



ASPEN2022

November 15 to 18, 2022
Singapore

Day 1 - 16th November 2022, Wednesday

Time	Programme				
	Auditorium				
09:00-09:20	Opening Address				
	Session Chair: Dr Wang Hao				
09:20-10:00	Keynote Session 1				
	Advanced Technologies for Automation system Dr Makoto Fujishima				
10:00-10:15	Tea Beak @ Function Hall 1				
	Additive Manufacturing 1	Automation, Mechatronics and Robotics I	Micro/Nano Fabrication Process I	High Speed & Precision / Non-traditional Machining I	Molding and Forming Technology & Precision Machine Design
	Auditorium	Lecture Room 1 @ L2	Lecture Room 2 @ L2	Lecture Room 5 @ L3	Lecture Room 6 @ L3
	Session Chair: Dr Wang Pan	Session Chair: Prof Lum Guo Zhan	Session Chair: Prof Yoshitaka Nakanishi	Session Chair: Prof Bo Hyun Kim	Session Chair: Prof Ming Wang Fu
10:15-10:30	Implicit Design of Shell-based Lattices Manufactured by Micro Selective Laser Melting Process Invited Speaker Prof Xu Song Chinese University of Hong Kong (Virtual)	Magnetic miniature actuators with six-DOF multimodal soft-bodied locomotion Invited Speaker Prof Lum Guo Zhan Nanyang Technological University, Singapore	3-dimensional Surface Processing through Elimination by Mechanical Removing OR-12-0014 Prof Yoshitaka Nakanishi Kumamoto University	Machining of micro lens arrays by a dynamic rotating-tool diamond turning system Invited speaker Prof Xinquan Zhang Shanghai Jiao Tong University (Virtual)	Progressive forming of bulk microparts by directly using sheet-metals: Issues and challenges Invited Speaker Prof Ming Wang Fu Hong Kong Polytechnic University
10:30-10:45			Fabrication of Optical Surfaces on Polymethyl Methacrylate by Ultra-precision Diamond Turning OR-12-0018 Mr Makitoshi Shimizu Keio University		
10:45-11:00	Seamless integration of AM Digital Twin with CAD/CAM software for large-format 3D printing of metals OR-01-0132 Dr Jakub Mikula IHPC, A*STAR	Gesture Selection Strategy of Reconfigurable Soft Gripper System using a Data-Driven Scheme OR-02-0047 Dr Yangfan Li IHPC, A*STAR	Generation of Micro Lenslet Arrays using High Efficiency Synchronized Diamond Milling OR-12-0064 Dr Tan Yew Jin Nicholas SIMTech, A*STAR	Parametric Model and Optimization Conditions in High-frequency Ultrasonic Vibration-assisted Turning of Optical Spherical Convex Mold OR-07-0157 Dr Xiaoliang Liang The Hong Kong Polytechnic University (Virtual)	IR-Thermoforming Window Design via a Thermal Approach: For CFRTP and Hybrid Thermoplastic Composites OR-13-0026 Ms Yi Wen Cheah SIMTech, A*STAR
11:00-11:15	Topology Optimization of Free Form Stiffener Built by Cold Spray Additive Manufacturing OR-01-0162 Mr Zhi-Qian Zhang IHPC, A*STAR	Dual Arm Manipulation Strategy for Tight Space Manipulation OR-02-0154 Ms Audelia Gumarus Dharmawan Singapore University of Technology and Design	Surface Micromachining by Micro Slurry-jet and Masking Process OR-12-0088 Mr Yutaro Doi Kumamoto University	A Novel Calibration Method of Angular Misalignment in FTS-Based Diamond Turning OR-07-0004 Mr Shigeru Tanikawa Keio University	Supercritical CO2 Foaming of Polypropylene Nanocomposites: Surfactant and Reinforcing Effects of Silsesquioxane-based Hybrid Janus Molecules OR-13-0028 Mr Keen Hoe Ho SIMTech, A*STAR
11:15-11:30	Study on Wire and Arc Additive Manufacturing of Metals Using Image Processing and Reinforcement Learning OR-01-0279 Mr Po-Wei Pan National Tsing Hua University	Development of a Pneumatic Module for Reconfigurable Soft Robots OR-02-0277 Dr Yuzhe Wang SIMTech, A*STAR	Factoring Surface Area for Mechanochemical Effects During Micro-scratching OR-12-0093 Dr Lionel Lee National University of Singapore	Experimental and Numerical Study on High Speed Impact Trimming(HSIT) Process for UHSS Sheets OR-07-0012 Mr Jae-Hyuk Lim Sungkyunkwan University	Influences of Bend Severity, Tool Shape, Forming Wall Angle, and Stepdown Size on Pillow Defect of Stainless steel Sheets in Single Point Incremental Forming OR-13-0072 Mr Kristian Tan SIMTech, A*STAR
11:30-11:45	Review on the use of machine learning techniques to optimise the processing of copper alloys in additive manufacturing OR-01-0297 Mr Yanting Liu National University of Singapore	Hybrid Electromagnetic Actuator with a Dual Rotor Configuration OR-02-0284 Dr Jonathan Hey SIMTech, A*STAR	Development of a Single Crystal Tool for Ferrous Based Optics OR-12-0101 Mr Amit Dodmani IIT Madras	Aspects of Spindle Balancing and Consequences on Ultra-precision Machining OR-07-0059 Dr Byron Knapp Professional Instruments Company	Advanced Hybrid Joining for Needle-punched rCF Composite-Metal Structures via Compression Moulding Process OR-13-0178 Dr Chen Wang SIMTech, A*STAR
11:45-12:00	Characterization of Two-photon Photopolymerization Fabrication using High-speed Optical Diffraction Tomography OR-01-0150 Dr Shih-Chi Chen The Chinese University of Hong Kong	Control Boost of An Active Magnetic Bearing System with Dobs OR-02-0002 Prof Hyeong Joon Ahn Soongsil University (Virtual)	Development of a Novel Vibration-assisted Ultraprecision Cutting System for Fabricating Hierarchical Ratio Micro/Nanostructures OR-12-0153 Dr Hanheng Du The Hong Kong Polytechnic University (Virtual)	Dynamics and Surface Quality Analysis in Robotic Milling OR-14-0167 Ms Yuxuan Zhao Nanyang Technological University	Predicting 2D Data: Using conditional Generative Adversarial Networks in Incremental Sheet Forming OR-08-0053 Mr Darren Low National University of Singapore
12:00-12:15	Signal Error Correction of a Magnetic Encoder OR-16-0137 Mr Zih-Hao You National Tsing Hua University	Trade-off Between Resolution and Response Time of Frequency-Modulated (FM) Eddy Current Displacement Sensor for Active Magnetic Bearing (AMB) OR-02-0030 Prof Hyeong Joon Ahn Soongsil University (Virtual)	Study on High Performance Machining Optical Surface and Its Post-treatment Strategy by Active Fluid Jet Polishing OR-12-0067 Dr Zexiao Li Tianjin University (Virtual)	Micro Mechanical Machining of Cemented Carbide using PCD Tools OR-14-0278 Prof Bo Hyun Kim Soongsil University	Analysis of Spatial Motion Static and Dynamic Performance of Gantry Type Large Machine Tools OR-16-0043 Dr Tzu-Chi Chan National Formosa University
12:15-13:15	Lunch @ Function Hall 1				



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	Keynote 2	Keynote 3	Keynote 4		
	Auditorium	Lecture Room 1 @ L2	Lecture Room 2 @ L2	Lecture Room 5 @ L3	Lecture Room 6 @ L3
	Session Chair: Dr Wang Hao	Session Chair: Dr Liu Kui	Session Chair: Dr Sharon Nai		
13:15-13:55	Keynote Session Additive Manufacturing Process Chains: Product-Process Co-Design Challenges and Opportunities Prof David Rosen	Keynote Session Intermolecular/Surface Forces and Atomic-scale Manufacturing Professor Yu Tian (Virtual)	Keynote Session Ultrafast Nanoscale 3D Printing Based on Digital Holography & Temporal Focusing Professor Shih-Chi Chen		
	Additive Manufacturing II	Automation, Mechatronics and Robotics II	Micro/Nano Fabrication Process II	High Speed & Precision / Non-traditional Machining II	Digital & IoT / AI / Big Data in Manufacturing I
	Auditorium	Lecture Room 1 @ L2	Lecture Room 2 @ L2	Lecture Room 5 @ L3	Lecture Room 6 @ L3
	Session Chair: Prof Christopher Hutchinson	Session Chair: Dr Zhu Haiyue	Session Chair: Prof Hirofumi Suzuki	Session Chair: Dr Zhen-Pei Wang	Session Chair: Dr Long Bin Tan
13:55-14:10	Laser Powder Bed Fusion of Mixed Powders OR-01-0228 Invited Speaker Prof Christopher Hutchinson Monash University	Digital Twin-based Object Detection of Camera Mounted Robot Arm using Deep Reinforcement Learning OR-02-0083 Mr Su-Young Park Seoul National University	Study on the Ultra-precision Machining of Polycrystalline Tin OR-12-0192 Prof Min Lai Tianjin University (Virtual)	Ultra-precision polishing technology for microstructured surfaces Invited Speaker Prof Jiang Guo Dalian University of Technology (Virtual)	A Machine Learning Approach to Defect Detection and Failure Analysis in Composites OR-08-0052 Dr Long Bin Tan IHPC, A*STAR
14:10-14:25		Inverse Kinematics Selection Algorithm for 6-DOF Manipulator Based on Neural Network to Pass Through the Singular Point OR-02-0123 Mr Daiki Kato Doshisha University	Improving the Machinability of Brittle Materials by Ion Implantation OR-12-0108 Dr Jinshi Wang Tianjin University (Virtual)		Non-contact Equipment Fault Detection Using Audio and Magnetic Sensors OR-08-0275 Dr Zhimin Yuan IloT, A*STAR
14:25-14:40	Metrology Applications in in-situ Process Monitoring of Additive Manufacturing OR-01-0034 Invited Speaker Dr Baoxi Xu National Metrology Centre, A*STAR (Virtual)	Investigating Quantum Reinforcement Learning Structure to The Cartpole Control Task OR-02-0142 Mr Nguyen Truong Thu Ngo The University of Adelaide	A New Method for V-groove Microstructured Surface Polishing using Non-Newtonian Fluids OR-12-0292 Mr Pengfei Zhang Dalian University of Technology (Virtual)	Some Numerical Aspects in Simulating Pad Conditioning Coverage and Density for Long Time Conditioning Process OR-07-0020 Dr Zhen-Pei Wang IHPC, A*STAR	Prediction of Drug Permeation Through Human Skin Treated with Microneedles Using Machine Learning Methods OR-08-0147 Dr Lifeng Kang University of Sydney
14:40-14:55		Joint-based model using centre of pressure and muscle movement for motion attempt detection of lower-limb exoskeleton OR-02-0156 Mr Nguyen Truong Thu Ngo The University of Adelaide	Hot Filament Chemical Vapour Deposition on Tungsten Carbide Tools with Magnetic Field Assistance OR-12-0219 Mr Fung Ming Kwok The Hong Kong Polytechnic University (Virtual)	Controller Design for Piezo-driven Segmented Fast Steering Mirror OR-07-0179 Ms Rina Nishida Tokyo Institute of Technology	Digital Twin-based Cutting Tool Breakage Detection Model using Synthetic Depth Map and Deep Learning OR-08-0218 Mr Suhwan Jeong Seoul National University
14:55-15:10	Influence of TiC Reinforcement Particles on the Mechanical Properties and Microstructures of Heat-Treated IN718 Composite OR-01-0107 Dr Duy Nghia Luu SIMTech, A*STAR	Segmentation for Grasping: An Approach toward Autonomous Table Clearing OR-02-0186 Dr Zhu Haiyue SIMTech, A*STAR	Numerical simulation of glass rolling process for cylindrical lens array OR-14-0021 Dr Kangsen Li The Hong Kong Polytechnic University (Virtual)	Optimization of Hopkinson Bar Structure for Measuring Discharge Reaction Force in WEDM OR-14-0149 Ms Wenting Gu Shanghai Jiao Tong University & The University of Tokyo	Predictive Analytics for Downtime Prevention in Plastic Injection Molding Line OR-08-0273 Mr Juntong Chan SIMTech, A*STAR
15:10-15:25	Laser Powder Bed Fusion of Grain Refined 316L Stainless Steel Through Ti in-situ Alloying OR-01-0269 Mr Wengang Zhai Nanyang Technological University	Intelligent 6-DoF Robotic Grasping and Manipulation System Using Deep Learning OR-02-0217 Dr Zhu Haiyue SIMTech, A*STAR	Aspheric Cutting of CVD-SiC Molds by PCD Milling Tool OR-12-0300 Prof Hirofumi Suzuki Chubu University	The Effects of the Temperature on the Ultrasonic Transducers OR-14-0196 Mr Minki Choo Yeungnam University	Development of Artificial Intelligence for Assessing Microprocess Plans and Metadata Models Based on ISO 14649 Using the Unified HMI Platform OR-08-0271 Ms Shokhikha Amalana Murdivien Kyung Hee University
15:25-15:40	The Development of an Effective and Comprehensive Modeling Technique for Thermomechanical Analysis of Selective Laser Melting Process OR-01-0090 Mr Nitesh Anand National Tsing Hua University	Investigation to Enhance the Actuation Force Transmission of Cable-Driven Continuum Manipulators with Tethering Lines OR-02-0208 Mr Landong Martua Singapore Institute of Technology	Study on the Spinnable Carbon Nanotube Arrays Prepared by Chemical Vapor Deposition OR-12-0205 Mr Cheng-I Chang National Tsing Hua University	Development of Ultrasonic Transducer with Flexure Hinge for Ultrasonic Spindle Milling OR-14-0213 Dr Rendu Kurniawan Yeungnam University	Big Data and Artificial Intelligence (AI) Driven Dental Prostheses Design OR-08-0183 Dr Hao Ding The University of Hong Kong (Virtual)
15:40-15:55	206 nm All-solid-state Deep-ultraviolet Laser for Additive Manufacturing OR-15-0239 Mr Qian Dong Ran SIMTech, A*STAR	Investigation on the Process Parameters of an Automated Wall Grinding Robotic System OR-02-0212 Mr Landong Martua Singapore Institute of Technology	Investigation on the Characteristic of Plasma Deep Etching in Wafer Cutting Industry OR-12-0302 Mr Kuan-Yu Lin Mechanical and Mechatronics System Research Laboratories/Industrial Technology Research Institute	An Impact-based Automatic Centering Actuator System for Ultra-Precision Turning OR-16-0312 Dr Seung-Kook Ro Korea Institute of Machinery and Materials	A Deep Learning Based Quality Monitoring System for Injection Moulding Process OR-08-0317 Dr Ngoc Chi Nam Doan SIMTech, A*STAR (Virtual)
15:55-16:10	Tea Break @ Function Hall 1				



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	Additive Manufacturing III	Automation, Mechatronics and Robotics III	Micro/Nano Fabrication Process III	High Speed & Precision / Non-traditional Machining III	Digital & IoT / AI / Big Data in Manufacturing II
	Auditorium	Lecture Room 1 @ L2	Lecture Room 2 @ L2	Lecture Room 5 @ L3	Lecture Room 6 @ L3
	Session Chair: Dr Jakob Mikula	Session Chair: Dr Sreekanth Kana	Session Chair: Dr Xincui Wang	Session Chair: Dr Sho Itoh	Session Chair: Dr Jing Zhuang
16:10-16:25	Transient processes and defect control for additive manufacturing of metallic materials Invited Speaker Prof Huiliang Wei Nanjing University of Science and Technology (Unknown)	Autonomous Cooperative Operation Between Industrial Cooperative Humanoid Robot and An Electric Passive Balancer OR-02-0010 Mr Hiroaki Hanai Doshisha University	Fine Magnetic Pattern Transferred on Nd-Fe-B Magnets Using High Heat-resistant Nd-Fe-B Magnets OR-10-0104 Mr Keita Nagai Tokyo Institute of Technology	A Hybrid Finishing and Figuring Process Using Atmosphere Plasma for Optical Manufacturing Invited Speaker Prof Hui Deng Southern University of Science and Technology (Virtual)	Bas-relief Modeling Combining Multiple Range Data Based on Poisson Equation OR-05-0282 Mr Takumi Kimura Tokyo Metropolitan University
16:25-16:40		Design of a Leg Mechanism with Suction Devices for a Hexapod Mobile Robot Moving Around Multiple Environments OR-02-0019 Ms Ami Matsuura Muroran Institute of Technology	Laser Micro/Nano Surface Texturing of SS316L for Superhydrophobicity OR-12-0065 Dr Xincui Wang SIMTech, A*STAR		Automated Knowledge Extraction for Smart Cognitive Machine Tool HMI OR-05-0222 Mr JongSu Park Kyung Hee University
16:40-16:55	Increasing the Productivity in Selective Laser Melting with Large Layer Thickness and Dual Laser for Ti-6Al-4V OR-01-0054 Dr Chen-Nan Sun SIMTech, A*STAR	Impedance-controlled Teleoperation with Haptic Feedback for Robotic Manipulation OR-02-0118 Dr Sreekanth Kana Nanyang Technological University	Vertical nanogap arrays assembled from nanoentities for highly sensitive biochemical detection OR-03-0235 Dr Kwanoh Kim Korea Institute	Machining property by ultra fine bubble coolant OR-07-0122 Prof Manabu Iwai Toyama Prefectural University (Virtual)	Few-Shot Learning for Prescriptive Maintenance OR-08-0094 Dr Yang Zhao SIMTech, A*STAR
16:55-17:10	Binder Jet 3D Printing of Complex Porous Molds for Thermoforming OR-01-0250 Dr YanHan Liew SIMTech, A*STAR	An Add-On Pose Measurement Device for Rapid Robot Programming OR-02-0131 Dr Wei Lin SIMTech, A*STAR	Study on the Nanoscale Tribological Characteristics of Thin Film Coatings OR-18-0169 Mr Young Chan Jung Yonsei University	Surface Integrity in High Spindle Speed Grinding of Al/SiCp Metal Matrix Composites OR-07-0191 Mr Sai Guo State Key Laboratory of Ultra-precision Machining Technology & Hong Kong Polytechnic University (Virtual)	Digital Twin Smart Home Using Robust Mat Monitoring System with Multi-Modality Deep Learning Analysis OR-08-0099 Ms Yanqin Yang National University of Singapore
17:10-17:25	Investigation of Pre-thermal treatment and Surface Modification of Fine Metal Powder Feedstock on the Flowability and Agglomeration Behaviors for Binder Jetting Process OR-01-0057 Ms Jiemin Huang SIMTech, A*STAR	Development of Ultra-Small Fast Steering Mirror for Spectroscopic Sensor with High Speed and Excellent Disturbance Rejection Characteristics OR-02-0133 Dr Ho-Sang Kim Institute for Advanced Engineering	Towards Atomic-scale Smooth β -Ga ₂ O ₃ Surfaces Manufacturing via Atmospheric Pressure Inductively Coupled Plasma OR-12-0007 Mr Yongjie Zhang Southern University of Science and Technology (Virtual)	Selective Stress Relaxation of Chemically Strengthened Glass for Mechanical Cutting by Reverse Ion-exchange using Electrochemical Discharge (ECD) Processing OR-14-0258 Prof Jihong Hwang Seoul National University of Science and Technology	AI-enhanced Multifunctional Haptic Rings for Cross-space Perception and Sensation in Metaverse OR-08-0102 Mr Zhongda Sun National University of Singapore
17:25-17:40	Characterisation of NdFeB Magnet Powder Used for Laser Powder Bed Fusion OR-01-0314 Mr Yong Rong Chan ARTC, A*STAR	Automatic Loading Algorithm via Vision-based Payload Volume Estimation OR-02-0280 Mr Jaewon Kwak Korea University	A Large-scale Nanomachining System Established Based on AFM Contact Mode OR-12-0080 Dr Jiqiang Wang Harbin Institute of Technology (Virtual)	Anisotropy in Ultra-precision Machinability of Additively Manufactured Inconel 718 Alloys OR-14-0078 Dr Yuchao Bai National University of Singapore	A Case Study: Dynamic Dispatching Framework for Multi-Product Production System via Reinforcement Learning Approach OR-08-0197 Dr Jing Zhuang SIMTech, A*STAR
17:40-17:55	Quality of Additively Manufactured As-built 17-4 PH Parts with Respect to Process Conditions and Moisture Contents OR-01-0188 Mr Taehwan Kim Sungkyunkwan University	Multi-axis Synchronous Control of Pneumatic Cylinder for Reliability Tester OR-02-0286 Mr Beomsik Sim Chungnam National University	Exploration of Optimate Surface Roughness of Plasma-Based Atom-Selective Etching Process for Single-Crystal Silicon OR-12-0006 Mr Bing Wu Southern University of Science and Technology (Virtual)	Feasibility Study on Laser Fusion Cutting of Ultra-thin Glass (UTG) Aimed for Defect-free, Molten Edge Formation OR-14-0040 Dr Sho Itoh Chiba University	Cloud-based Data Analytics Framework for Real-time Lift Monitoring and Diagnostic System OR-08-0267 Dr Duc-Minh Pham SIMTech, A*STAR
17:55-18:10	Towards Effective Powder Reuse in "Large Format Laser Aided Additive Manufacturing" (LAAM) OR-06-0086 Dr Sandor Nemeth Singapore Institute of Manufacturing Technology	Inverse Dynamics of Cable-driven 2D Serial Linkage OR-02-0193 Ms Yejin Yu Seoul National University	Laser-Induced Metallization for Fabrication of Circuits on the 3D Surface of Devices OR-12-0301 Dr Ta-Hsin Chou Industrial Technology Research Institute (Virtual)	Magnetic Field Dependent Machinability in Ultra-precision Machining of Single-crystal Copper OR-14-0060 Mr Yunfa Guo National University of Singapore (Virtual)	Text Mining Framework for Predictive Maintenance in Manufacturing OR-08-0264 Dr Duc-Minh Pham SIMTech, A*STAR
18:10-18:25	Effect of Melt Pool and Particle Dynamics on As-built Qualities in Laser Powder Bed Fusion Process OR-01-0041 Mr Min-Kyeom Kim Sungkyunkwan University	Intelligent Depalletizing System Utilizing 3D Image Recognition and Industrial Robot for Camshaft OR-02-0234 Mr Qiming Zhong Department of Mechanical and Electrical Engineering, School of Aeronautics and Astronautics, Xiamen University (Virtual)	DUV optical microscopy for measuring high-aspect-ratio sub-micron structures OR-11-0032 Mr Zih-Ying Fu National Taiwan University	Investigation of Segment Turning Process Based on Single-Amplitude-Frequency Criterion for Complicated Multi-Scale Surface Structure OR-07-0168 Mr Xiao Lu The Hong Kong Polytechnic University (Virtual)	Hybrid composites with integrated metallic connectors: the effects of insert geometry on the mechanical performance of composite structures OR-13-0027 Mr Le Quan Ngoo Tran A*STAR SIMTech
18:30-21:00	Young Researchers' Night @ Orchid Function Hall				