

July 20 (Wed)

Emerald Hall (B2)

Focus session A. Smart Design and Materials

Session Chair : Prof. Jisoo Kim (Kyungpook National University)

08:30-10:50

08:30-09:00	FA1	KS02	Automated Design & Data Science Approaches for Scaled-up Additive Manufacturing Seung-Kyum Choi (Georgia Institute of Technology)
	<hr/> Keynote <hr/>		
09:00-09:30	FA2	KS07	Design of Human Oriented Mechanisms based on the Fusion of Tactile and Visual Sensation Daisuke Matsuura (Tokyo Institute of Technology)
	<hr/> Keynote <hr/>		
09:30-09:50	FA3	A418	Advances in AFM-based Characterization Techniques for Piezoelectric Materials Kwanlae Kim (Seoul National University of Science & Technology) Yijun Yang (Korea Institute of Industrial Technology) Heesung Park (Seoul National University of Science & Technology) Hyeokjun Si (Seoul National University of Science & Technology) Donghyun Lee (Seoul National University of Science & Technology) Junseo Gu (Seoul National University of Science & Technology)
09:50-10:10	FA4	A399	Synergy Effect through Convergence of Classical Mechanics and State-of-the-art Triboelectric Signal Generation Mechanism Dongwhi Choi (Kyung Hee University)
10:10-10:30	FA5	A398	Investigating Cryogenic Deformation Behaviour for Developing Nanocrystalline Titanium via Cryo-forging Tea-Sung Jun (Incheon National University) Min-Su Lee (Incheon National University) Jeong-Rim Lee (Incheon National University) Yong-Taek Hyun (Korea Institute of Materials Science)
10:30-10:50	FA6	A094	Thermophysical Properties of Eco-friendly Inorganic $MnCl_2 \cdot 4H_2O$ Phase Change Materials Kyung-Eun Min (Portland State University) Sung Yi (Portland State University) Jae-Won Jang (Portland State University) Junki Kim (Korea Institute of Industrial Technology) Cheolhee Kim (Portland State University)

Oral Presentation

Focus session B. Advanced Technology in Machine Tools & Machining

Session Chairs : Prof. Martin B.-G. Jun (Purdue University)

Dr. Jeong Seok Oh (Korea Institute of Machinery & Materials)

13:50-15:40

13:50-14:20	FB1	KS09	Smart Additive Manufacturing Chinedum E. Okwudire (University of Michigan)
	<hr/> Keynote <hr/>		
14:20-14:50	FB2	KS05	Energy-efficient Machine Tools and Technologies Sebastian Kaiser (Leibniz University Hannover) Berend Denkena (Leibniz Universität Hannover) Heinrich Klemme (Leibniz Universität Hannover)
	<hr/> Keynote <hr/>		
14:50-15:20	FB3	KS11	A Machining Digital Twin for Hybrid Manufacturing Tony Schumitz (University of Tennessee)
	<hr/> Keynote <hr/>		
15:20-15:40			Coffee Break

Oral Presentation

Session Chairs : Dr. Dong Yoon Lee (Korea Institute of Industrial Technology)

15:40-17:00

Prof. Hae-Sung Yoon (Korea Aerospace University)

15:40-16:00	FB4	A160	<p>Studying Crack Generation Mechanism of Single-crystal Sapphire during Ultra-precision Machining by MD Simulation-based Slip/fracture Activation Model</p> <p>Sangkee Min (University of Wisconsin-Madison) Suk Bum Kwon (University of Wisconsin-Madison) Aditya Nagaraj (University of Wisconsin-Madison) Dalei Xi (University of Cincinnati) Yiyang Du (University of Cincinnati) Dae Nyoungh Kim (University of Wisconsin-Madison) Woo Kyun Kim (University of Cincinnati)</p>
16:00-16:20	FB5	A074	<p>Molecular Dynamics Simulation of Ultra-precision Machining of Sapphire</p> <p>Woo Kyun Kim (University of Cincinnati) Dalei Xi (University of Cincinnati) Yiyang Du (University of Cincinnati) Aditya Nagaraj (University of Wisconsin-Madison) Suk Bum Kwon (University of Wisconsin-Madison) Sangkee Min (University of Wisconsin-Madison)</p>
16:20-16:40	FB6	A392	<p>Performance Evaluation of Multi-axis Feed Systems Using a CAE Based Dynamic Digital Twin</p> <p>Chang-Ju Kim (Korea Institute of Machinery & Materials) Dae-Hyun Kim (Korea Institute of Machinery & Materials) Chan-Young Lee (Korea Institute of Machinery & Materials) Jeong-Seok Oh (Korea Institute of Machinery & Materials)</p>
16:40-17:00	FB7	A424	<p>Machinability Diagnosis Technique in Machining Process</p> <p>Kyung-Hee Park (Korea Institute of Industrial Technology) Gi-Dong Yang (Korea Institute of Industrial Technology) Soo-Hyun Nam (Korea Institute of Industrial Technology) Jeongin Koo (Korea Institute of Industrial Technology) Jaehak Lee (Korea Institute of Industrial Technology)</p>

Oral Presentation

Focus session C. Advances in Additive Manufacturing

Session Chair : Prof. Hyun-Wook Kang (UNIST)

17:10-18:50

17:10-17:40	FC1	KS08	<p>A Data-driven Design Framework for 3D Printed Lattice Structure Optimization and Implementation</p> <p>Seung Ki Moon (Nanyang Technological University) Jerin Wesley R (Nanyang Technological University) Nicholas Poh Huat Ng (Nanyang Technological University) Joon Phil Choi (Korea Institute of Machinery & Materials)</p>
	<hr style="width: 50px; margin: 0 auto;"/>	Keynote	
17:40-18:10	FC2	KS12	<p>Nanoparticle Additives for Shape Memory Materials and Energy Devices</p> <p>Pei-Chen Su (Nanyang Technological University)</p>
	<hr style="width: 50px; margin: 0 auto;"/>	Keynote	
18:10-18:30	FC3	A339	<p>Single-digit-micron-resolution Continuous Liquid Interface Production (CLIP) 3D Print Technology</p> <p>Brian Lee (Sungkyunkwan University) Kaiwen Hsiao (Stanford University) Gabriel Lipkowitz (Stanford University) Tim Samuelsen (Stanford University) Audrey Shih (Stanford University) Joseph Desimone (Stanford University)</p>
18:30-18:50	FC4	A024	<p>A Design Trade-off Method for the Additive Manufacturing Process Chain</p> <p>David Rosen (Georgia Institute of Technology)</p>

July 21 (Thu)

Emerald Hall (B2)

Focus session D. Nano/Microtechnologies for Next Industries

Session Chairs : Prof. Munkyu Kwak (Kyungpook National University) &
Prof. Hoon-Eui Jeong (UNIST)

08:30-10:50

08:30-09:00	FD1	KS03	<p>Advance Green Manufacturing Technology for Printed Circuits Board Industry by Fully Additive Process</p> <p>Ta-Hsin Chou (Industrial Technology Research Institute (ITRI))</p>
	<u>Keynote</u>		
09:00-09:30	FD2	KS13	<p>Microneedle Sensor Technologies for Improved Healthcare: Progress & Challenges</p> <p>Kazuyoshi Tsuchiya (Tokai University)</p>
	<u>Keynote</u>		
09:30-09:50	FD3	A228	<p>A Novel Piezo-controlled Needle-free Injection System for Precise Delivery of Functional Fluids</p> <p>Mojiz Abbas Trimzi (NASEM Co., Ltd.) Young-Bog Ham (Korea Institute of Machinery & Materials) Jinyoung Choi (NASEM Co., Ltd.)</p>
09:50-10:10	FD4	A403	<p>Recent Developments in Manufacturing Tribology</p> <p>Steven Schmid (University of North Carolina at Charlotte)</p>
10:10-10:30	FD5	A291	<p>Self-assembled Smart Scaffold for Endovascular Disease Diagnosis</p> <p>Dong-Su Kim (Chonnam National University) Dong-Weon Lee (Chonnam National University) Yun-Jin Jeong (Chonnam National University) Nomin-Erdene Oyunbaatar (Chonnam National University)</p>
10:30-10:50	FD6	A023	<p>Experimental Study on the Magnetic and Mechanical Properties of Laser Selective Melted FeSiCr Soft Magnetic Composite</p> <p>Chunhui Chung (National Cheng Kung University) Kuan-Di Jiang (National Cheng Kung University) Lien-Kai Chang (National Cheng Kung University) Tsung-Wei Chang (National Cheng Kung University) Yu-Ming Xu (National Cheng Kung University) Mi-Ching Tsai (National Cheng Kung University)</p>

Oral Presentation

Focus session E. Hot Issues on Precision Metrology

Session Chair : Dr. Jonghan Jin (Korea Research Institute of Standards & Science)

13:50-15:40

13:50-14:20	FE1	KS06	<p>Optical Metrology for Extremely Large Space Telescopes beyond James Webb Space Telescope</p> <p>Daewook Kim (University of Arizona)</p>
	<u>Keynote</u>		
14:20-14:40	FE2	A402	<p>Optical Method for Simultaneous Measurement of Individual Layer Thicknesses in Thin-film Deposited Samples</p> <p>Jungjae Park (Korea Research Institute of Standards & Science) Jonghan Jin (Korea Research Institute of Standards & Science) Jaeseok Bae (METERLAB Co., Ltd.)</p>
14:40-15:00	FE3	A386	<p>On-machine Surface Profiling of Precision Lens Molds Using a Radial Shearing Interferometer</p> <p>Joo Hyung Lee (Seoul National University of Science & Technology) Quang Huy Vu (Seoul National University of Science & Technology) Tien Dung Vu (Hanoi University of Science & Technology) Seung Hoo Lee (Seoul National University of Science & Technology)</p>
15:00-15:20	FE4	A407	<p>All Fiber Distance Measurement System towards On-chip LiDAR Engine</p> <p>Yoon-Soo Jang (Korea Research Institute of Standards & Science)</p>
15:20-15:40	FE5	A400	<p>Ultrathin Insect-eye Camera for High-contrast Visible and Near-infrared Imaging</p> <p>Kisoo Kim (Korea Photonics Technology Institute)</p>

Focus session F. Korea-Germany Intelligent Manufacturing System

Session Chairs : Prof. Sung-Hoon Ahn & Dr. Ji-Ho Jeon (Seoul National University)

16:00-17:50

16:00-16:30	FF1	KS01	<p>Digital Twins for Sustainable Manufacturing Matthias Brockmann (University of Applied Sciences FH Münster)</p>
	<u>Keynote</u>		
16:30-16:50	FF2	A301	<p>Towards Nanostructures -Potentials of Artificial Intelligence for Large Area Diamond Turning of Micro- and Nanostructures Maximilian Kosel (Fraunhofer Institute for Production Technology)</p>
16:50-17:10	FF3	A414	<p>Future Perspectives towards Faster Development of Active Assembly Solutions for Next Generation of Industrial Applications Daniel Zontar (Fraunhofer Institute for Production Technology) Maximilian Hoeren (Fraunhofer Institute for Production Technology) Christian Brecher (RWTH Aachen University)</p>
17:10-17:30	FF4	A336	<p>Stochastic Physics-based Model Updating Using Lamb Waves for Fatigue Crack Detection in Riveted Lap Joints Wongon Kim (Seoul National University) Byeng Dong Youn (Seoul National University)</p>
17:30-17:50	FF5	A382	<p>NO₂ Gas Monitoring in Factory Using Low Power Consumption Gas Sensing System based on Colorimetric Gas Sensor Young-Gyun Kim (Seoul National University) Sung-Hoon Ahn (Seoul National University) Daeseob Song (Seoul National University) Guyeop Jung (Seoul National University) Jungwoo Park (Seoul National University)</p>

Oral Presentation

July 22 (Fri)

Emerald Hall (B2)

Focus session G. Robotic Machining and Next Generation Manufacturing

Session Chair : Dr. Tae-Gon Kim (Korea Institute of Industrial Technology)

08:30-11:00

08:30-09:00	FG1	KS10	<p>Discontinuity Formation and Detection during Friction Stir Welding of Aluminum Alloys</p> <p>Frank Pfefferkorn (University of Wisconsin-Madison) Mohammad Ali Ansari (University of Wisconsin-Madison) Daniel Franke (University of Wisconsin-Madison) Michael Zinn (University of Wisconsin-Madison) Shiva Rudraraju (University of Wisconsin-Madison)</p>
	<u>Keynote</u>		
09:00-09:20	FG2	A380	<p>Deflection Compensation of Robotic Milling with Cutting Force Estimation and Identification Error Reduction</p> <p>Jihyun Lee (University of Calgary) Ali Khishtan (University of Calgary) Zhanhao Wang (University of Calgary)</p>
09:20-09:40	FG3	A027	<p>Cutting Force, Temperature, Tool Wear and Machined Surface Alteration in Micro-milling of Laser-melting Ti-6Al-4V / Ti Composites</p> <p>Chunliang Kuo (National Taiwan University of Science & Technology) Pinxian Ye (National Taiwan University of Science & Technology) Shiyu Jiang (National Taiwan University of Science & Technology)</p>
09:40-10:00	FG4	A396	<p>Pre-compensation of Hole Positioning Error in Robotic Drilling Process</p> <p>Seong Hyeon Kim (Korea Institute of Industrial Technology) Jinho Lee (Korea Institute of Industrial Technology) Jungsoo Nam (Korea Institute of Industrial Technology) Tae-Gon Kim (Korea Institute of Industrial Technology) Seok-Woo Lee (Korea Institute of Industrial Technology)</p>

Oral Presentation

10:00-10:20	FG5	A397	On Developing Core Technologies of Serial-structure Flexible Machine for Metal Cutting Applications Jongyoup Shim (Korea Institute of Machinery & Materials) Jooho Hwang (Korea Institute of Machinery & Materials) Seung-Guk Baek (Korea Institute of Machinery & Materials) Dang-Chi Cong (Korea Institute of Machinery & Materials) Seung-Kook Ro (Korea Institute of Machinery & Materials)
10:20-10:40	FG6	A051	On-machine, In-process Strobe-stereoscopy for Spatially Resolved 3D Surface Profiling of Rotating Part Chabum Lee (Texas A&M University) Xiangyu Guo (Texas A&M University) Jungsub Kim (Texas A&M University)
10:40-11:00	FG7	A289	Effect of Fiber-tool Contact Mode on Carbon Fiber Reinforced Plastic Milling Tool Wear Gyuho Kim (Yonsei University) Byung-Kwon Min (Yonsei University) Hyunho Jo (Yonsei University)

Oral Presentation

Focus session H. Digital Twin for Smart Manufacturing

Session Chair : Dr. Jungsoo Nam (Korea Institute of Industrial Technology)

13:50-15:40

13:50-14:20	FH1	KS04	<p>Augmented Reality in Human Cyber-Physical Systems toward Intelligent Manufacturing Chih-Hsing Chu (National Tsing Hua University)</p>
	<u>Keynote</u>		
14:20-14:40	FH2	A428	<p>Industrial Digital Twin for Smart Manufacturing: A Case Study on Robotic Welding System Sang Won Lee (Sungkyunkwan University)</p>
14:40-15:00	FH3	A354	<p>Digital Twin Based Process Monitoring Framework and AI-powered Process Planning Martin B.-G. Jun (Purdue University) Xingyu Fu (Purdue University) Sangje Cho (Purdue University) Ragu Athinarayanan (Purdue University)</p>
15:00-15:20	FH4	A007	<p>Parameter Optimization and Cycle Time Estimation Using CNC Machine Tool Simulation Chan-Young Lee (Korea Institute of Machinery & Materials) Seung-Kook Ro (Korea Institute of Machinery & Materials) Chang Kyu Song (Korea Institute of Machinery & Materials) Jeong Seok Oh (Korea Institute of Machinery & Materials) Soon-Hong Hwang (Yonsei University) Byung-Kwon Min (Yonsei University)</p>
15:20-15:40	FH5	A321	<p>The Tool Life Simulation based on a Digital Twin Model in the Milling Process Dongmin Kim (Korea Institute of Industrial Technology) Hyung Wook Park (UNIST) Sangmin Yang (UNIST) Dongchan Kim (UNIST)</p>