute of Industrial Technology)  
Seong Hyeon Kim (Korea Institute of Industrial Technology)  
Kyeongun Song (Korea Institute of Industrial Technology)  
Kangwoo Shin (Korea Institute of Industrial Technology)  
Tae-Gon Kim (Korea Institute of Industrial Technology)  
Seok-Woo Lee (Korea Institute of Industrial Technology)
- PP1-037** A306 **Structural Analysis and Damage Mode Analysis for Remanufacturing of a Shaft Used in an Aging Planer Miller**  
Tae Woo Kim (Changwon National University)  
Dae Sun Hong (Changwon National University)  
Il Hwan Park (Changwon National University)  
Sang Seok Seol (Changwon National University)  
Eun Ju Ha (Changwon National University)  
Tae Jong Kim (Daeshin Engineering Co.)
- PP1-038** A308 **Optimization of 3D Printing Parameter Using Screw-based Extruder**  
Song Hyeon Ju (Chung-Ang University)  
Jungsoo Nam (Korea Institute of Industrial Technology)  
Sang Il Kim (Korea Institute of Industrial Technology)  
Kyeongun Song (Korea Institute of Industrial Technology)  
Seong Hyeon Kim (Korea Institute of Industrial Technology)  
Kangwoo Shin (Korea Institute of Industrial Technology)  
Tae-Gon Kim (Korea Institute of Industrial Technology)  
Seok-Woo Lee (Korea Institute of Industrial Technology)

**POSTER 1**

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- PP1-039 A309 Investigation of Chatter Growth and Suppression Characteristics in Spindle Speed Variation Depending on FRF Shape**  
Soohyun Nam (Korea Institute of Industrial Technology)  
Kyung-Hee Park (Korea Institute of Industrial Technology)  
Jungin Byun (Korea Institute of Industrial Technology)  
Hyein Kim (Korea Institute of Industrial Technology)
- PP1-040 A312 Effect of Initial Filament Moisture Content on Mechanical Behavior of ABS 3D FDM Printed Products**  
Seok Hwan Jung (Dankook University)  
Sung-Han Rhim (Dankook University)  
HyunJun Noh (Dankook University)  
Sung Hyeon Yoon (Dankook University)
- PP1-041 A313 Chip Morphology and Tool Wear in Ultrasonic-assisted Side Milling of Titanium Alloys**  
Yen Hao Chang (National Chung Hsing University)  
Jenq-Shyong Chen (National Chung Hsing University)  
Hsiao-Wei Lin (National Chung Hsing University)
- PP1-042 A315 Approach towards Green Manufacturing in Maglev EDM Using Different Bio-dielectrics at Variable Discharge Conditions**  
Rajesh Sahoo (Indian Institute of Technology (ISM) Dhanbad)  
Vivek Bajpai (Indian Institute of Technology (ISM) Dhanbad)  
Nirmal Kumar Singh (Indian Institute of Technology (ISM) Dhanbad)
- PP1-043 A321 Effect of Post-processing on Machinability of Surgical Model Fabricated with Binder Jetting Printer**  
HyunJun Noh (Dankook University)  
Sung Han Rhim (Dankook University)  
Seokhwan Jung (Dankook University)  
Myeong Su Lee (Dankook University)
- PP1-044 A322 Tool Wear Estimation in Milling Process by Combined Classification and Regression Models**  
Hyein Kim (Korea Institute of Industrial Technology)  
Jeongin Koo (Korea Institute of Industrial Technology)  
Soohyun Nam (Korea Institute of Industrial Technology)  
Kyung-Hee Park (Korea Institute of Industrial Technology)

- PP1-045** A323 **A Study on Interaction Characteristics and Channel Fabrication Using Nanosecond Laser on Carbon Nanotube Composites**  
Seungeun Baek (Kongju National University)  
Dongkyoung Lee (Kongju National University)  
Dawit Musse Yasin (Kongju National University)  
Seungjin Lee (Kongju National University)
- PP1-046** A344 **Robust Integer Optimization of Turning Parameters based on Tool Wear and Manufacturing Cost**  
Agus Andrianto (National Cheng Kung University)  
Chunhui Chung (National Cheng Kung University)  
Po-Chieh Wang (National Cheng Kung University)
- PP1-047** A355 **Simulation of Drawing Lithography Models to Fabricate High Aspect Ratio Structures**  
Je Min Lee (Changwon National University)  
Young Tae Cho (Changwon National University)  
Seok Kim (Changwon National University)
- PP1-048** A370 **Study on the Effect of the Built-up-edge on Tool Wear in Machining of STAVAX**  
Sangjin Maeng (Hongik University)  
Jaehoon Ahn (Yonsei University)  
Byung-Kwon Min (Yonsei University)
- PP1-049** A371 **Integrating Remaining Useful Life Prediction Model and Block Replacement Model for Preventive Maintenance in Mechanical Systems**  
Young-Suk Choo (Hanyang University)  
Seung-Jun Shin (Hanyang University)
- PP1-050** A373 **A Study on the Reduction of Micro-surface Deflection Using 6 Sigma**  
Jihye An (Ulsan Technopark)  
Bosung Choi (Ulsan Technopark)  
Dugyoung Lee (Daegu University)
- PP1-051** A374 **Real-time Deposited Geometry Simulation Based Deposition Path Generation in DED Process**  
Segon Heo (Korea Institute of Machinery and Materials)  
Min-Kyo Jung (Korea Institute of Machinery and Materials)  
Taeho Ha (Korea Institute of Machinery and Materials)

## POSTER 1

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- PP1-052 A393 The Effect of Laser Parameters on Removal of by-products for Weld Bead during Laser Cleaning**  
Youngjin Seo (Kongju National University)  
Dongkyoung Lee (Kongju National University)
- PP1-053 A406 Feasibility Study of a Robotic Drilling Process for Additively Manufactured Titanium Alloys**  
Kangwoo Shin (Korea Institute of Industrial Technology)  
Tae-Gon Kim (Korea Institute of Industrial Technology)  
Seok-Woo Lee (Korea Institute of Industrial Technology)  
Jungsoo Nam (Korea Institute of Industrial Technology)  
Seong Hyeon Kim (Korea Institute of Industrial Technology)  
Kyeongun Song (Korea Institute of Industrial Technology)  
Byung-Kwon Min (Yonsei University)
- PP1-054 A408 Effects of Slurry pH on the Gallium Oxide CMP**  
Hokyoung Jung (Korea Institute of Industrial Technology)  
Hyoungjae Kim (Korea Institute of Industrial Technology)  
Youngwook Park (Korea Institute of Industrial Technology)  
Taekyung Lee (Korea Institute of Industrial Technology)  
Doyeon Kim (Korea Institute of Industrial Technology)
- PP1-055 A409 A Study of Comparison with Simulation Results and Amounts of Micro-surface Deflection according to Die Compensation Method**  
Jihye An (Ulsan TechnoPark)  
Bosung Choi (Ulsan TechnoPark)  
Kyung Cheol Kim (Ulsan TechnoPark)
- PP1-056 A415 Improving Cutting Tool Performance through Additive Manufacturing: A Study on Face Cutters Manufactured by Powder Bed Fusion**  
Dong Gyu Kim (Daegu Mechatronics and Materials Institute)  
Byeong Chan Kwon (Daegu Mechatronics and Materials Institute)  
Goo Sang Jung (Conception Co., Ltd.)  
Dong Gil Ahn (Teagu Tec)  
Hyun Kyu Kweon (Kumoh National Institute of Technology)  
Woo Jong Kim (Daegun Technology Co., Ltd.)
- PP1-057 A422 Pad Surface Roughness and Hydrodynamic Pressure Effects on Material Removal in Chemical Mechanical Polishing**  
Youngwook Park (Korea Institute of Industrial Technology)  
Heado Jeong (Pusan National University)  
Hokyoung Jung (Korea Institute of Industrial Technology)  
Hanchul Cho (Korea Institute of Industrial Technology)  
Hyoungjae Kim (Korea Institute of Industrial Technology)

- PP1-058 A426 Enhanced Planarization Model for Copper CMP Considering Temperature and Pressure Distribution on Pattern**  
Yeongil Shin (Pusan National University)  
Haedo Jeong (Pusan National University)  
Youngwook Park (Pusan National University)  
Seonho Jeong (Pusan National University)  
Jongmin Jeong (Pusan National University)  
Seunghun Jeong (Pusan National University)
- PP1-059 A439 Direct Patterning of Cu Trace on 3D Plastic Substrate**  
Woosung Han (Chosun University)  
Jae B. Kwak (Chosun University)  
Jeongheon Lee (Chosun University)
- PP1-060 A448 Effect of Tool Surface on Micro Grinding of Cemented Carbide**  
Bo Hyun Kim (Soongsil University)  
Dae Bo Sim (Soongsil University)  
Ji Hyo Lee (Soongsil University)
- PP1-061 A449 Mechanical and Microstructure Properties of SUS 316L-VCr Tool Steel Multi-materials Fabricated by DED**  
Junyeong Park (Korea Institute of Industrial Technology)  
Jeonghong Ha (Korea Institute of Industrial Technology)  
Chungsoo Kim (Korea Institute of Industrial Technology)  
Dong-Hyun Kim (Korea Institute of Industrial Technology)
- PP1-062 A453 Ni-Fe-CoSe<sub>2</sub> Super Hydrophilic Thin Film Electrodeposited on Ni Foam**  
Chang Hoon Kim (Chosun University)  
Jae B. Kwak (Chosun University)  
Jeongheon Lee (Chosun University)
- PP1-063 A485 Comparative Analysis of CFRP Hole Entrance Quality for the Robotic Drilling Comparat**  
Taehwa Hong (Korea Institute of Industrial Technology)  
Seong Hyeon Kim (Korea Institute of Industrial Technology)  
Jae Hoon Ahn (Yonsei University)  
Hyeong Gu Kim (Korea Institute of Industrial Technology)  
Byung-Kwon Min (Yonsei University)

**POSTER 1**

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- PP1-064** A490 **Investigation of Agitation Effects in Dry Electrochemical Polishing via Machining Characterization Using a Single Solid Electrolyte Particle**  
Seong Ung Kwak (Chosun University)  
Jeong Woo Park (Chosun University)  
Uk Su Kim (Chosun University)
- PP1-065** A499 **Fabrication of Vitreous Carbon Mold for Chalcogenide Wafer Scale Lens Array**  
Young Kyu Kim (Chung-Ang University)  
Seok-min Kim (Chung-Ang University)  
Muzahir Ali (Chung-Ang University)  
Seongmin Lee (Chung-Ang University)  
Hongmin Kim (Goodpnc Co., Ltd.)  
Su-ho Ahn (Goodpnc Co., Ltd.)
- PP1-066** A500 **Surface Roughness of High-hardness Mold Material according to Cutting Conditions**  
Jong Su Kim (Korea Institute of Industrial Technology)  
Hyeon Hwa Lee (Korea Institute of Industrial Technology)  
Jin Soo Kim (Korea Institute of Industrial Technology)  
Dong Won Lee (Korea Institute of Industrial Technology)  
Jung Eon Soun (Korea Institute of Industrial Technology)  
Min Kyu Son (Korea Institute of Industrial Technology)
- PP1-067** A501 **Cutting Characteristics of Composite Material by PCD Tool Geometry and Cutting Condition**  
Yeonoh Kim (Daegu Mechatronics and Materials Institute)  
Dong-Gyu Kim (Daegu Mechatronics and Materials Institute)
- PP1-068** A503 **Prediction of Flange Deflection during the Welding Process in Manufacturing Wind Turbine Towers**  
Myeongryun Seong (POSTECH)  
Anna Lee (POSTECH)  
Yonggyu Park (SeAH Wind Ltd.)  
Donggyun Kang (SeAH Wind Ltd.)
- PP1-069** A506 **Modified K-factor Model on Large Scale Roll Bending Process for Offshore Wind Turbine Substructures**  
Kanghyun Ki (POSTECH)  
Anna Lee (POSTECH)  
Junsik Kim (POSTECH)  
Yonggyu Park (SeAH Wind Ltd.)  
Donggyun Kang (SeAH Wind Ltd.)

- PP1-070** A554 **A Case Study on Natural Language Processing-based Unstructured Data Analysis in Automotive Parts Industry**  
Min Jae Ko (Korea Institute of Industrial Technology)  
Yong Ju Cho (Korea Institute of Industrial Technology)
- PP1-071** A592 **Additive Manufacturing and Connectivity Test of Interlocking Struct Additive Manu**  
Hak-Sung Lee (Dong-A University)  
Ye-Rim Kim (Korea Institute of Materials Science)  
Jong Bae Jeon (Dong-A University)
- PP1-072** A648 **Analysis of the Changes in the Internal Stresses in a Steel Plate during the Mechanical Cutting Process**  
Sungmin Joo (Chosun University)  
Younggon Kim (Korea Institute of Industrial Technology)  
Jeonghun Go (Chosun University)  
Kwangsoo Park (Research Institute of Industrial Science and Technology)

## 2. Machine Tools & Systems

- PP2-001** A012 **Development of a General System Structure for the CNC Controller of Parallel Kinematic Machine Tools**  
Syh-Shiuh Yeh (National Taipei University of Technology)  
Zheng-Huai Huang (National Taipei University of Technology)  
Ming-Han You (National Taipei University of Technology)
- PP2-002** A017 **Data-driven Transient Temperature Field Prediction Modelling and Generalization of Motorized Spindles based on Thermal Network**  
Yun Yang (Shanghai Jiao Tong University)  
Zhengchun Du (Shanghai Jiao Tong University)  
Jun Lv (Genertec Machine Tool Engineering Research Institute Co., Ltd.)  
Xiaobing Feng (Shanghai Jiao Tong University)
- PP2-003** A137 **Simulation of Machining of Aerospace Parts based on Digital Twin through Prediction of Cutting Force and Tool Wear**  
Sangmin Yang (UNIST)  
Hyungwook Park (UNIST)  
Dongmin Kim (Korea Institute of Industrial Technology)  
Junyoung Kim (Gyeongsang National University)

**POSTER 1**

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- PP2-004 A145**    **Characteristics and Grinding Performance of Ultrafine Bubble Coolant**  
Yosuke Hatayama (Tohoku University)  
Hiromu Okoshi (Tohoku University)  
Terumi Mori (KYB Corporation)  
Futoshi Yoshida (KYB Corporation)  
Tsunemoto Kuriyagawa (Tohoku University)  
Masayoshi Mizutani (Tohoku University)
- PP2-005 A146**    **Real-time Vibration Measurement in Cutting Process Using a Piezoelectric Sensor-based Tool Holder and Wireless Signal Transmission Spindle**  
Chien Hung Liu (National Chung Hsing University)
- PP2-006 A149**    **Development of a Mobile Platform Capable of Measuring and Processing**  
Sungcheul Lee (Korea Institute of Machinery and Materials)  
Yongjin Kim (Korea Institute of Machinery and Materials)  
Byung-Sub Kim (Korea Institute of Machinery and Materials)  
Hyun-Su Kim (Korea Institute of Machinery and Materials)  
Dong-Hoon Kim (Korea Institute of Machinery and Materials)  
Seung-Kook Ro (Korea Institute of Machinery and Materials)
- PP2-007 A150**    **Rapid Cycle Time Estimation of CNC Machine Tool Interpolator**  
Chan-Young Lee (Korea Institute of Machinery and Materials)  
Seung Kook Ro (Korea Institute of Machinery and Materials)  
Chang Kyu Song (Korea Institute of Machinery and Materials)  
Jeong Seok Oh (Korea Institute of Machinery and Materials)
- PP2-008 A157**    **Analysis of Vibration Reduction Characteristics of Workpiece Holders for Ultra-precision Machining**  
Yoonah Park (Korea Institute of Industrial Technology)  
Hakjun Lee (Korea Institute of Industrial Technology)  
Jeonghwan Yun (Tech University of Korea)  
Jeawook Mun (Korea Institute of Industrial Technology)
- PP2-009 A164**    **A Study on the Energy Consumption and Machining Signal Behavior of Machine Tools**  
Jaehyeok Kim (Korea Institute of Industrial Technology)  
Jaejun Lee (Korea Institute of Industrial Technology)  
Jaehak Lee (Korea Institute of Industrial Technology)  
Youngjae Choi (Korea Institute of Industrial Technology)

- PP2-010 A194 Vision-based Monitoring Framework for Human-robot Collaborative Assembly using Heterogeneous Cobots**  
Yee Yeng Liao (Pusan National University)  
Kwangyeol Ryu (Pusan National University)
- PP2-011 A198 Thermal Error Estimation for a CFRP Machine Tool due to Spindle Rotation and Environmental Temperature Fluctuations**  
Aoi Suzuki (Keio University)  
Yasuhiro Kakinuma (Keio University)  
Makoto Kato (Keio University)
- PP2-012 A213 Vibration Modeling and Analysis of a Permanent Magnet Synchronous Motor for Fault Diagnosis**  
Hyunseung Lee (Hanyang University)  
Ki-Yong Oh (Hanyang University)  
Seho Son (Hanyang University)  
Dayeon Jeong (Hanyang University)  
Kyung Ho Sun (Korea Institute of Machinery and Materials)
- PP2-013 A218 Study of Characteristics of Vibration and Acoustic Data on Surface Roughness Using FFT Analysis during Milling with Worn End Mill Tool**  
Eunyeong Seong (Korea Institute of Industrial Technology)  
Hye-jin Lee (Korea Institute of Industrial Technology)  
Chanhee Won (Korea Institute of Industrial Technology)
- PP2-014 A229 The Damage Simulation in Ultrasonic Assisted Drilling on Silicon Wafer with Vibration Amplitude Variation**  
Rendi Kurniawan (Yeungnam University)  
Taejo Ko (Yeungnam University)  
Moran Xu (Yeungnam University)  
Shuo Chen (Yeungnam University)  
Yein Kwak (Yeungnam University)  
Pilwan Han (Korea Electrotechnology Research Institute)
- PP2-015 A274 Structural Analysis of ICT Based Servo System Type Surface Grinder Bed and Saddle**  
Hyunsu Kim (Changwon National University)  
Wonjee Chung (Changwon National University)  
Minseong Park (Changwon National University)  
Eunjung Kim (Changwon National University)  
Bogyeong Jeong (Changwon National University)  
Daekyun Ahn (Daeshin Engineering)  
Hongrae Park (Keimyung University)

**POSTER 1**

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- PP2-016 A332 A Study on Rotational FRF Estimation Using Curve Fitting for RCSA**  
Ji-Wook Kim (Korea Institute of Industrial Technology)  
Jinseok Jang (Korea Institute of Industrial Technology)  
Hyejin Song (Korea Institute of Industrial Technology)  
Yong-Jae Cho (Korea Institute of Industrial Technology)  
Chang-Young Choi (Korea Institute of Industrial Technology)  
Yu Hyun Jung (Korea Institute of Industrial Technology)  
Soobin Han (Korea Institute of Industrial Technology)  
Jin Su Ha (Korea Institute of Industrial Technology)  
Sang Wook Park (Korea Institute of Industrial Technology)  
Jeong In Lee (Korea Institute of Industrial Technology)  
Jeong Gon Kim (Korea Institute of Industrial Technology)
- PP2-017 A346 Iterative Learning Control with Data-driven Inversion for Precision Machines**  
Chang Kyu Song (Korea Institute of Machinery and Materials)  
Seung Guk Baek (Korea Institute of Machinery and Materials)  
Seung Kook Ro (Korea Institute of Machinery and Materials)  
Chang-Ju Kim (Korea Institute of Machinery and Materials)  
Ja Choon Koo (Sungkyunkwan University)
- PP2-018 A353 Selection of Key Temperature Measurement Points for Thermal Error Modeling of Three-axis Machine Tools**  
Gyungho Khim (Korea Institute of Machinery and Materials)  
Lei Cao (Korea Institute of Machinery and Materials)  
Jeong Seok Oh (Korea Institute of Machinery and Materials)  
Seung-Kook Ro (Korea Institute of Machinery and Materials)  
Chang Kyu Song (Korea Institute of Machinery and Materials)
- PP2-019 A380 Enhancing Post-CMP Cleaning Efficiency through Comparative Evaluation of PVA Brush Cleaning Methods**  
Doyeon Kim (Korea Institute of Industrial Technology)  
Hyoungjae Kim (Korea Institute of Industrial Technology)  
Hanchul Cho (Korea Institute of Industrial Technology)  
Tae Kyung Lee (Korea Institute of Industrial Technology)
- PP2-020 A423 Quality Monitoring Indicator based on Machine Learning in CNC Machining Process**  
Jaeuk Choi (Chungnam National University)  
Seung Hwan Park (Chungnam National University)  
Peng Liu (Chungnam National University)

- PP2-021 A465** **Influence of Laser Parameters on Laser Micromachining of Silicon Wafer**  
Jae Gyeong Kim (Korea Institute of Industrial Technology)  
Jeonghong Ha (Korea Institute of Industrial Technology)  
Jong Wan Ko (Korea Institute of Industrial Technology)
- PP2-022 A466** **Development of Mixed-reality Based Monitoring and Control Methodologies for Human Robot Collaboration Systems**  
Siku Kim (Pusan National University)  
Kwangyeol Ryu (Pusan National University)
- PP2-023 A479** **The Effect of Actuator Position to Parasitic Motion of Flexure-based Tip-tilt-piston Stage**  
Hyeun Yun (Seoul National University of Science and Technology)  
Dahoon Ahn (Seoul National University of Science and Technology)  
Hak-Jun Lee (Korea Institute of Industrial Technology)  
Hojin Lee (Soongsil University)
- PP2-024 A504** **Estimation of Tool Wear and Process Optimization Using Vision Image of the Machined Product**  
Jaehak Lee (Korea Institute of Industrial Technology)  
Jaejun Lee (Korea Institute of Industrial Technology)  
Eunseok Nam (Korea Institute of Industrial Technology)
- PP2-025 A514** **Autoencoder-based Tool Failure Diagnosis and Prediction in Cryogenic Milling of Ti-6Al-4V Titanium Alloy**  
Jae Gyeong Choi (UNIST)  
Sunghoon Lim (UNIST)  
Dongchan Kim (UNIST)  
Dongmin Kim (Korea Institute of Industrial Technology)  
Hyung Wook Park (UNIST)
- PP2-026 A516** **Cycle Time Prediction for 5-axis CNC Machine Using Tool Path Generation Model**  
Joon-Soo Lee (Yonsei University)  
Byung-Kwon Min (Yonsei University)  
Chan-Young Lee (Korea Institute of Machinery and Materials)  
Soon-Hong Hwang (Yonsei University)
- PP2-027 A517** **Dynamics Model Parameter Identification of Robot Manipulator Using Least Squares and Gradient Descent**  
Jong-Min Lim (Yonsei University)  
Byung-Kwon Min (Yonsei University)  
Joon-Soo Lee (Yonsei University)  
Ju-Hyeong Lee (Yonsei University)

**POSTER 1**

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- PP2-028 A518**    **CFD Simulations of Flow Inside a Cylindrical Roller Bearing for Drag Coefficient of Roller**  
Shinhyang Park (Kumoh National Institute of Technology)  
Dongjoo Kim (Kumoh National Institute of Technology)  
Hyoeyun Lee (Kumoh National Institute of Technology)  
Jihyun Do (Kumoh National Institute of Technology)
- PP2-029 A519**    **Remaining Useful Life Prediction of Ball Screw Using Transfer Learning**  
In-Wook Oh (Yonsei University)  
Byung-Kwon Min (Yonsei University)  
Wontaek Song (Yonsei University)  
Soon-Hong Hwang (Yonsei University)
- PP2-030 A521**    **Reinforcement Learning Based Corner Smoothing with Kinematic Constraints**  
Sangwon Kang (Yonsei University)  
Byung-Kwon Min (Yonsei University)  
Soon-Hong Hwang (Yonsei University)  
Joon-Soo Lee (Yonsei University)
- PP2-031 A542**    **Enhancing the Computational Efficiency of Predicting the Trajectory Error of Machine Tool Feed Drive**  
Soon-Hong Hwang (Yonsei University)  
Byung-Kwon Min (Yonsei University)  
Chan-Young Lee (Korea Institute of Machinery and Materials)
- PP2-032 A551**    **Development of Virtual Machine Tool System for Machining Process Monitoring and Part Program Optimization**  
Chang-Ju Kim (Korea Institute of Machinery and Materials)  
Segon Heo (Korea Institute of Machinery and Materials)  
Chan-Young Lee (Korea Institute of Machinery and Materials)  
Jeong Seok Oh (Korea Institute of Machinery and Materials)
- PP2-033 A555**    **Dynamic Analysis of Rotor-bearing Systems with Temperature and Fitting Changes under Operating Conditions**  
Gilbert Rivera (Kumoh National Institute of Technology)  
Seong-Wook Hong (Kumoh National Institute of Technology)  
Shinhyang Park (Kumoh National Institute of Technology)  
Chansik Kang (VNC Technologies)  
Dongjoo Kim (Kumoh National Institute of Technology)

- PP2-034** A560 **Study on the Diametral Clearance in Cylindrical Roller Bearings under Operating Conditions**  
Jinhyeok Sa (Kumoh National Institute of Technology)  
Seong-Wook Hong (Kumoh National Institute of Technology)  
Gilbert Rivera (Kumoh National Institute of Technology)
- PP2-035** A562 **Prediction of Tool Wear by Multi-sensor Signals and Surface Roughness of Workpiece in Face Milling**  
Jedoo Ryu (Korea Institute of Industrial Technology)  
Sung Ryul Kim (Korea Institute of Industrial Technology)  
Kyung Hwan Hwang (Korea Institute of Industrial Technology)  
Min Cheol Lee (Pusan National University)
- PP2-036** A577 **Analysis on the Load Characteristics of Water Hydrostatic Bearings considering the Turbulent Flow in the Capillary Compensator**  
Hyun Soo Kim (Korea Institute of Machinery and Materials)  
Chun-Hong Park (Korea Institute of Machinery and Materials)  
Gyung Ho Khim (Korea Institute of Machinery and Materials)  
Jong Yup Shim (Korea Institute of Machinery and Materials)
- PP2-037** A601 **A Study on Data Generation Framework based on Conditional Generative Adversarial Network (CGAN) for Bearing Fault Diagnosis**  
Kyumin Kim (Sungkyunkwan University)  
Sang Won Lee (Sungkyunkwan University)  
Yongjae Jeon (Sungkyunkwan University)  
Byeong Kwon Kang (Sungkyunkwan University)  
Yelim Lee (Sungkyunkwan University)
- PP2-038** A609 **Development of an Ensembled Convolutional Neural Network Algorithm for Machine Tool Chatter Detection**  
Jun Kim (Korea Institute of Industrial Technology)  
Eun Seok Nam (Korea Institute of Industrial Technology)  
Bo Hyun Kim (Korea Institute of Industrial Technology)  
Young Jae Choi (Korea Institute of Industrial Technology)  
Jin Seok Kim (Korea Institute of Industrial Technology)  
Kang Eun Kim (Korea Institute of Industrial Technology)

POSTER 2

**July 18** (Tue) 15:25-16:15

Ocean Hall

**3. Automation, Measurement & Control**

- PP3-001 A016 The Design of Error-based Adaptive Robust RBF Neural Network Intelligent PID Controller for Application to 2-DOF Snake Robot's Head**  
Sung Jae Kim (Pukyong National University)  
Jin Ho Suh (Pukyong National University)  
Dong Gwon Shin (Korea Institute of Robotics and Technology Convergence)  
Ju Hyun Pyo (Korea Institute of Robotics and Technology Convergence)  
Maolin Jin (Korea Institute of Robotics and Technology Convergence)
- PP3-002 A021 Defect Detection Method based on Deep Learning and Generative Adversarial Network**  
Zhilin Zeng (Shanghai Jiao Tong University)  
Zhengchun Du (Shanghai Jiao Tong University)  
Hao Qu (Shanghai Jiao Tong University)  
Jun Lv (Genertec Machine Tool Engineering Research Institute Co., Ltd.)
- PP3-003 A030 High-resolution Optical Sectioning Structured Illumination Microscopy**  
Jong-Kyu Park (Chosun University)  
Ki-Nam Joo (Chosun University)
- PP3-004 A031 Dynamic Interferometry for In-line 3D Inspection of Stacked Semiconductor Devices**  
Young-Sik Ghim (Korea Research Institute of Standards and Science)  
Hyug-Gyo Rhee (Korea Research Institute of Standards and Science)
- PP3-005 A040 A Study of Magnetorheological Fluid Sedimentation Considering Various Experimental Parameters**  
Elliza Tri Maharani (Kongju National University)  
Jong-Seok Oh (Kongju National University)  
Myeong-Won Seo (Kongju National University)  
Yoon-Mok Kim (Kongju National University)  
Seung-Bok Choi (The State University of New York, Korea)

- PP3-006 A042 PM-driven Back-EMF-based Sensorless Soft Landing Control of Electromagnetic Binary Actuator**  
Jeong Min Park (Yonsei University)  
Jun Young Yoon (Yonsei University)  
Jae Woo Jung (Yonsei University)  
Eun Kyu Kim (Yonsei University)  
Hyeong Min Yoon (Yonsei University)  
Jong Min Sung (Yonsei University)
- PP3-007 A051 Trajectory Generation Method of 2-DOF Magnetic Levitator for Near-zero-power High-throughput Non-contact Transportation**  
Eun Kyu Kim (Yonsei University)  
Jun Young Yoon (Yonsei University)  
Jae Woo Jung (Yonsei University)  
Hyeong Min Yoon (Yonsei University)
- PP3-008 A052 Simulation Based Tuning Methodology of PID Controller Parameters Using Reinforcement Learning**  
Yonseok Kim (Korea Institute of Industrial Technology)  
Young Jun Yoo (Korea Institute of Industrial Technology)  
Youngjoo Hyun (Korea Institute of Industrial Technology)  
Taeheon Lee (Korea Institute of Industrial Technology)  
Byeong Ju Lim (Korea Institute of Industrial Technology)
- PP3-009 A053 Working Order Check Process Using Video Classification of a Manual Assembly Line**  
Seyun Jeong (Korea Institute of Industrial Technology)  
Young Jun Yoo (Korea Institute of Industrial Technology)  
Byeong Ju Lim (Korea Institute of Industrial Technology)  
Hakju Kang (UlalaLAB. INC.)  
Sang Hun Lee (UlalaLAB. INC.)
- PP3-010 A055 Multi-purpose Temperature Control of a Chamber for Ultra-precision Machines Using Deep Reinforcement Learning**  
Byung-Sub Kim (Korea Institute of Machinery and Materials)  
Seung-Kook Ro (Korea Institute of Machinery and Materials)

## **POSTER 2**

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- PP3-011 A060 Position Tracking Performance Enhancement of Reluctance-force-type Magnetic Levitator Module with Nonlinearity Compensation**  
Hyeong Min Yoon (Yonsei University)  
Jun Young Yoon (Yonsei University)  
Eun Kyu Kim (Yonsei University)  
Jae Woo Jung (Yonsei University)  
Jeong Min Park (Yonsei University)  
Jong Min Sung (Yonsei University)
- PP3-012 A065 Automation of Manufacturing Equipment Arrangement including Robotic Arm Using Bayesian Optimization**  
Su-Young Park (Seoul National University)  
Sung-Hoon Ahn (Seoul National University)  
Hyungjung Kim (Seoul National University)
- PP3-013 A070 Design, Construction, and Experiments of Acoustic Position Encoder for Multi-actuator Systems**  
Bo Min Kang (Yonsei University)  
Jun Young Yoon (Yonsei University)  
Hyo Geon Lee (Yonsei University)  
Yoon Sik Kwon (Yonsei University)
- PP3-014 A081 Automated Detection and Removal System of Foreign Objects in Tire**  
Sae Jin Park (Seoul National University)  
Sung-Hoon Ahn (Seoul National University)  
Su-Young Park (Seoul National University)  
Dohyeon Kim (Seoul National University)
- PP3-015 A101 A Study on the Method for Predicting Drive Bearing Wear of Gantry Robot Using Transfer Learning**  
Jeonghyeon Park (Inje University)  
Kwangsuck Boo (Inje University)  
Jae Ho Oh (SP Systems Co., Ltd.)
- PP3-016 A102 Development and Evaluation of a State-variable Filter for Low Frequency Compensation of Geophone Sensor in Active Vibration Isolation System**  
Hyo-Young Kim (Tech University of Korea)  
Jinsu Choi (KAIST)  
Kihyun Kim (Tech University of Korea)

- PP3-017** A104 **Comparative Study on Actuator Combinations of Path Tracking Control for Autonomous Vehicles**  
Jinwoo Kim (Seoul National University of Science and Technology)  
Seongjin Yim (Seoul National University of Science and Technology)
- PP3-018** A110 **Multiplexed Optical Spectrometer with High Resolution in the Wide Spectral Range**  
Jin Hee Cho (Chosun University)  
Ki-Nam Joo (Chosun University)
- PP3-019** A113 **Enhancing the Object Detection Quality of the Monitoring System Mounted on CDPR**  
Hyungjoo Park (Korea Electronics-Machinery Convergence Technology Institute)  
Dongyoung Jang (Korea Electronics-Machinery Convergence Technology Institute)  
Youngha Shin (Korea Electronics-Machinery Convergence Technology Institute)  
Jungnam Park (Korea Electronics-Machinery Convergence Technology Institute)  
Hohwan Jung (Korea East-West Power Co., Ltd.)  
Hanseo Lim (Suffield Academy)
- PP3-020** A114 **Polarized Dual Low-coherence Scanning Interferometry Using a Polarization Camera and the Dual Low Coherence Characteristics**  
Seonile Seo (Chosun University)  
Ki-Nam Joo (Chosun University)  
Seongwook Jang (Chosun University)
- PP3-021** A123 **A Study on the Reception Characteristics of an Ultrasonic Sensor Installed in Chamber with Micro-leakage**  
Wonjun Seo (Chungnam National University)  
Seokyeon Im (Chungnam National University)  
Hyerim Ryu (Chungnam National University)  
Dongho Yu (Chungnam National University)  
Insun Kang (Chungnam National University)  
Beomseok Oh (Seoul National University of Science and Technology)  
Sunjin Yu (Changwon National University)
- PP3-022** A144 **Characterization of Polarization Structured Illumination Microscopy**  
Minseo Cho (Chosun University)  
Ki-Nam Joo (Chosun University)

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- PP3-023** A191 **Automatic Assembly of MEMS Probes for Semiconductor Inspection**  
Kee-Bong Choi (Korea Institute of Machinery and Materials)  
Won-Sup Lee (Korea Institute of Machinery and Materials)  
Hyeong Jun Lim (Korea Institute of Machinery and Materials)  
Geehong Kim (Korea Institute of Machinery and Materials)  
Junhyoung Ahn (Korea Institute of Machinery and Materials)  
Jaejong Lee (Korea Institute of Machinery and Materials)
- PP3-024** A215 **Development of Feasibility Test-bed for Evaluating Smart Sensors in Warm Forming with Elevated Aluminum Sheet**  
Chanhee Won (Korea Institute of Industrial Technology)  
Hye-Jin Lee (Korea Institute of Industrial Technology)
- PP3-025** A220 **Performance Evaluation of Data-driven Method and Model-based Method for 4 Wheel Independent Steering Vehicle State Estimation**  
Gyu-Yong Hwang (Kongju National University)  
Jong-Seok Oh (Kongju National University)  
Elliza Tri Maharani (Kongju National University)  
Min-Sang Seong (Hyundai Motor Company)  
Chul-Hee Han (Hyundai Motor Company)
- PP3-026** A225 **Control of Ride Comfort and Wheel Motion of In-wheel Motor Vehicles Using Road Type Classification and Control Logics**  
Young-Jun Kim (Kongju National University)  
Jong-Seok Oh (Kongju National University)  
Young-Il Sohn (Hyundai Motor Company)  
Se-Hyun Chang (Hyundai Motor Company)  
Seung-Bok Choi (The State University of New York, Korea)
- PP3-027** A351 **Development of Lumped Parameter Tire Model for Mobile Robot**  
Ji Su Jeong (Pukyong National University)  
Jeong Hyun Sohn (Pukyong National University)
- PP3-028** A405 **Analysis of Geometry and Operating Variables on Vortex Tube Performance Using Explainable Machine Learning**  
Hyo Beom Heo (Chungnam National University)  
Seung Hwan Park (Chungnam National University)  
Jun Ho Lee (Chungnam National University)
- PP3-029** A444 **Design and Basic Evaluation for Wafer TTV Measurement**  
Anmok Jeong (Korea Institute of Industrial Technology)  
Hakjun Lee (Korea Institute of Industrial Technology)

- PP3-030 A561** **Location Estimation Using Two-step Point Matching in Outdoor Self-driving Robot based on Point Cloud Map of 3D LiDAR**  
Jae-Hun Jang (Pukyong National University)  
KyungChang Lee (Pukyong National University)  
Ji-Hwan Kim (Pukyong National University)
- PP3-031 A563** **Analysis of Seawater Secondary Battereis Characteristics considering Temperature Variations**  
Hyunjun Jang (Pukyong National University)  
Kyung-Chang Lee (Pukyong National University)  
Hyeong Jun Kim (Gyeongsang National University)
- PP3-032 A569** **Detection of Net Damage in Sea Cage Aquaculture Using Image Processing with Mesh-hole Grouping**  
Jung-Ho Kang (Pukyong National University)  
Kyung-Chang Lee (Pukyong National University)  
Uk-Jin Baek (Pukyong National University)  
Tatiana Keruzel (Pukyong National University)
- PP3-033 A570** **Robotic Arm Pushing and Grasping based on Deep Reinforcement Learning for Bin-picking**  
Da-Ryeong Woo (Pukyong National University)  
KyungChang Lee (Pukyong National University)  
Jung-Ho Kang (Pukyong National University)
- PP3-034 A571** **Recognition of Dead Fish Using StrongSORT Multi-object Tracking Algorithm in Sea Cage Aquaculture**  
Tatiana Keruzel (Pukyong National University)  
Kyung-Chang Lee (Pukyong National University)  
Jung-Ho Kang (Pukyong National University)
- PP3-035 A607** **Non-destructive Flexural Strength Evaluation of Permeable concrete Blocks Using Surface Images**  
Sangbeom Jo (Seoul National University)  
Younghwan Son (Seoul National University)  
Dognggeun Kim (Kyoto University)  
Jihun Jeon (Seoul National University)  
Taejin Kim (Seoul National University)

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- PP4-001 A006**    **Compression Test and Numerical Analysis of TBM Thrust Jack under Inclined Loading Condition**  
Mun-Gyu Kim (Korea Institute of Industrial Technology)  
Jung-Woo Cho (Korea Institute of Industrial Technology)  
Han-Young Jeong (Korea Institute of Industrial Technology)  
Joo-Young Oh (Korea Institute of Industrial Technology)  
Min-Gi Cho (Korea Institute of Industrial Technology)  
Hyun-Jun Park (Korea Institute of Industrial Technology)
- PP4-002 A011**    **Bio Inspired Suction Cup Gripper Specialized for Gripping Flat and Brittle Objects**  
Ginwoo Pyo (Kangwon National University)  
Yong-Jai Park (Kangwon National University)
- PP4-003 A020**    **Good Strength-ductility Synergy in Graphene Oxide Reinforced Aluminum Composite Fabricated by FSP: Microstructure and Mechanical Properties**  
Han-Gyeol Yoo (Korea Atomic Energy Research Institute)  
Hoon-Hwe Cho (Hanbat National University)  
Soumyabrata Basak (University of Ulsan)  
Mounarik Mondal (Kongju National University)  
SamYaw Anaman (Hanbat National University)  
Puspendu Guha (Korea Institute of Science and Technology)  
Eun-Joo Shin (Korea Atomic Energy Research Institute)  
Deok-Hwang Kwon (Korea Institute of Science and Technology)  
Sung-Tae Hong (University of Ulsan)
- PP4-004 A026**    **Research on Infrared Ray Heating Technology for Hot Stamping Process in Car Body Industry**  
Jeongsik Lim (Gyeongbuk Technopark)  
Seunghoon Cha (Gyeongbuk Technopark)  
Changrin Lee (Altec Co., Ltd.)  
Juntae Park (Altec Co., Ltd.)  
Taehoon Kim (Altec Co., Ltd.)  
Donggwon Kim (Shinyoung Co., Ltd.)
- PP4-005 A045**    **Heat-sealable PVA/CNC-based Nanocomposites for Active Food Packaging Applications**  
Bong-Kee Lee (Chonnam National University)  
Son Van Nguyen (Le Quy Don Technical University)  
Trieu Khoa Nguyen (Industrial University of Ho Chi Minh City)

- PP4-006 A049 NDE Techniques on Fiber Characterization in Spar Caps of Wind Turbine Blades Using Ultrasonic Waves**  
Kwang-Hee Im (Woosuk University)  
Sun-Kyu Kim (Chonbuk National University)  
Young-Tae Cho (Jeonju University)  
Yong-Deuck Woo (Woosuk University)  
Gui-Lin Zhang (Woosuk University)  
Xiaolong Shi (Woosuk University)  
Hua Liang (Woosuk University)  
Ziheng Zhou (Woosuk University)
- PP4-007 A069 Magnetic Field Analysis for 6-DOF Screw-motioned Permanent Magnet Synchronous Motor by 3-D Cylindrical Layer Model**  
Sang Won Jung (Yonsei University)  
Jun Young Yoon (Yonsei University)  
Jae Hyun Kim (Yonsei University)  
Jaehong Min (Yonsei University)  
Hyeong Min Yoon (Yonsei University)  
Yoon Sik Kwon (Yonsei University)  
Wontaek Song (Yonsei University)
- PP4-008 A072 Quasi-3D Analytical Modeling Method for On-load Slotless Axial-flux Permanent Magnet Machine**  
Sangmin Lee (Yonsei University)  
Jun Young Yoon (Yonsei University)  
Yoon Sik Kwon (Yonsei University)  
Bo Min Kang (Yonsei University)  
Jae Hyun Kim (Yonsei University)  
Jeong Min Park (Yonsei University)  
Jong Min Sung (Yonsei University)
- PP4-009 A087 Density Scaling of Strength and Stiffness of 3D Aperiodic Cellular Structures Formed by Bioinspired Rotational Stacking**  
Seo Rim Park (Changwon National University)  
Young Tae Cho (Changwon National University)  
Seok Kim (Changwon National University)
- PP4-010 A094 Design of a Release Mechanism to Handle Holding Force of Granular Materials in Jamming Gripper**  
Byeong Su Kwon (Kangwon National University)  
Yong-Jai Park (Kangwon National University)

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- PP4-011 A095 Development of Al-Si-Cu-Mg Alloy for Aluminum Die Casting with High Thermal Conductivity**  
Namseok Kim (Korea Institute of Industrial Technology)  
Youngok Yoon (Korea Institute of Industrial Technology)  
Kweonhoon Choi (Korea Institute of Industrial Technology)  
Seungyeon Yang (Korea Institute of Industrial Technology)  
Dongwoo Kang (Dongseo Machine & Tool Group)  
Soonil Kwon (Dongseo Machine & Tool Group)  
Seoungkyun Noh (Dongseo Machine & Tool Group)  
Museob Jeong (Dongseo Machine & Tool Group)  
Taehyun Kim (Dongseo Machine & Tool Group)  
Seongho Ha (Korea Institute of Industrial Technology)  
Bonghwan Kim (Korea Institute of Industrial Technology)  
Hyunkyuu Lim (Korea Institute of Industrial Technology)
- PP4-012 A097 Analytical Design of Pressure Transition Slot of Valve Plate for Axial Piston Pump**  
Yun-Joo Nam (Korea Institute of Industrial Technology)
- PP4-013 A103 Microstructural Characterization of FCD700 Cast Irons Containing Cu Content above the Solubility Limit Solidified at Different Cooling Rates**  
Sang-Yun Shin (SBB TECH Co., Ltd.)  
Dong-Hyuk Kim (Korea Institute of Industrial Technology)  
Jaegu Choi (Korea Institute of Industrial Technology)  
Seong-Ho Ha (Korea Institute of Industrial Technology)
- PP4-014 A115 Rapid Functionalization Process of Graphite Felt Electrode via Atmospheric Pressure Plasma Jet for Vanadium Redox Flow Batteries**  
Song-Yu Chen (National Taiwan University of Science and Technology)  
Yu-Lin Kuo (National Taiwan University of Science and Technology)  
Jhao-Yu Guo (National Taiwan University of Science and Technology)  
Chen-Hao Wang (National Taiwan University of Science and Technology)
- PP4-015 A116 Influence of The Plasma Process Parameters on the Microstructure, Hardening, and Wear Behavior of Cold Work Steel via Atmospheric Pressure Plasma Nitriding**  
Jhao-Yu Guo (National Taiwan University of Science and Technology)  
Yu-Lin Kuo (National Taiwan University of Science and Technology)  
Kun-Cheng Ke (National Taiwan Normal University)  
Song-Yu Chen (National Taiwan University of Science and Technology)  
Ming-Chun Tsai (National Taiwan University of Science and Technology)

- PP4-016** A119 **Mechanical Property Enhanced Ultra-high Molecular Weight Polypropylene by Compounding Modified Cellulose**  
Ji-Hong Bae (Pusan National University)
- PP4-017** A133 **Effect of Simultaneous Addition of Sn and Cu on Microstructure Formation of As-cast GCD700 Cast Irons**  
Jaegu Choi (Korea Institute of Industrial Technology)  
Donghyuk Kim (Korea Institute of Industrial Technology)  
Seong-Ho Ha (Korea Institute of Industrial Technology)  
Sang-Yun Shin (SBB TECH Co., Ltd.)
- PP4-018** A147 **Synthesis of MOF-derived Carbon (MDC) and its Application as a Cathode for Lithium-air Batteries**  
Dasom Jeong (Korea Institute of Industrial Technology)  
Jeasung Park (Korea Institute of Industrial Technology)  
Seong Cheon Kim (Korea Institute of Industrial Technology)  
Taeseop An (Korea Institute of Industrial Technology)  
Oh Kyung Kwon (Korea Institute of Industrial Technology)  
Hae Jin Hwang (Inha University)
- PP4-019** A148 **Method of Switching the Magnetic Circuit of a Permanent Magnet Wheel with Using AlNiCo Magnets**  
HyunSoo Kim (Korea Institute of Machinery and Materials)  
Sungcheul Lee (Korea Institute of Machinery and Materials)  
Seong Kook Ro (Korea Institute of Machinery and Materials)
- PP4-020** A161 **Effect of Trace Sn Addition on Microstructural Evolution and Cu Segregation in 800 MPa Grade Ductile Cast Iron Containing 3 mass%Cu during Solidification**  
Dong-Hyuk Kim (Korea Institute of Industrial Technology)  
Jaegu Choi (Korea Institute of Industrial Technology)  
Seong-Ho Ha (Korea Institute of Industrial Technology)  
Sang-Yun Shin (SBB TECH Co., Ltd.)
- PP4-021** A166 **Recent Trends in Lens Materials for Infrared Imaging**  
Yong Gyu Choi (Korea Aerospace University)  
Hyun Kim (Korea Aerospace University)  
Il Jung Yoon (Korea Aerospace University)
- PP4-022** A175 **High-performance Printed Electrode with Rapid Fabrication based on UV and IPL Light Processes without Thermal Treatment**  
Hyun Jin Nam (Korea Electronic Technology Institute)  
Se-Hoon Park (Korea Electronic Technology Institute)

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- PP4-023 A182 A Study on the Eco-friendly Flame Retardant Materials Output and Properties Using Pelletextruder 3D Printer**  
Jeongung Ha (Changwon National University)  
Jongkyu Park (Changwon National University)  
Hyunsu Jang (Changwon National University)  
Minsu Jung (Changwon National University)
- PP4-024 A210 Self-healing of Flax Fiber Composites with Core-shell Poly (Lactic) Acid Nanofibers as Healing Agent Carriers**  
Mohamad Tarmizie Hassim (Changwon National University)  
Jung-Il Song (Changwon National University)
- PP4-025 A219 Effect of Recycled PET Felt Fiber on Mechanical Properties of PP/PET Composites**  
Zolbayar Orkhonbaatar (Changwon National University)  
Jung-Il Song (Changwon National University)  
Dong Woo Lee (Changwon National University)
- PP4-026 A238 A Study on Simulation of Compressive Strength of 100 kN Class High Rigidity and Lightweight 48 V MHEV Battery Housing**  
Yongdae Kim (Korea Institute of Industrial Technology)
- PP4-027 A241 Combined Effect of Cu addition and Cooling Rate on Microstructure of As-cast Ferriticpearlitic Ductile Cast Irons**  
Seong-Ho Ha (Korea Institute of Industrial Technology)  
Jaegu Choi (Korea Institute of Industrial Technology)  
Dong-Hyuk Kim (Korea Institute of Industrial Technology)  
Sang-Yun Shin (SBB TECH Co., Ltd.)
- PP4-028 A252 Investigation of Mechanical Surface Treatment Effect on Improving Hydrogen Embrittlement of STS-316L**  
Seoung-Ho Baek (Pusan National University)  
Sang-Hu Park (Pusan National University)
- PP4-029 A258 Broadband Ventilated Noise Reduction Structure Inverse-design Using Deep Generative Model and Genetic Algorithm Optimization**  
Minwoo Cho (Pusan National University)  
Sang Min Park (Pusan National University)  
Seok Hyeon Hwang (Pusan National University)  
Kyungiun Song (Pusan National University)

- PP4-030 A263** **Analysis of Pressure and Performance Characteristics of Porous Air Bearing Applied to Friction Stir Welding Spindles**  
Jinwoo Kim (Changwon National University)  
Wonjee Chung (Changwon National University)  
Jisung Moon (Changwon National University)  
Seokhwan Kong (Changwon National University)  
Youngjun Song (Changwon National University)  
Hongrae Park (Keimyung University)
- PP4-031 A272** **Effect of Cu and Mg on Corrosion Resistance and Thermal Conductivity in Al-Si Alloys**  
Youngok Yoon (Korea Institute of Industrial Technology)  
Namseok Kim (Korea Institute of Industrial Technology)  
Kweonhoon Choi (Korea Institute of Industrial Technology)  
Seungyoon Yang (Korea Institute of Industrial Technology)  
Sejoon Hwang (NEDEC)  
Hangoo Kim (NEDEC)  
Seongwoo Kim (NEDEC)  
Suin Kim (HL Mando Corporation)  
Bonghwan Kim (Korea Institute of Industrial Technology)  
Seongho Ha (Korea Institute of Industrial Technology)  
Hyunkyu Lim (Korea Institute of Industrial Technology)  
Shae-Kwang Kim (Korea Institute of Industrial Technology)
- PP4-032 A273** **Early Detection of Metabolic Disorders Using N-rGO-ZnO Hollow Spheres NO<sub>2</sub> Breath Sensor**  
Arunkumar Shanmugasundaram (Chonnam National University)  
Dong-Weon Lee (Chonnam National University)
- PP4-033 A275** **Development of an Artificial Neural Network Prediction Model for Forming Process Design of an Intermediate Lever in Independent Suspension Systems for Large Commercial Vehicles**  
Jiwoo Park (Korea Institute of Industrial Technology)  
Minsu Kim (Korea Institute of Industrial Technology)
- PP4-034 A296** **Synthesis of Hollow Nanofibers Comprising Graphitic Carbon/Hollow Metal Oxide Nanospheres and Evaluation of Anodes for Lithium-ion Batteries**  
Jae Seob Lee (Chungbuk National University)  
Jung Sang Cho (Chungbuk National University)

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- PP4-035 A297** **Synthesis and Application of Metal Chalcogenide/C Composite Porous Microspheres Coated with N-doped C Layer as Sodium and Potassium Ion Batteries Anode Materials**  
KunWoo Baek (Chungbuk National University)  
Jung Sang Cho (Chungbuk National University)
- PP4-036 A299** **Synthesis of Porous Microsphere Comprising Titanium Dioxide and N-doped Graphitic Carbon and Application as Anode Material of Lithium-ion Battery**  
Hye Seon Ka (Chungbuk National University)  
Jung Sang Cho (Chungbuk National University)
- PP4-037 A302** **Synthesis and Application of Graphene Nanofibers Comprising Meso- and Micro-pores as Cathode for Li-Se Batteries**  
Hyunho Choi (Chungbuk National University)  
Jung Sang Cho (Chungbuk National University)
- PP4-038 A327** **Multi-physics Analysis of Rotor Bridge of a 10 kW Interior Permanent Magnet Synchronous Motor for Electric Podded Propulsor**  
Jang-Hyun Park (University of Science and Technology)  
Do-Kwan Hong (Korea Electrotechnology Research Institute)  
Yeon-Ho Jeong (Korea Electrotechnology Research Institute)
- PP4-039 A359** **Noise and PPTe Analysis of Multi-purpose Electric Utility System considering Parametric Study**  
Namyong Kim (Gyeongsang National University)  
Sung Ki Lyu (Gyeongsang National University)
- PP4-040 A367** **Tensile Deformation Behavior of New Al-6Mg Alloys in Cold-rolled and Annealed States as functions of Temperature and Strain Rate**  
Seung-Yoon Yang (Korea Institute of Industrial Technology)  
Bong-Hwan Kim (Korea Institute of Industrial Technology)  
Kweon-Hoon Choi (Korea Institute of Industrial Technology)  
Nam-Seok Kim (Korea Institute of Industrial Technology)  
Seong-Ho Ha (Korea Institute of Industrial Technology)  
Young-Ok Yoon (Korea Institute of Industrial Technology)  
Hyun-Kyu Lim (Korea Institute of Industrial Technology)  
Shae-Kwang Kim (Korea Institute of Industrial Technology)
- PP4-041 A375** **Bidirectional Auxetic Structures Using Nitinol Shape Memory Alloys sheet**  
Yeong Jae Park (Sungkyunkwan University)  
Hugo Rodrigue (Sungkyunkwan University)  
Hyunje Ahn (Sungkyunkwan University)

- PP4-042** A376 **A Study on Tensile Properties of Continuous Drying Process according to the Substrate Tension Distribution in the Roll-to-Roll System**  
Minho Jo (Konkuk University)  
Changwoo Lee (Konkuk University)  
Jaehyun Noh (Konkuk University)  
Sangbin Lee (Konkuk University)  
Minjae Kim (Konkuk University)
- PP4-043** A379 **Tool Breakage Mechanisms of a Tungsten Carbide Tool in End-milling of Titanium Alloy**  
Gi Dong Yang (Korea Institute of Industrial Technology)  
Kyung-Hee Park (Korea Institute of Industrial Technology)
- PP4-044** A388 **Analysis of Web Defect due to Strain Deviation in the Roll-to-Roll Manufacturing Systems**  
Jaehyun Noh (Konkuk University)  
Changwoo Lee (Konkuk University)  
Minho Jo (Konkuk University)  
Junyoung Yun (Konkuk University)  
Jeongdai Jo (Korea Institute of Machinery and Materials)
- PP4-045** A397 **Investigating the Stiffness Effect of Solid Electrolyte Interphase on Lithium Metal Dendrite Growth**  
Seong Soo Park (Chung-Ang University)  
Janghyuk Moon (Chung-Ang University)  
Jung Ho Kim (University of Wollongong)
- PP4-046** A402 **Numerical Study of the Effect of the Cooling Flow Condition on Gas Turbine Blade Life**  
Junseok Yoon (Korea Institute of Materials Science)  
Byunghui Kim (Changwon National University)  
Seokho Kim (Changwon National University)  
Indae Choi (Gyeonggi University of Science and Technology)

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- PP4-047 A407** **Investigating the Formation of Lithium Metallic Phase at Grain Boundaries in Lithium Lanthanum Titanium Oxide (LLTO) Solid Electrolyte Using First Principles Approach**  
Hyungjun Kim (Seoul National University)  
Suk Won Cha (Seoul National University)  
Patrick Conlin (University of Texas at Dallas)  
Matthew Bergschneider (University of Texas at Dallas)  
Noo Li Jeon (Seoul National University)  
Hayoung Chung (UNIST)  
Sung Youb Kim (UNIST)  
Maenghyo Cho (Seoul National University)  
Kyeongjae Cho (University of Texas at Dallas)
- PP4-048 A414** **Selective Heat Dissipation and Guidance by Island Structure BN (Boron Nitride)**  
Jae-Hun Yang (Sungkyunkwan University)  
Tae-II Kim (Sungkyunkwan University)
- PP4-049 A420** **Model-based System Engineering Approach for Predicting the State of Health of Electric Vehicle Batteries in Actual Driving Cycles**  
Donguk Ko (Chung-Ang University)  
Janghyuk Moon (Chung-Ang University)
- PP4-050 A421** **Coating Defect Detection of Roll-to-Roll Manufacturing System on Vision Image with Color Selection Method**  
Yoonjae Lee (Konkuk University)  
Changwoo Lee (Konkuk University)  
Haemi Lee (Konkuk University)  
Hojin Jeon (Konkuk University)
- PP4-051 A425** **High-thruput Computational Screening of Halide Solid Electrolyte for All-solid-state Lithium Batteries: With A-site Cation and Anion Exchange Analysis**  
Tham Thi Bui (Chung-Ang University)  
Janghuyk Moon (Chung-Ang University)
- PP4-052 A429** **A Comparative Study on the Passive Film Stability Formed by Nitric Acid Passivation on 304 and 316 Stainless Steel in Acid Solution**  
Seoyoun Kim (Korea Institute of Industrial Technology)  
Sekwon Oh (Korea Institute of Industrial Technology)  
Chanyoung Kim (Korea Institute of Industrial Technology)  
Jeongho Han (Hanyang University)

- PP4-053** A590 **Optimal Design of Surface Pressure Strength for Anti-fitting in 100 Nm-class Gearboxes**  
Gimyeong Gwak (Gyeongsang National University)  
Sung Ki Lyu (Gyeongsang National University)  
Jinuk Back (Gyeongsang National University)

## 7. New and Renewable Energy

- PP7-001** A010 **Electrochemical Performance of Electrospun Silicon Nanowires with Carbon Coating**  
Jong Dae Lee (Chungbuk National University)  
Dong Min Kim (Chungbuk National University)  
Jae Woong Youn (SK On)
- PP7-002** A058 **Development of Highly Efficient and Robust Production Technology for PEM Water Electro-catalysts Using Nanoscale Artificial Deformation**  
Hyunsu Kang (Korea Institute of Industrial Technology)  
Taeg Woo Lee (Korea Institute of Industrial Technology)  
Hee Chae Choi (Jiaotong-Liverpool University)  
Hyuk Su Han (Konkuk University)  
Hyung Giun Kim (Korea Institute of Industrial Technology)
- PP7-003** A092 **Performance Evaluation of Pack-bed Type Liquid Desiccant Dehumidifier according to Supply Air Conditions**  
Dong-Soon Jeon (Korea Institute of Industrial Technology)  
Ji-Woon Ko (Korea Institute of Industrial Technology)  
Kyung Jin Bae (Korea Institute of Industrial Technology)  
Oh Kyung Kwon (Korea Institute of Industrial Technology)
- PP7-004** A100 **Ammonia Gas Adsorption Test Using an In-situ Weighing Device inside a Reactor Chamber**  
Juheon Kim (Gyeongsang National University)  
Hyungmo Kim (Gyeongsang National University)  
Dhavalkumar N. Joshi (Gyeongsang National University)  
Duckjong Kim (Gyeongsang National University)

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- PP7-005 A112** **Triboelectric Nanogenerator for Improving Performance and Reducing Noise by Using a Conductive Porous Structure**  
Jaehee Shin (Korea University of Technology and Education)  
Jinhyoung Park (Korea University of Technology and Education)  
Doohyun Han (Korea University of Technology and Education)  
Hyunseo Park (Korea University of Technology and Education)  
Jeongmin Lee (Korea University of Technology and Education)
- PP7-006 A185** **A Study on the Internal Flow of Liquid Hydrogen Storage Tank according to the Anti-sloshing Device Using CFD**  
Hyunsoo Kim (Korea Institute of Industrial Technology)  
Sungwook Kang (Korea Institute of Industrial Technology)  
Mingoo Cho (Korea Institute of Industrial Technology)  
Changwook Ji (Korea Institute of Industrial Technology)  
Jaewoong Kim (Korea Institute of Industrial Technology)  
Changmin Pyo (Korea Institute of Industrial Technology)
- PP7-007 A207** **Influence of Multi-fry Biodiesel Blends on the Performance and Exhaust Emissions of a C.I Engine**  
Adhirath Mandal (Pai Chai University)  
Dowan Cha (Pai Chai University)
- PP7-008 A211** **Modeling of the Internal Shorts of High-capacity Battery under Compressive Loads based on Multiphysics Analysis**  
Sang-Youn Park (Korea University)  
Byoung-Ho Choi (Korea University)  
Jaeyoung Lim (Hyundai Motors Company)
- PP7-009 A244** **All-aerosol-sprayed High-performance Transparent Triboelectric Nanogenerator with Embedded Charge-storage Layer for Self-powered Invisible Security IoT System and Raindrop-solar Hybrid Energy Harvester**  
BaekGyu Kim (Pusan National University)  
Sang Min Park (Pusan National University)  
Jin Yeong Song (Pusan National University)  
Do Young Kim (Pusan National University)  
Min-cheol Kim (Pusan National University)  
Zong-Hong Lin (National Tsing Hua University)  
Dongwhi Choi (Kyung Hee University)
- PP7-010 A246** **Development of Process and Device for Biodiesel Conversion from Low-grade Oil**  
Jaehoon Cho (Korea Institute of Industrial Technology)  
Wooshik Shin (Korea Institute of Industrial Technology)  
Hong-shik Lee (Korea Institute of Industrial Technology)

- PP7-011 A250** **Combustion Characteristics of Vent Gas Generated during Thermal Runaway of Lithium-ion Batteries**  
Woogyung Kim (Hiroshima University)  
Akihiro Ueda (Hiroshima University)  
Keita Tanaka (Hiroshima University)  
Yangkyun Kim (Korea Institute of Civil Engineering and Building Technology)
- PP7-012 A284** **PEMFC Performance Assessment based on Bipolar Plate Materials Using Computational Techniques**  
Dawit Musse (Kongju National University)  
Dongkyoung Lee (Kongju National University)  
Seungeun Baek (Kongju National University)  
Seungjin Lee (Kongju National University)
- PP7-013 A292** **Effects of the Activation Voltage Range of Polymer Electrolyte Membrane Fuel Cells**  
Jung Soo Kim (Dankook University)  
Gu Young Cho (Dankook University)  
Ho Jun Yoo (Dankook University)  
Ji Woong Jeon (Dankook University)  
Dong Kun Song (Dankook University)  
Young Jo Lee (Dankook University)  
Seung Hyeok Hong (Dankook University)  
Ye Rim Kwon (Dankook University)  
Su Min Lee (Dankook University)  
Da Hye Geum (Dankook University)  
Ki Won Hong (Dankook University)
- PP7-014 A307** **Triboelectric Nanogenerator for Collecting Fine-dust from Multi-energy Source**  
Hyunseo Park (Korea University of Technology and Education)  
Jinhyoung Park (Korea University of Technology and Education)  
Jaehee Shin (Korea University of Technology and Education)  
Jungmin Lee (Korea University of Technology and Education)

**POSTER 2**

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- PP7-015 A363** **Effects of Mechanical Pressure on Electrochemical Characteristics of Membrane Electrode Assemblies of Polymer Electrolyte Membrane Fuel Cells**  
Ye Rim Kwon (Dankook University)  
Gu Young Cho (Dankook University)  
Dong Kun Song (Dankook University)  
Ho Jun Yoo (Dankook University)  
Jung Soo Kim (Dankook University)  
Young Jo Lee (Dankook University)  
Seung Hyeok Hong (Dankook University)  
Ji Woong Jeon (Dankook University)  
Da Hae Guem (Dankook University)  
Ki Won Hong (Dankook University)
- PP7-016 A418** **Triboelectric Energy Harvester with Triggering Mechanism for Consistent Output as Self-powered Humidity Sensor**  
Wondo Kim (Yonsei University)  
Jongbaeg Kim (Yonsei University)  
Hee-Jin Ko (Yonsei University)
- PP7-017 A470** **Self-powered Sensor based on Triboelectric Nanogenerator with Floating Cylindrical Structure for Wind Speed Detection**  
Jong-An Choi (Seoul National University of Science and Technology)  
Soonjae Pyo (Seoul National University of Science and Technology)  
Jingu Jeong (Seoul National University of Science and Technology)  
Mingyu Kang (Seoul National University of Science and Technology)
- PP7-018 A493** **Investigation of A-site Ordered Double Perovskite Oxides with Nanocatalyst Exsolution as Fuel Flexible Anode Materials for Solid Oxide Fuel Cells**  
In Won Choi (Seoul National University)  
Suk Won Cha (Seoul National University)  
Daniel Gil (Seoul National University)  
Inyoung Jeong (Seoul National University)  
Hyungjun Kim (Seoul National University)
- PP7-019 A558** **Controlling Particle Size of Sol-gel-based Bismuth Vanadium Oxide Film through Thermocompressive Process**  
Jihye Lee (Korea Institute of Machinery and Materials)  
Hanyi Lim (Korea Institute of Machinery and Materials)  
Hoyoung Lee (Korea Institute of Machinery and Materials)  
Jongbaeg Kim (Yonsei University)

- PP7-020** A603 **Use of CNT Sheet for Polymer Electrolyte Membrane Fuel Cells**  
Taehyun Park (Soongsil University)
- PP7-021** A605 **Bearing Capacity Analysis of Small Pile Foundations for Foundation Safety of Agricultural Photovoltaic Systems**  
Taejin Kim (Seoul National University)  
Younghwan Son (Seoul National University)  
Jihun Jeon (Seoul National University)  
Sangbeom Jo (Seoul National University)  
Donggeun Kim (Kyoto University)
- PP7-022** A614 **An Investigation of Electrochemical Impedance Spectroscopy regarding on Battery Series-/Parallel- Connections**  
Minho Yoon (Wonkwang University)  
Ikwhang Chang (Wonkwang University)  
Youngbeen Park (Wonkwang University)  
Sunghwan Choi (Wonkwang University)  
Uijung Jung (Wonkwang University)  
Jong Dae Baek (Yeungnam University)  
Chungyeon Cho (Wonkwang University)

## 8. Sustainable Technology

- PP8-001** A089 **Numerical Study of Fin-tube Heat Exchanger for Exhaust Gas Heat Recovery System**  
Kyung Jin Bae (Korea Institute of Industrial Technology)  
Oh Kyung Kwon (Korea Institute of Industrial Technology)
- PP8-002** A090 **Comparison of Heat Transfer Characteristics on Absorber Heat Transfer Tubes for Absorption Chillers**  
Ji-Woon Ko (Korea Institute of Industrial Technology)  
Oh Kyung Kwon (Korea Institute of Industrial Technology)  
Dong-Soon Jeon (Korea Institute of Industrial Technology)  
Kyung Jin Bae (Korea Institute of Industrial Technology)
- PP8-003** A091 **Performance Evaluation of Fin-tube Type Solid Desiccant Coated Heat Exchanger according to Dehumidification Conditions**  
Oh Kyung Kwon (Korea Institute of Industrial Technology)  
Kyung Jin Bae (Korea Institute of Industrial Technology)  
Jae Sung Park (Korea Institute of Industrial Technology)

**POSTER 2**

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- PP8-004 A109 Injection Characteristics of Liquid Carbon Dioxide as a Volatile Lubricant for Dry Sheet Metal Forming**  
Jin-Cheol Kim (University of Ulsan)  
Sung-Tae Hong (University of Ulsan)  
Lihong Cai (University of Ulsan)  
Meiling Geng (University of Ulsan)  
Seung-Bi Cha (University of Ulsan)  
Dong Kim (University of Ulsan)
- PP8-005 A127 A Study on Hybrid Acoustic Emission Diagnostic Technology for Refrigerant Leakage Detection**  
Hyeonsu Song (Changwon National University)  
Jaesun Lee (Changwon National University)  
Junpil Park (Changwon National University)  
Yeongil Choi (Changwon National University)
- PP8-006 A128 Deep Learning-based Defect Analysis Study of CRDM Nozzle Diagnosis Signal Using TOFD**  
Soomin Lee (Changwon National University)  
Jaesun Lee (Changwon National University)  
Junpil Park (Changwon National University)  
Hunhee Kim (Doosan Co., Ltd.)  
Jaeseok Park (Doosan Co., Ltd.)
- PP8-007 A192 Development of Fire Prevention Prediction Model for Nuclear Power Plant**  
Thien Khieu Ha (Chung-Ang University)  
Hong Sun Ryou (Chung-Ang University)  
Ji Tae Kim (Meteor Simulation)  
Dong Woo Kim (Chung-Ang University)  
Young Man Lee (Alllifelife Co., Ltd.)
- PP8-008 A197 Full Bio-based Epoxy Thermoset Derived from Vanillin Alcohol and Furfuryl Amine**  
Duc Hoa Pham (Inha University)  
Jaehwan Kim (Inha University)  
Bijender Kumar (Inha University)  
Giseok Park (Inha University)

- PP8-009** A208 **One-step Deposition of Metal Oxides Hybrid Photoanodes for Improved Photoelectrochemical Water Splitting**  
Muhammad Shehroze Malik (University of Ulsan)  
Doo-Man Chun (University of Ulsan)  
Deepto Roy (University of Ulsan)  
A. G. Abd-Elrahim (Assiut University)
- PP8-010** A497 **Development of NO<sub>2</sub>/SO<sub>2</sub> Gas Detection System Using UV-LED Light Source**  
Seongmin Lee (Chung-Ang University)  
Seok-min Kim (Chung-Ang University)  
Seongyong Byun (Chung-Ang University)  
Youngkyu Kim (Chung-Ang University)  
Horim Lee (GES Engineering)  
Ilhwa Park (GES Engineering)  
Yongwan Kim (GES Engineering)
- PP8-011** A604 **Calculation of LCA-based Carbon Emissions for Permeable Blocks Using Industrial by-products**  
Jihun Jeon (Seoul National University)  
Younghwan Son (Seoul National University)  
Taejin Kim (Seoul National University)  
Sangbeom Jo (Seoul National University)  
Donggeun Kim (Kyoto University)

### Special session- 3. Transfer Robot Fabrication and Control for Smart Farm and Smart Factory Applications

- SP3-001** A631 **Verifying and Controlling Multi-sensor Data Using a Web Service**  
Heon Uk Lee (Jimbo Robotics Inc.)  
Sang Cheol Lee (Daegu Gyeongbuk Institute of Science and Technology)
- SP3-002** A632 **The Modular Drive Platform for Transfer Robot of Smart Farm and Smart Factory**  
Hyun Kyu Lee (Pusan National University)  
Sang Cheol Lee (Daegu Gyeongbuk Institute of Science and Technology)
- SP3-003** A633 **The Motor Control System for Transfer Robot of Smart Farm and Smart Factory**  
Seong Hyeon Choi (Korea Maritime and Ocean University)  
Sang Cheol Lee (Daegu Gyeongbuk Institute of Science and Technology)

## **POSTER 2**

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**SP3-004 A634 Development of Guidance Robot for the Visually Impaired Using UWB Sensor**

A Hyeon Kim (Dong-A University)

Sang Cheol Lee (Daegu Gyeongbuk Institute of Science and Technology)

Su Jin Baek (Dong-Eui University)

Jong Wook Kim (Dong-A University)

**SP3-005 A635 Method of Noise Cancellation by Applying a Median Filter and Kalman Filter to UWB Sensor Data**

Su Jin Baek (Dong-A University)

Sang Cheol Lee (Daegu Gyeongbuk Institute of Science and Technology)

A Hyeon Kim (Dong-A University)

Jong Wook Kim (Dong-A University)

July 19 (Wed) 15:20-16:10

Ocean Hall

#### 4. Materials & Design

- PP4-054** A118 **Shape Variables Design of Plate Heat Exchanger Using Deep Neural Network**  
ChanGoo Lee (Hanyang University)  
SeogYoung Han (Hanyang University)  
SungJun Jeon (Hanyang University)
- PP4-055** A156 **A Study on Design Improvement of Door Handles in Refrigerator**  
Dong Hwa Kim (DAEDONG)
- PP4-056** A333 **Evaluation of Chattering in a Poppet-type Check Valve regarding to Differential Pressure**  
Hyeon-Ho Lee (Dong-A University)  
Seung-Ho Han (Dong-A University)  
Hae-Seong Hwang (Dong-A University)
- PP4-057** A430 **Early Cycle Data-based State of Health Prediction of Lithium-ion Battery Using Machin Learning Techniques**  
Sungwon Lee (Chung-Ang University)  
Janghyuk Moon (Chung-Ang University)
- PP4-058** A434 **Designing Mechanically Stable High-capacity SiO<sub>x</sub> Anode Using Stress-diffusion Model**  
Jaehyun Kim (Chung-Ang University)  
Janghyuk Moon (Chung-Ang University)
- PP4-059** A435 **Enhancing Lithium-ion Transport Properties in Electrolytes for Low-temperature Operation of Batteries through High-throughput Screening, Data-driven Prediction and Multi-Scale Simulations**  
Hongjun Chang (Chung-Ang University)  
Janghyuk Moon (Chung-Ang University)  
Yoojin Park (Chung-Ang University)
- PP4-060** A463 **Design of High Performance Airless Tire Using Three-dimensional Auxetic Inner Structures**  
Doyeon Kim (Pusan National University)  
Sanghu Park (Pusan National University)  
Jaewon Choi (The University of Akron)

**POSTER 3**

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- PP4-061** A464 **Study on the Mechanical and Electrical Characteristics of CNTs-metal Multilayer for Electric Contact Element**  
Sang-Hoon Lee (Kyungpook National University)  
Hyun-Joon Kim (Kyungpook National University)
- PP4-062** A471 **Electromagnetic-mechanical Performance Analysis and Experimental Validation of Electric Propulsion System with Contra-rotating Propeller**  
Tae-Woo Lee (Korea Electrotechnology Research Institute)  
Do-Kwan Hong (Korea Electrotechnology Research Institute)  
Jang-Hyun Park (University of Science and Technology)
- PP4-063** A484 **Performance Comparison of Machining Feature Recognition: Deep Learning-based Methods and Algorithm-based Methods**  
Seungeun Lim (Korea University)  
Duhwan Mun (Korea University)  
Changmo Yeo (Korea University)
- PP4-064** A502 **Physics-informed Neural Networks for Magneto-active Elastic Shells**  
Myeongryun Seong (POSTECH)  
Jeeun Kim (POSTECH)  
Anna Lee (POSTECH)
- PP4-065** A512 **Design of Cube-based Robotic Gripper System for Picking and Loading of Vehicle Structure Items**  
Jaemyung Huh (Korea University)  
Daehie Hong (Korea University)  
Chulwhan Im (Korea University)
- PP4-066** A515 **Wrinkling of Thin Films between Two Soft Layers for Stretchable Circuits with High Packing Density**  
Hyunsu Kwak (POSTECH)  
Anna Lee (POSTECH)  
Jeongrak Lee (POSTECH)
- PP4-067** A523 **Effect of Surface Roughness of Contact Faces in SHPB Test Results**  
Taek Jin Jang (KAIST)  
JongBong Kim (Seoul National University of Science and Technology)  
Jeong Whan Yoon (KAIST)
- PP4-068** A548 **Estimation of Blowdown Occurring in Safety Valve regarding to Change of Disc Diameters**  
Haeseong Hwang (Dong-A University)  
Seungho Han (Dong-A University)  
Hyeonho Lee (Dong-A University)

- PP4-069** A553 **Development of a Design Feature Extraction Method based on an Implicit CAD System and a Convolutional Neural Network to Support Design for Additive Manufacturing**  
Sang-In Park (Incheon National University)  
Sungmo Goo (University of Incheon)
- PP4-070** A572 **Optimization Design of a Heat Sink for Head Up Display by using Design for Additive Manufacturing**  
Jae-Wook Lee (Korea Institute of Industrial Technology)  
Ji-Hyun Sung (Korea Institute of Industrial Technology)  
Ki-Man Bae (Ijitech Co., Ltd.)  
Kun Woo Kim (Korea Institute of Industrial Technology)  
Da-Hye Kim (Korea Institute of Industrial Technology)  
Soon-Deok Kwon (Gyeongbuk Hybrid Technology Institute)  
Ji-Hun Mun (Gyeongbuk Hybrid Technology Institute)
- PP4-071** A591 **Evaluation of Magnetic Properties according to Ni Content in Nickel Steel**  
Suheon Kim (Korea Institute of Industrial Technology)  
Sunmi Shin (Korea Institute of Industrial Technology)  
Ho Sung Jang (Korea Institute of Industrial Technology)  
Ho Joon Moon (POSTECH)  
Suyeon Lee (POSTECH)  
Jung-Wook Cho (POSTECH)  
Yoon Suk Choi (Pusan National University)
- PP4-072** A593 **Effect of Residual Stress on Pore Formation in Multi-materials Deposited by Directed Energy Deposition**  
Hak-Sung Lee (Dong-A University)  
Jong Bae Jeon (Dong-A University)

**POSTER 3**

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**5. Micro/Nano Technology**

- PP5-001** A007 **Effect of Titanium Layer on Wear Behavior of DLC**  
Won-Bin Kang (Yonsei University)  
Dae-Eun Kim (Yonsei University)
- PP5-002** A061 **Displacement of 3-DOF Inchworm Using Butterfly-type Strain Characteristics of Piezoelectric Actuator**  
Hayata Takashima (Aichi Institute of Technology)  
Akihiro Torii (Aichi Institute of Technology)  
Suguru Mototani (Aichi Institute of Technology)  
Kae Doki (Aichi Institute of Technology)
- PP5-003** A068 **A Particle Array-based Plastic Lateral Flow Assay Chip for Multiplex Detection of Infectious Diseases**  
Juyeong Kim (Dongseo University)  
Hojin Kim (Dongseo University)  
Hye Jin An (Dongseo University)  
Da Bin Kim (Dongseo University)  
Sangmin Lee (Dong-Eui University)  
Sanghyun Lee (Dong-Eui University)
- PP5-004** A074 **Effect of V-shape Groove on Stretchable Wavy Circuit**  
Jung-Hoon Yun (Kongju National University)  
Oluwabukola Adebisi (Kongju National University)
- PP5-005** A078 **Fabrication of Metal-ceramic Composite Structures Using Photo-polymerization Type 3D Printing and Co-sintering**  
Jeong Seon Im (Seoul National University of Science and Technology)  
Minsoo Park (Seoul National University of Science and Technology)  
Jinkyoo Chung (Seoul National University of Science and Technology)
- PP5-006** A079 **Experimental Study on the Reduction of Chipping Defects during Mechanical Dicing**  
Naeun Lee (Seoul National University of Science and Technology)  
Minsoo Park (Seoul National University of Science and Technology)  
Seungmo Kim (Korea University of Technology and Education)
- PP5-007** A085 **Magnetically Responsive Artificial Cilia Self-assembled with Magnetic Particles**  
Hoon Eui Jeong (UNIST)  
Minsu Kang (UNIST)

- PP5-008 A106** **Effect of Ti Thin Film on Glass Welding Using Nanosecond Pulsed Laser**  
Dae-Seob Song (Seoul National University)  
Sung-Hoon Ahn (Seoul National University)  
Jung-Woo Park (Seoul National University)  
Geun-Young Kim (Seoul National University)
- PP5-009 A107** **High Aspect Ratio Patterning of Ag NP Inks via Inkjet Printing with Laser Selective Surface Treatment**  
I Seok Sim (Korea Institute of Industrial Technology)  
Jun Young Hwang (Korea Institute of Industrial Technology)  
Seong Ju Park (Korea Institute of Industrial Technology)  
Kwon Yong Shin (Korea Institute of Industrial Technology)  
Chanwoo Yang (Korea Institute of Industrial Technology)  
Heui Seok Kang (Korea Institute of Industrial Technology)  
Seung-Jae Moon (Hanyang University)
- PP5-010 A125** **Biomimetic 3D Scaffold based on Electrospun Micro/Nanofibers for Tissue Engineering Application**  
Sunhee Cho (Chonbuk National University)  
Cheol Sang Kim (Chonbuk National University)  
Se Rim Jang (Chonbuk National University)  
Il Won Suh (Chonbuk National University)  
Jeesoo Park (Chonbuk National University)
- PP5-011 A155** **Development of a New Perfusion Bioreactor for the Evaluation of Small-diameter Fibrous Tubular Scaffold**  
Se Rim Jang (Chonbuk National University)  
Cheol Sang Kim (Chonbuk National University)  
Sunhee Cho (Chonbuk National University)  
Il Won Suh (Chonbuk National University)  
Jeesoo Park (Chonbuk National University)
- PP5-012 A172** **Multi-functional Self-assembled Electrospun Nanofiber Filters for PM Removal and Formaldehyde Gas Sensing Simultaneously**  
Jin Yeong Song (Pusan National University)  
Sang Min Park (Pusan National University)  
Seongmin Kim (Pusan National University)  
Jaeseong Park (Pusan National University)

**POSTER 3**

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- PP5-013 A173 A Study for Single Layer Textile Based Co-laminar Flow Enzymatic Biofuel Cell**  
Hee Beom Kang (Hanyang University)  
Yoomin Ahn (Hanyang University)  
Young Ju Gwon (Hanyang University)  
Yeon Woo Cha (Hanyang University)  
Chao Wang (Hanyang University)  
Tae Hyeon Kim (Hanyang University)  
Yeong Jin Joo (Hanyang University)
- PP5-014 A188 Dynamics of Droplet in Oblique Impact on PTFE Coated Surfaces**  
Sungchan Yun (Korea National University of Transportation)  
Hong Ju Jung (Korea National University of Transportation)
- PP5-015 A196 Dual Beam Combined Laser Processing of Nanostructured Amorphous Silicon**  
Won Seok Chang (Korea Institute of Machinery and Materials)  
Seok Young Ji (Korea Institute of Machinery and Materials)  
Hye Su Kim (Korea Institute of Machinery and Materials)  
Jun Hee Jo (Korea Institute of Machinery and Materials)
- PP5-016 A200 Recent Progress in Transparent Thermal Emitter for Radiative Cooling**  
Kang Won Lee (Hanyang University)  
Dong Rip Kim (Hanyang University)  
Jounhun Yi (Hanyang University)  
Kyung Ho Yoo (Hanyang University)
- PP5-017 A201 Recent Progress in Fabrication of Phase Change Composites for Effective Thermal Energy Storage**  
Hyeon Woo Son (Hanyang University)  
Dong Rip Kim (Hanyang University)  
Se Won Kim (Hanyang University)
- PP5-018 A202 Engineered Stainless Steel Surface by Thermal Processing for Anti-scaling Functionality**  
Jung Bin Yang (Hanyang University)  
Dong Rip Kim (Hanyang University)  
Jaehee Cho (Hanyang University)
- PP5-019 A217 Evaluation of X-ray Mirror Surface Fabricated by Differential Deposition Method**  
Jangwoo Kim (POSTECH)  
Jung Sue Kim (POSTECH)  
Jun Lim (POSTECH)

- PP5-020** A221 **Quasi-Seamless Alignment Method using the Periodicity of Patterns in Various Shapes**  
Woo Young Kim (Changwon National University)  
Young Tae Cho (Changwon National University)  
Seok Kim (Changwon National University)
- PP5-021** A222 **Study on Piezoresistive SiC MEMS Using First-principle Calculation Method**  
Chen Wu (The University of Tokyo)  
Michitaka Yamamoto (The University of Tokyo)  
Seiichi Takamatsu (The University of Tokyo)  
Xudong Fang (Xi'an Jiaotong University)  
Ryutaro Maeda (AIST)  
Toshihiro Itoh (The University of Tokyo)
- PP5-022** A223 **A Study on the Improvement of Cross Section Milling Rate of Si Wafer according to the Center of Broad Ion Beam and Position of Mask**  
Jong Han Won (Korea Electronics-Machinery Convergence Technology Institute)  
Dong Young Jang (Korea Electronics-Machinery Convergence Technology Institute)  
Man Jin Park (Korea Electronics-Machinery Convergence Technology Institute)  
Ji Hye Park (Korea Electronics-Machinery Convergence Technology Institute)  
Su Hyun Park (Korea Electronics-Machinery Convergence Technology Institute)
- PP5-023** A224 **Study of Ion beam Characteristics According to Extractor Structure of Xe Plasma FIB**  
Jung Seok Park (Korea Electronics-Machinery Convergence Technology Institute)  
Dongyoung Jang (Korea Electronics-Machinery Convergence Technology Institute)  
Manjin Park (Korea Electronics-Machinery Convergence Technology Institute)  
Kihwan Kim (Korea Electronics-Machinery Convergence Technology Institute)  
Jungnam Park (Korea Electronics-Machinery Convergence Technology Institute)
- PP5-024** A233 **Extraction of Micro Size Cellulose from Waste Dried Leaves as Potential Reinforcement to Biodegradable Thermoplastic**  
Vinitsa Chanthavong (Changwon National University)  
Jung-Il Song (Changwon National University)
- PP5-025** A245 **Fabrication of Laser-induced Graphene Triboelectric Nanogenerator**  
Do Young Kim (Pusan National University)  
Sang Min Park (Pusan National University)  
Baek Gyu Kim (Pusan National University)

**POSTER 3**

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- PP5-026 A254 Effect of Applied Cathodic Current Density on the Through Hole Filling by Copper Electroplating**  
Chan Young Kim (Korea Institute of Industrial Technology)  
Se Kwon Oh (Korea Institute of Industrial Technology)  
Hee Gwon Shin (Korea Institute of Industrial Technology)  
Jun Ho Lee (Korea Institute of Industrial Technology)  
Seo Youn Kim (Korea Institute of Industrial Technology)
- PP5-027 A255 Fabrication of Deep Holes in Tungsten Carbide Using Surfactant-mixed Powder Based  $\mu$ -EDM**  
Sai Dutta Gattu (Keio University)  
Jiwang Yan (Keio University)
- PP5-028 A256 Facile and Rapid Microfabrication for Functional Surface Using Variable Resolution Method**  
Jaebum Sung (Hanyang University)  
Hongyun So (Hanyang University)
- PP5-029 A257 Indirect Irradiation Method for Overcoming Limitations of Near Infrared Laser in Microfluidic Device Fabrication**  
Geun Young Kim (Seoul National University)  
Sung-Hoon Ahn (Seoul National University)  
Dae-Seob Song (Seoul National University)
- PP5-030 A260 A Study on Diffraction Suppression Using Optical Path Control in SPPW Hybrid MLA Process**  
Seungwoo Shin (Changwon National University)  
Young Tae Cho (Changwon National University)  
Seok Kim (Changwon National University)
- PP5-031 A267 Design a Microscopic Mechanical Response System to Analyze Effects of Monotonic and Cyclic Loading**  
Chan Nyeong Yun (Korea Electronics-Machinery Convergence Technology Institute)  
Dongyoung Jang (Korea Electronics-Machinery Convergence Technology Institute)  
Kyu Song (Korea Electronics-Machinery Convergence Technology Institute)  
Jihye Park (Korea Electronics-Machinery Convergence Technology Institute)  
Suhyun Park (Korea Electronics-Machinery Convergence Technology Institute)  
Nakkyun Cho (Seoul National University of Science and Technology)

- PP5-032 A288** **Continuous and Scalable Patterning of Period- and Shape-tunable Asymmetric Nanogratings by Azimuthal Rotation-controlled Dynamic Nanoinscribing**  
Jong G. Ok (Seoul National University of Science and Technology)  
Dong Kyo Oh (POSTECH)  
Useung Lee (Seoul National University of Science and Technology)  
Hyein Kim (Seoul National University of Science and Technology)
- PP5-033 A317** **Injectable Opto-probe with Heat Dissipation Guide for Photodynamic Therapy Using Thermal Management**  
Min Jun Gwak (Sungkyunkwan University)  
Taeil Kim (Sungkyunkwan University)
- PP5-034 A328** **A Scalable Self-assembled Magnetic Millirobot with Multimodal Locomotion Capability**  
Yonghun Lee (Kongju National University)  
Seungmun Jeon (Kongju National University)  
Seungwon Seo (Kongju National University)  
Younghye Kim (Kongju National University)
- PP5-035 A334** **Parameter Optimization Using Machine Learning Technique for Copper Electroplating in Semiconductor Interconnect Technology**  
Mingi Kim (Dankook University)  
Seoung Jai Bai (Dankook University)  
Hyunjun Yang (Seoul National University)  
Seungmin Oh (Seoul National University)  
Suk Won Cha (Seoul National University)
- PP5-036 A335** **Simultaneous Generation of Monodisperse Droplets with Two Different Sizes Using High-aspect-ratio Asymmetric Cross-sectional Channel**  
Youngseo Cho (Seoul National University of Science and Technology)  
Younghak Cho (Seoul National University of Science and Technology)
- PP5-037 A341** **Micro lens Array-assisted Portable Microscopy for High-resolution Imaging**  
Kisoo Kim (Korea Photonics Technology Institute)
- PP5-038 A343** **Fabrication and Characterization of Slippery Liquid-infused Porous Surfaces: An Approach to Improved Anti-icing and Anti-fouling Performance**  
Sang Hoon Lee (Changwon National University)  
Young Tae Cho (Changwon National University)  
Woo Young Kim (Changwon National University)  
Seok Kim (Changwon National University)

## POSTER 3

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- PP5-039 A369 Poisson Effect-assisted Replication Lithography for Repetitive Fabrication of 3D Microstructures**  
Minsu Kim (Kyungpook National University)  
Moon Kyu Kwak (Kyungpook National University)  
Dokyung Kyeong (Kyungpook National University)
- PP5-040 A377 Characterization of a Photoresist based on Physical Models**  
Seungtae Park (Chosun University)  
Jong-Rak Park (Chosun University)  
Haehyuck Kwon (Chosun University)
- PP5-041 A381 Determination of Aerial Image Using Developed Resist Profile for a Raster Scan Laser Pattern Generator**  
Haehyuck Kwon (Chosun University)  
Jong-Rak Park (Chosun University)  
Seungtae Park (Chosun University)
- PP5-042 A392 Gate-controlled Gas Sensor Utilizing 1D-2D Hybrid Nanomaterials**  
Myung Gwan Hahm (Inha University)  
Moonsang Lee (Inha University)  
Sung Moo Song (MSG Solution)
- PP5-043 A395 The Role of 3D Micropatterns in Control of the Wetting Behavior of Liquids**  
Myung Seo Kim (Changwon National University)  
Young Tae Cho (Changwon National University)  
Seung Min Oh (Changwon National University)  
Seok Kim (Changwon National University)
- PP5-044 A398 Controlling Droplet Volume in Droplet Array Chips Using Different Size of Extreme Wettability Patterns and Dipping Process**  
Mohammad Imran Bappy (University of Ulsan)  
Doo-Man Chun (University of Ulsan)  
Ngoc Giang Tran (University of Ulsan)
- PP5-045 A432 High-temperature Heat Treatment for Enhancing the Adhesion Properties of Electroless Plated Layers on a Flexible Substrate**  
Doyeon Im (Andong National University)  
Taechang An (Andong National University)  
Geon Hwee Kim (Chungbuk National University)
- PP5-046 A443 Focus Tunable Compound Eyes using Elastomeric Microlens Arrays**  
Jihyun Jung (Pusan National University)  
Kyujung Kim (Pusan National University)

- PP5-047 A456 Interfacial Adhesion Control via Reduction of Graphene Oxide for Heterogeneous Material Integration**  
Il Ryu Jang (Korea Institute of Industrial Technology)  
Hohyun Keum (Korea Institute of Industrial Technology)  
Janghee Choi (Korea Institute of Industrial Technology)  
Hoe Joon Kim (Daegu Gyeongsbuk Institute of Science and Technology)
- PP5-048 A457 A Comparative Study on the Processability of Nanosecond and Femtosecond Laser for LiFePO<sub>4</sub> Cathode Material Laser Structuring**  
Jaegeun Shin (Kongju National University)  
Dongkyung Lee (Kongju National University)  
Mincheoul Seong (Kongju National University)  
Myeungho Park (Kongju National University)  
Haeun Kim (Kongju National University)
- PP5-049 A458 Soft Lithography of a Large Area Intermediate Mold from Photoresist on Silicon Substrate**  
Munhyung Jo (KAIST)  
Usama Tahir (KAIST)  
Dongjin Kim (KAIST)  
Gusatvo Panama Perugachi (KAIST)  
Seung S. Lee (KAIST)
- PP5-050 A480 Quantitative Study of Thermal Bonding for UV Modified PMMA**  
Geundong Bae (Kyungnam University)  
Taehyun Park (Kyungnam University)
- PP5-051 A505 Enhancing Anti-icing Properties by Direct Micro Metal Forming**  
Seongyong Byun (Chung-Ang University)  
Seok-min Kim (Chung-Ang University)  
Jun Kim (Chung-Ang University)
- PP5-052 A525 Study on Oil-in-oil Droplet Generation based on Flow-focusing Geometry Using Ehd Micropumps**  
Taiki Otomo (Tokyo Institute of Technology)  
Joon-wan Kim (Tokyo Institute of Technology)  
Akihiro Yasuda (Tokyo Institute of Technology)  
Siqi Peng (Tokyo Institute of Technology)  
Kazuhiro Yoshida (Tokyo Institute of Technology)

## POSTER 3

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- PP5-053** A530 **Isotype Heterostructured p-WSe<sub>2</sub>/p-Si Photodetector with Improved Photoresponsivity and Detectivity**  
Beomsu Jo (Gangneung-Wonju National University)  
Young Lae Kim (Gangneung-Wonju National University)
- PP5-054** A539 **Megasonic Generation and Application of High-density Nanobubbles**  
Seung-Yop Lee (Sogang University)  
Han-Bok Seo (Sogang University)
- PP5-055** A546 **Evaluation of The Mechanical Properties of Stents based on Energy Beam Treatment**  
Goeun Cha (Kyungpook National University)  
Jongsung Park (Kyungpook National University)
- PP5-056** A564 **Experimental study of Surface Treatment for Copper-aluminum Alloys Using a Laser**  
Chanhee Jeong (Kongju National University)  
Dongkyoung Lee (Kongju National University)  
Seungik Son (Kongju National University)
- PP5-057** A588 **Fabrication of Porous Microspheres with Controllable Pore Size based on Microdroplet Mixing Using Microfluid System**  
Ji Hwan Han (Kyungpook National University)  
Gyu Man Kim (Kyungpook National University)  
Chul Min Kim (Gyeongsang National University)  
Cheol Woo Park (Kyungpook National University)  
Tae Hyun Kim (Tissue Engineering Bio Science)
- PP5-058** A598 **Research on a Methodology for Predicting Nanometer-scale Surface Roughness of SPDT-machined polycrystalline ZnS**  
Mincheol Kim (Korea Basic Science Institute)  
Woo-Jong Yeo (Korea Basic Science Institute)  
Hwan-Jin Choi (Korea Basic Science Institute)  
Minwoo Jeon (Korea Basic Science Institute)  
Hyo-Sik Kim (Korea Basic Science Institute)
- PP5-059** A637 **A Study on the Effect of Capillary Force on the Mechanical Deformation of Metal Nanowires**  
Pyeongsam Ko (Hanbat National University)  
Hongseok Youn (Hanbat National University)  
Jinsung Rho (Hanbat National University)

## 6. Bio & Health

- PP6-001 A014 A Clinical Study of the Effects of the Various Cuff Types of the Electrically Powered KAFO for Stroke Patients**  
 Hyuk-Jae Choi (Korea Orthopedics & Rehabilitation Engineering Center)  
 Chil-Yong Kwon (Korea Orthopedics & Rehabilitation Engineering Center)  
 Jong-Won Lee (Korea Orthopedics & Rehabilitation Engineering Center)  
 Yoon Heo (Korea Orthopedics & Rehabilitation Engineering Center)  
 Gyo-Suk Kim (Korea Orthopedics & Rehabilitation Engineering Center)  
 Hyeonseok Cho (Korea Orthopedics & Rehabilitation Engineering Center)
- PP6-002 A063 Efficacy Assessment of Scaffold Shape Conformity on Bone Regeneration**  
 Min-Soo Ghim (Wonkwang University)  
 Young-Sam Cho (Wonkwang University)  
 Eun-Yong Choi (Daejeon St. Mary's Hospital)  
 Young Yul Kim (Daejeon St. Mary's Hospital)
- PP6-003 A066 Optimization of Nano/Micro Pillar Rectangular Pattern for Differentiation of Pre-osteoblastic MC3T3-E1 Cells**  
 Nae-un Kang (Wonkwang University)  
 Young-Sam Cho (Wonkwang University)  
 Ga Hyun Kim (Daejeon St, Mary's Hospital)  
 Jeong Hun Park (Wonkwang University)  
 Yun-jin Yu (Wonkwang University)  
 Young Yul Kim (Daejeon St, Mary's Hospital)  
 Hyun-Ha Park (Wonkwang University)
- PP6-004 A080 Correlation Analysis between Stress Indexes of Industrial Workers**  
 Jong-Hyun Kim (Korea Institute of Industrial Technology)  
 Chang Gi Lee (Korea Institute of Industrial Technology)  
 Hyun Chul Tae (Korea Institute of Industrial Technology)  
 Young Sub Shin (Korea Institute of Industrial Technology)  
 Jae Soo Hong (Korea Institute of Industrial Technology)  
 Jeong Yeol Kim (Korea Institute of Industrial Technology)
- PP6-005 A083 Fabrication of a Paper-based Sensor with High Resolution and Rapid Detection of Plant Drought Stress**  
 Ji Kwan Kim (Gwangju University)  
 Young Soo Choi (Gwangju University)

**POSTER 3**

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- PP6-006 A084 Reusable Echinoid-shaped Al<sub>2</sub>O<sub>3</sub> Surface with Mechano-bactericidal Function**  
Hee-Kyeong Kim (Wonkwang University)  
Hyun-Ha Park (Wonkwang University)  
Hyeong Woo Baek (Wonkwang University)  
Young-Sam Cho (Wonkwang University)
- PP6-007 A093 Fabrication of Electrospun Polycaprolactone (PCL) Substrate for Colorimetric Bio-assay**  
Chensong Xu (The University of Tokyo)  
Beomjoon Kim (The University of Tokyo)  
Gwenael Bonfante (The University of Tokyo)  
Jongho Park (The University of Tokyo)  
Vincent Salles (The University of Tokyo)
- PP6-008 A096 Air-able : Fabrication and Experiments of Effervescent Fabric Chamber Inflation with Various Shape of Structures and Wearables**  
Sanghu Chun (Kangwon National University)  
Yong-Jai Park (Kangwon National University)
- PP6-009 A105 Muscle Activity Analysis according to Steering Angles during the Turning of a Two-person Tricycle for the Elderly and Persons with Disability**  
Jong-Hyun Kim (Korea Institute of Industrial Technology)  
Jae Soo Hong (Korea Institute of Industrial Technology)
- PP6-010 A120 Workload Assessment Method Using Graph Neural Network**  
Jaekyeong Moon (Korea Institute of Industrial Technology)  
Hyunchul Tae (Korea Institute of Industrial Technology)
- PP6-011 A132 Development and Biomechanical Evaluation of Expansion-type Anchors for Anterior Cruciate Ligament Reconstruction**  
Il Won Suh (Chonbuk National University)  
Cheol Sang Kim (Chonbuk National University)  
Se Rim Jang (Chonbuk National University)  
Jeesoo Park (Chonbuk National University)  
Sun Hee Cho (Chonbuk National University)

- PP6-012** A136 **Precise Control of Lipid Vesicles Size Using Characteristic Time depends on Membrane Conditions**  
Sunhak Choi (Seoul National University)  
Hosup Jung (Seoul National University)  
Jihun Jeon (Seoul National University)  
Yeonghwan Son (Seoul National University)  
Moon Kyu Kwak (Kyungpook National University)  
Keesung Kim (Seoul National University)
- PP6-013** A183 **Analysis of the Effects of Various Positions and Physiological Movements on the Lumbar Spine: A Finite-element Study**  
Mingoo Cho (Korea Institute of Industrial Technology)  
Sungwook Kang (Korea Institute of Industrial Technology)  
Hyunsoo Kim (Korea Institute of Industrial Technology)  
Jongmoon Hwang (Kyungpook National University)
- PP6-014** A190 **Effects of Basic Physical Fitness-based Personalized Augmented Reality Exercise Program on Physical Factors: Randomized Control Trials**  
JaeHo Yu (Sunmoon University)
- PP6-015** A206 **Hybrid Biofabrication Technique to Fabricate Innervated in vitro Gut Models**  
Hohyeon Han (POSTECH)  
Jinah Jang (POSTECH)  
MinJi Kim (POSTECH)  
Yoo-mi Choi (POSTECH)  
Uijung Yong (POSTECH)
- PP6-016** A230 **Development of Multi-calibration Technology for Wire-based 1RM Measurement Load Cells**  
Jung Hwan Kim (National Rehabilitation Center)  
Hyun Jong Lee (National Rehabilitation Center)  
Seck Jin Kim (National Rehabilitation Center)  
Seung Mo Jin (National Rehabilitation Center)  
Jea Hak Kim (National Rehabilitation Center)  
Hogene Kim (National Rehabilitation Center)
- PP6-017** A264 **Fabrication of Spheroid-based Functional 3D Adipose Construct Using In-bath Bioprinting**  
Jae-Seong Lee (Pusan National University)  
Byoung Soo Kim (Pusan National University)  
Minjun Ahn (Pusan National University)

**POSTER 3**

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- PP6-018** A271 **Maturation of Cardiomyocytes Promoted by Embedded-AgNW & Mechanical Stimulation**  
Jongyun Kim (Chonnam National University)  
Dong-Weon Lee (Chonnam National University)
- PP6-019** A279 **Characteristics of Microcell Structure Using Foam Injection Molding for Scaffold of Cell Culture**  
Jeongyeon Park (Korea Institute of Industrial Technology)  
Gilsang Yoon (Korea Institute of Industrial Technology)  
Jungeon Son (Korea Institute of Industrial Technology)
- PP6-020** A285 **Comparison of Simulated Environment and Real Environment Usability Test of Beach Wheelchair**  
Minra Choi (Seongnam Senior Industrial Innovation Center)  
Dukyoung Jung (Seongnam Senior Industrial Innovation Center)  
Wonho Gu (Seongnam Senior Industrial Innovation Center)  
Hyunyoung Cho (Seongnam Senior Industrial Innovation Center)
- PP6-021** A298 **Development of 3D Bioprinted Cancer Stem Cells-including Tumor Platform for Investigating the Role of Matrix Stiffness in Cancer Progression**  
Seok-hyeon Lee (Pusan National University)  
Byoung Soo Kim (Pusan National University)  
Minjun Ahn (Pusan National University)  
Won-Woo Cho (POSTECH)  
Dong-Woo Cho (POSTECH)
- PP6-022** A350 **Volumetric Segmentation of a Clavicle Bone Structure with Small ROI from Whole Body CT Images**  
Seungjin Kong (Inje University)  
Donghyun Kim (Korea Institute of Industrial Technology)  
Heecheol Kim (Inje University)  
Sungho Lee (Korea Institute of Industrial Technology)
- PP6-023** A365 **A Layered Patch with Placenta-derived ECM by 3D Bioprinting for Diabetic Wound Healing**  
Hye Jin Kim (POSTECH)  
Jinah Jang (POSTECH)  
Yeonggwon Jo (POSTECH)  
Ji Hwan Kim (POSTECH)  
Yoo-mi Choi (POSTECH)  
Hwan Yong Choi (POSTECH)

- PP6-024 A372** **The Development of Prosthetic Foot with the Function of Metatarsophalangeal and Ankle Joint for Lower Limb Amputee**  
Hyun Cheol Kim (Korea Orthopedics & Rehabilitation Engineering Center)  
Sehoon Park (Korea Orthopedics & Rehabilitation Engineering Center)  
Hyeon-Seok Cho (Korea Orthopedics & Rehabilitation Engineering Center)  
Unchung Cho (Tech University of Korea)
- PP6-025 A401** **Engineering Uniform Epidermal Layers Using Gelatin-based Sacrificial Bioink for Improved 3D Skin Bioprinting**  
Minjun Ahn (Pusan National University)  
Byoung Soo Kim (Pusan National University)  
Jae-Seong Lee (Pusan National University)
- PP6-026 A411** **3D Bioprinting-based Stenotic Blood Vessels for Modeling Turbulent Flow Generation and Investigating Hemodynamic Effects on Atherosclerosis Development**  
Min-Ju Choi (Pusan National University)  
Byoung Soo Kim (Pusan National University)  
Wonbin Park (POSTECH)  
Minjun Ahn (Pusan National University)
- PP6-027 A419** **Optimal Design of Pre-vascularized Patch Using In-bath 3D Bioprinting for Enhanced Skin Regeneration**  
Arvind Kumar Shukla (Pusan National University)  
Byoung Soo Kim (Pusan National University)  
Minjun Ahn (Pusan National University)  
Won-Woo Cho (POSTECH)  
Jae-Seong Lee (Pusan National University)  
Dong-Woo Cho (POSTECH)
- PP6-028 A442** **Sputum Sound Classification System for Rabbits with a Tracheostomy Tube**  
Yohan Jung (Yonsei University)  
Jongbaeg Kim (Yonsei University)  
Hyunbum Kim (Catholic University of Korea)  
Daeyeon Koh (Yonsei University)  
Hyunjun Han (Yonsei University)  
Younghoon Joo (Catholic University of Korea)
- PP6-029 A483** **Study of Gait Characteristics According to Pelvic Balance**  
Yunjee Hong (Dankook University)  
Sung Han Rhim (Dankook University)  
Yeji Choi (Dankook University)

**POSTER 3**

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- PP6-030 A486 Development of Cryogenic Vial Technology for Long-term Storage of Suspended Cell-based Therapeutics**  
Jeongyeon Park (Korea Institute of Industrial Technology)  
Gilsang Yoon (Korea Institute of Industrial Technology)  
Jungeon Son (Korea Institute of Industrial Technology)  
Sunray Lee (CEFO Co., Ltd.)  
Dongmok Lee (Korea Institute of Industrial Technology)  
Hyunsook Park (CEFO Co., Ltd.)
- PP6-031 A487 Shear Stress-induced Alignments of Skeletal Muscle Tissue via In-bath 3D Bioprinting**  
Jae Woo Back (Pusan National University)  
Byoung Soo Kim (Pusan National University)  
Minjun Ahn (Pusan National University)
- PP6-032 A537 One Pot Hydrothermal Synthesis of CuS/MoS<sub>2</sub> Composite for Electrochemical Non-enzymatic Glucose Sensor**  
Miyeon Shin (Jeonbuk National University)  
Changho Yu (Jeonbuk National University)  
Krishna Prasad Sharma (Jeonbuk National University)
- PP6-033 A540 Development of Universal Exercise Equipment Guideline based on STEP Tool and Universal Design Principles**  
Kwang Ok An (Korea National Rehabilitation Center)  
Hyosun Kweon (Korea National Rehabilitation Center)  
Myo Jung Choi (Korea National Rehabilitation Center)  
Sung Shin Kim (Korea National Rehabilitation Center)  
Young-Hyeon Bae (Korea National Rehabilitation Center)
- PP6-034 A545 3D-force-sensor Based Smart Shoes for Abnormal Gait Detection with Embedded AI System Powered by Energy Harvesting**  
Dongjun Kim (Kyung Hee University)  
Jumyung Um (Kyung Hee University)  
Mi Song Nam (Kyung Hee University)  
Sumin Cho (Kyung Hee University)  
Yun Jung Heo (Kyung Hee University)  
Dongwhi Choi (Kyung Hee University)  
Hee Kyung Ahn (Gachon University Gil Medical Center)

- PP6-035 A619** **A Practical Approach to Virtual Reality-based Surgical Planning for Three-dimensional Cephalometric Analysis**  
Chanho Song (KMEDIhub)  
Euisung Jung (KMEDIhub)  
Yooseo Jeong (KMEDIhub)  
Donghwan Hwang (KMEDIhub)  
Shinhye Kim (KMEDIhub)  
Hyeseung Yoon (KMEDIhub)
- PP6-036 A646** **Exosome Derived from Human Adipose Stem Cells (ASC) Exosome Exert Therapeutic Effect on Inhalation Injury with Caused by Burns in vitro and in vivo**  
You-Rin Kim (Hallym University)  
Wook Chun (Hallym University)  
Dogeon Yoon (Hallym University)  
Ji-Seon Lee (Hallym University)  
Ji-Hye Park (Hallym University)

POSTER 4

July 20 (Thu) 16:15-17:05

Ocean Hall

**1. Manufacturing Processes**

- PP1-073** A025 **Development of Mold Core Processing Technology for Molding Large-diameter Meniscus Aspherical Lens for Automotive LiDAR**  
MyeongJin Ko (Korea Institute of Industrial Technology)  
Soon Sub Park (Korea Institute of Industrial Technology)
- PP1-074** A151 **A Study on the Thermal Characteristics of the SUS316L Deposition Process for Different Process Parameters**  
Ho-Jin Lee (Korea Institute of Industrial Technology)  
Hejin Song (Korea Institute of Industrial Technology)  
Dong Yong Park (Korea Institute of Industrial Technology)  
Jinseok Jang (Korea Institute of Industrial Technology)
- PP1-075** A179 **Effect of Al Content on Microstructure and Hardness of Cu-Al Alloy Manufactured by Directed Energy Deposition**  
Changliang Yao (Korea Maritime and Ocean University)  
Dosik Shim (Korea Maritime and Ocean University)  
Gwangyong Shin (Korea Photonics Technology Institute)  
Eunho Jung (Korea Maritime and Ocean University)
- PP1-076** A436 **A Study on the Interface Property according to the Position of Inner Lattice Structure in the DED Process**  
Kook Hwa Choi (Korea Maritime and Ocean University)  
Do Sik Shim (Korea Maritime and Ocean University)  
Yeong Min Lee (Korea Maritime and Ocean University)  
Gwang Yong Shin (Korea Institute of Industrial Technology)  
Dong Ju Kim (SEO YEONG Co.,Ltd.)  
Ho Ju Kang (SEO YEONG Co.,Ltd.)
- PP1-077** A440 **Study on Effect of Ultrasonic Nanocrystal Surface Modification in Bolt Manufactured by Screw Rolling**  
Hyeongjin Ha (Korea Maritime and Ocean University)  
Dosik Shim (Korea Maritime and Ocean University)  
Hanbyeol Park (Korea Maritime and Ocean University)  
Minseong Ko (Korea Maritime and Ocean University)

- PP1-078** A508 **Taxonomy and CAD Feature Extraction Algorithm for Micro-machined Shapes**  
Seong-Gu Kang (Seoul National University of Science and Technology)  
Jihong Hwang (Seoul National University of Science and Technology)  
Jonghwan Kim (Seoul National University of Science and Technology)
- PP1-079** A513 **Energy Consumption Prediction in CNC Milling under Various Machining Parameters**  
Wontaek Song (Yonsei University)  
Byung-Kwon Min (Yonsei University)  
In-Wook Oh (Yonsei University)  
Soon-Hong Hwang (Yonsei University)
- PP1-080** A526 **Milling Method to Reduce Tool Wear considering Fiber Orientation in Multi-directional Carbon Fiber Reinforced Plastic Milling**  
Gyuhoo Kim (Yonsei University)  
Byung-Kwon Min (Yonsei University)  
Jae Seok Shin (Yonsei University)
- PP1-081** A527 **Development of SQRTM Process for Manufacturing CFRP Laminate with Quality Equivalent to Autoclave Process**  
Chan-Joo Lee (Korea Institute of Industrial Technology)  
Min Suk Park (Korea Institute of Industrial Technology)  
Wang Ho Yoon (Korea Institute of Industrial Technology)  
Se Woon Oh (Korea Aerospace Industries, Ltd)  
Seung Su Woo (Korea Aerospace Industries, Ltd)  
Kyoung Min Lee (Korea Aerospace Industries, Ltd)  
Seong Hyeon Yoon (Gyeongnam Technopark)  
Gi Won Jeong (Gyeongnam Technopark)
- PP1-082** A529 **The Weldability of AA 5052 and SPFC 780DP Steel by Hybrid Friction Stir Welding**  
Bum-Su Go (Chosun University)  
Hee-Seon Bang (Chosun University)  
Dong-Min Park (Chosun University)  
Han-Sur Bang (Chosun University)  
Kyoung-Hak Kim (Chosun University)

## POSTER 4

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- PP1-083** A532 **The Mechanical and Electrical Performance of Al-Cu Laser Multi-seam Welded Joints**  
Hye Seul Yoon (Chosun University)  
Hee Seon Bang (Chosun University)  
YoungJin Eun (Chosun University)  
Do Yeon Kim (Chosun University)
- PP1-084** A533 **Printing Path for Improving the Stiffness of 3D-printed CFRP with a Hole**  
Jae Hoon Ahn (Yonsei University)  
Byung-Kwon Min (Yonsei University)  
Gyuho Kim (Yonsei University)
- PP1-085** A536 **Effect of Process Parameters on CFRP/Steel Joints Using Self-Piercing Rivets**  
Dong Won Choi (Chosun University)  
Min Seung Kang (Chosun University)  
Bum Su Go (Chosun University)  
Hee Seon Bang (Chosun University)
- PP1-086** A538 **Automatic Process Planning Framework Utilizing Mesh-based Feature Recognition and Template Selection**  
Yeong-Deuk Kim (Korea Institute of Industrial Technology)  
Dong Yoon Lee (Korea Institute of Industrial Technology)
- PP1-087** A543 **A Study on the Acquisition of Artificial Intelligence Learning Data for the Blow Molding Process Optimization**  
Euichul Jeong (Korea Institute of Industrial Technology)  
Seokkwan Hong (Korea Institute of Industrial Technology)  
Changoh Gwon (Dong-A Precision IND. Co., Ltd.)
- PP1-088** A253 **Development of Micro-surface Curvature Reduction Technology for Door Outer**  
Wonho Kwon (Shin Young Co., Ltd.)  
Jong Deok Seo (Shin Young Co., Ltd.)
- PP1-089** A305 **Material Removal Characteristics of SiC CMP Using Photocatalytic Oxidation**  
Hyunseop Lee (Dong-A University)
- PP1-090** A549 **Tailoring Mechanical Properties of 15-5PH Steel via Additive Manufacturing Followed by Heat Treatment**  
Soo Yeol Lee (Chungnam National University)  
Hobyung Chae (Korea Atomic Energy Research Institute)  
E-Wen Huang (National Yang Ming Chiao Tung University)  
Jun Hyun Han (Chungnam National University)  
Soon-Ku Hong (Chungnam National University)

- PP1-091 A550** **The Effect of Abnormal Vibration during Shoulder Milling on the Surface Quality and Dimensional Accuracy of Parts**  
Ki-Hyeong Song (Korea Institute of Industrial Technology)  
Sung-Ho Nam (Korea Institute of Industrial Technology)  
Eun Seok Nam (Korea Institute of Industrial Technology)  
Dong Yoon Lee (Korea Institute of Industrial Technology)
- PP1-092 A565** **Multiphase Transport Phenomena in Laser Micro/Nano Additive Manufacturing in Aqueous Reacting Fluid**  
Ming-Tsang Lee (National Tsing Hua University)  
Swami Siddharth (Industrial Technology Research Institute)  
Yu-Bin Chen (National Tsing Hua University)
- PP1-093 A567** **The Identification of Machining Defects during CFRP Milling through Machining Sound Analysis**  
Kyeongeun Song (Korea Institute of Industrial Technology)  
Martin B.-G. Jun (Purdue University)  
Gyuho Kim (Yonsei University)  
Tae-Gon Kim (Korea Institute of Industrial Technology)  
Jungsoo Nam (Korea Institute of Industrial Technology)  
Seong Hyeon Kim (Korea Institute of Industrial Technology)  
Kangwoo Shin (Korea Institute of Industrial Technology)  
Seok-Woo Lee (Korea Institute of Industrial Technology)  
Byung-Kwon Min (Yonsei University)
- PP1-094 A574** **Characteristics of Resistance Spot Welding according to Heat Treatment Conditions of 1.8 GPa Grade Al-Si Coated Hot Stamping Boron Steel**  
Jaehun Kim (Korea Institute of Industrial Technology)  
Changwook Ji (Korea Institute of Industrial Technology)  
Jooyong Cheon (Korea Institute of Industrial Technology)  
Sungwook Kang (Korea Institute of Industrial Technology)
- PP1-095 A575** **Analysis of Extrusion Filament of Multi-axis Additive Manufacturing System based on a Robotic Arm**  
Hyeon Seop Jeon (Kyungpook National University)  
Young Hun Jeong (Kyungpook National University)  
Homin Lee (Kyungpook National University)  
Seung-Han Yang (Kyungpook National University)

## POSTER 4

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- PP1-096 A576 Additive Manufacturability of Filler Metal Type on Nickel-Aluminum Bronze Wire Using CMT-based Wire-Arc Additive Manufacturing Process**  
Jooyong Cheon (Korea Institute of Industrial Technology)  
Changwook Ji (Korea Institute of Industrial Technology)  
JaeHun Kim (Korea Institute of Industrial Technology)  
SungWook Kang (Korea Institute of Industrial Technology)
- PP1-097 A584 A Study of Decreasing Scab Defects by Groove Optimized based on FE-simulation for H-beam Products**  
Changhyun Wee (Hyundai Steel)  
Sangjin Lee (Hyundai Steel)  
Hyeonseok Jung (Hyundai Steel)  
Kyungho Seo (Hyundai Steel)  
Jongmyeong Park (Hyundai Steel)  
Hongkil Moon (Hyundai Steel)
- PP1-098 A586 Analysis of Plastic Deformation during Straightening of Heat-treated Ball Screws**  
Jihyeon Shin (Korea Aerospace University)  
Hae-Sung Yoon (Korea Aerospace University)  
Sang Won Kim (Duckheung Co., Ltd.)
- PP1-099 A589 Improving Precipitation Behavior and Mechanical Properties of AA6061-T6 through Electrically Assisted Artificial Aging**  
Meiling Geng (University of Ulsan)  
Sung-Tae Hong (University of Ulsan)  
Lihong Cai (University of Ulsan)  
Jin-Cheol Kim (University of Ulsan)  
Van Loi Tran (University of Ulsan)
- PP1-100 A596 Effect of Heat Treatment on Crystallographic and Mechanical Properties of Electroless Nickel**  
Minwoo Jeon (Korea Basic Science Institute)  
Wonkyun Lee (Chungnam National University)  
Hwan-Jin Choi (Korea Basic Science Institute)  
Mincheol Kim (Korea Basic Science Institute)  
Woo-Jong Yeo (Korea Basic Science Institute)  
Yong-Eun Kwon (Korea Basic Science Institute)  
Hyo-Sik Kim (Korea Basic Science Institute)  
Min-Gab Bog (Y&DK)  
Young-Jae Kim (Y&DK)

- PP1-101 A597 Computer Vision-based Analysis of Brittle Fractures on Zinc Sulfide Surface and Effect on Optical Transmittance**  
Woo-Jong Yeo (Korea Basic Science Institute)  
Wonkyun Lee (Chungnam National University)  
Hwan-Jin Choi (Korea Basic Science Institute)  
Minwoo Jeon (Korea Basic Science Institute)  
Mincheol Kim (Korea Basic Science Institute)  
I Jong Kim (Korea Basic Science Institute)  
Min-Gab Bog (Y&DK)  
Young-Jae Kim (Y&DK)
- PP1-102 A599 Comparison of Nanometer Surface Roughness on Al Alloys by Diamond Turning**  
Hwanjin Choi (Korea Basic Science Institute)  
Wonkyun Lee (Chungnam National University)  
Woo-Jong Yeo (Korea Basic Science Institute)  
Minwoo Jeon (Korea Basic Science Institute)  
Mincheol Kim (Korea Basic Science Institute)  
Hyo-Sik Kim (Korea Basic Science Institute)  
Min-Gab Bog (Y&DK)  
Young-Jae Kim (Y&DK)
- PP1-103 A606 A Study on Injection Molding Process Optimization for Airless Tire Using Composite Materials**  
Unghyeon Cho (Sungkyunkwan University)  
Sang Won Lee (Sungkyunkwan University)  
Hyewon Shin (Sungkyunkwan University)  
Duju Lee (Sungkyunkwan University)  
Nahyun Kim (Sungkyunkwan University)
- PP1-104 A608 A Study on Optimization of Directed Energy Deposition Process for Multi-layered Thin Wall Structure**  
Seungwoo Paek (Sungkyunkwan University)  
Sang Won Lee (Sungkyunkwan University)  
Kyumin Kim (Sungkyunkwan University)  
Hyewon Shin (Sungkyunkwan University)
- PP1-105 A612 A Conductive rGO / PEDGA Hydrogel for Controllable Drug Delivery System**  
Yongjin Yoon (KAIST)  
Minseok Kim (KAIST)  
Jinhong Noh (KAIST)  
Insup Kim (KAIST)

## **POSTER 4**

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- PP1-106** A617 **Ultra-precision Diamond Turning of Curved Zerodur Optics Using Straight-nosed Cutting Tools with Ultrasonic Vibration Assistance**  
Yuhan Chen (Southern University of Science and Technology)  
Linhe Sun (Southern University of Science and Technology)  
Minghan Chen (Southern University of Science and Technology)  
Yongbo Wu (Southern University of Science and Technology)
- PP1-107** A625 **Laser Powder Bed Fusion Application of Pure Copper Parts Using Additive Process Prediction Technology based on DfAM**  
Woo Jong Kim (Dae Gun Tech. Co., Ltd.)  
Jae-Wook Lee (Korea Institute of Industrial Technology)  
Sung Min Kang (Dae Gun Tech. Co., Ltd.)  
Min Cheol Kang (3D Printing Research Organization)  
Goo Sang Jung (Conception Co., Ltd.)

### **3. Automation, Measurement & Control**

- PP3-036** A165 **A Study on Force Analysis of Single Diamond Tools for Elastomer Polishing Pads Used in The Diamond Dressing Process**  
Le Ngoc Quynh Hoa (Nanyang Technological University)  
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| Hao Wang            | H3-FM2 | July 20 | 14:15 | Summit Hall |
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| Jonghyun Park       | T4-FF1 | July 18 | 16:25 | Summit Hall |
| Jonghyun Ha         | W2-FH4 | July 19 | 11:10 | Summit Hall |
| Jong Woo Choi       | T4-FF3 | July 18 | 17:15 | Summit Hall |
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| Michitaka Yamamoto      | W2-FH5 | July 19 | 11:25 | Summit Hall |
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한국정밀공학회

KSPE 2023 Autumn Conference

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2023. 11/15 WED - 17 FRI | **솔비치 삼척** (강원도 삼척시)

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초록채택 통지 발송 2023. 10. 2 MON

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**Topics of the Special Issue** cover novel research contributions of "Green" precision engineering and manufacturing - theories and applications in the field of

## Advanced Manufacturing for ESG

The potential focus areas to be covered in this Special Issue include, but are not limited to:

- RE100 (Renewable Electricity 100%)
- Green Manufacturing for Aerospace and Small Modular Reactor
- Smart and Sustainable Manufacturing for Advanced Electronics
- AI-assisted Manufacturing

### Guest Editors

Professor Beomjoon Kim  
*The University of Tokyo, Japan*

Professor Sung-Tae Hong  
*University of Ulsan, Korea*

Professor Hoon-Eui Jeong  
*UNIST, Korea*

### Submission Procedures

Deadline for Submission Date  
**November 30, 2023**

Publication Date  
**May 1, 2024**

Vol., No.  
**Vol. 11, No. 3**

# JKSPE

JOURNAL OF THE KOREAN SOCIETY FOR PRECISION ENGINEERING

Indexed in SCOPUS, KCI

Launched in 1984, published 12 times in a year  
ISSN 1225-9071(Print) / 2287-8769(Online)



## INTRODUCTION

The Journal of the Korean Society for Precision Engineering (JKSPE) is a monthly, peer-reviewed, and open-access journal indexed in SCOPUS and KCI. JKSPE is devoted to publishing original research articles in the field of precision engineering and manufacturing. JKSPE recognizes outstanding contributions by presenting awards for the best papers annually (JKSPE Best Paper Awards).

## AIMS AND SCOPE

- Precision Manufacturing Processes
- Precision Measurements
- Robotics and Automation Control
- Smart Manufacturing System
- Design and Materials
- Machine Tools
- Nano/Micro Technology
- Bio Health
- Additive Manufacturing System
- Green Manufacturing Technology

## WEBSITE

<http://jkspe.kspe.or.kr>



# IJPEM-ST

INTERNATIONAL JOURNAL OF PRECISION ENGINEERING AND MANUFACTURING-SMART TECHNOLOGY

2023 New Journal

Launched in 2023, published twice in a year  
ISSN 2951-4614(Print) / 2951-6382(Online)



## INTRODUCTION

1. Full Open Access
2. Research papers, Short communications, Technical briefs, Position papers, Industry case studies

## AIMS AND SCOPE

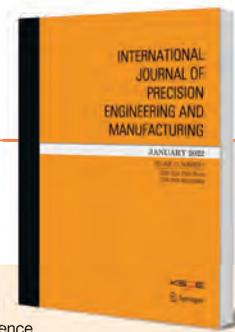
- Big Data Analytics and Informatics
- Sensors, Instrumentation and Process Monitoring
- Prognostics and Health Management (PHM)
- Industrial Internet of Things (IIOT)
- Industrial Artificial Intelligence
- Digital Twin, Cyber-Physical Systems (CPS) and Metaverse
- Augmented, Virtual and Extended Reality
- Human-Robot Interaction, Augmentation and Collaboration
- Autonomous Things

## WEBSITE

[www.ijpem-st.org](http://www.ijpem-st.org)

# IJPEM

INTERNATIONAL JOURNAL OF PRECISION ENGINEERING AND MANUFACTURING



2021 Impact Factor: 2.041

Indexed in SCIE, SCOPUS, KCI  
Launched in 2000, published 12 times in a year  
ISSN 2234-7593(Print) / 2005-4602(Online)

## INTRODUCTION

1. Regular paper, Short communication, Review paper
2. Published paper after selected outstanding paper of International Conference
3. Awards of the most downloaded and cited paper

## AIMS AND SCOPE

- Precision Manufacturing Processes
- Measurements and Control
- Robotics and Automation
- Manufacturing System
- Design and Materials
- Machine Tools
- Nano/Micro Technology
- Bio Health
- Additive Manufacturing

## SPECIAL ISSUE

**TOPIC** | 2023: Robots for Manufacturing Processes and Systems

# IJPEM-GT

INTERNATIONAL JOURNAL OF PRECISION ENGINEERING AND MANUFACTURING-GREEN TECHNOLOGY



2021 Impact Factor: 4.660

Indexed in SCIE, SCOPUS, KCI  
Launched in 2014, published bimonthly in a year  
ISSN 2288-6206(Print) / 2198-0810(Online)

## INTRODUCTION

1. Regular paper, Short communication, Review paper
2. Published paper after selected outstanding paper of International Conference
3. Awards of the most downloaded and cited paper

## AIMS AND SCOPE

- Energy Saving and Waste Reduction in Manufacturing Processes
- Manufacturing of New and Renewable Energy Devices
- Design and Manufacturing of Green Products
- Materials for Green Manufacturing
- Management and Policy for Sustainable Manufacturing

## SPECIAL ISSUE

**TOPIC** | 2016: Hybrid Manufacturing  
2017: 4D Printing  
2018: Sustainable Manufacturing in 4th Industrial Revolution  
2019: Energy Harvesting  
2020: Green Smart Manufacturing  
2021: Soft and Green Manufacturing and Applications  
2022: Green Manufacturing Coping with Climate Change and Pandemics  
2023: NetZero, Achievable by Manufacturing?  
2024: Advanced Manufacturing for ESG

# PRESM 2024

July 7 Sun – 12 Fri, 2024

Paradise Hotel Busan, Busan, Korea

## Important Dates

Deadline for Abstract Submission  
of Regular Session:

**February 1 (Thu), 2024**

Date for Acceptance Notification:  
(Mail from the PRESM Secretariat)

**April 1 (Mon), 2024**

Deadline for Early Registration/  
Presenter Registration:

**May 1 (Wed), 2024**

Full Paper Submission (Optional):

**May 31 (Fri), 2024**

## Participating Journals

1 International Journal of Precision  
Engineering and Manufacturing (IJPEM)  
\*SCIE, SCOPUS / IF 2.041 (2021)

2 International Journal of Precision  
Engineering and Manufacturing-Green  
Technology (IJPEM-GT)  
\*SCIE, SCOPUS / IF 4.660 (2021)

3 International Journal of Precision  
Engineering and Manufacturing-Smart  
Technology (IJPEM-ST)  
\*SCOPUS

4 Journal of the Korean Society for  
Precision Engineering (JKSPE)

## Awards & Honors

- Best Paper Awards
- Young Researcher Awards
- Outstanding Presentation Awards

### Organizer

 Korean Society for  
Precision Engineering (KSPE, Korea)

### Secretariat

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*International Conference on*  
**PR**recision Engineering and **S**ustainable Manufacturing

# **PRESM 2023**

**July 16** Sun – **21** Fri, 2023

**Bankoku Shinryokan,**  
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