

NAMRC TECHNICAL SESSIONS-TUESDAY

Track 1: MS Sessions	Track 2: MP Sessions	Track 3: MR Sessions	Track 4: AM Sessions	Track 5: SM&CPS Sessions	Track 6: IA&ME Sessions	Student Competition
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Tuesday, June 28,2022 Start: 09:10 K_G23		NAMRC - STUDENT COMPETITION - Session 1 Session Chair: Dhruv Bhate (Arizona State) Session Co-Chair: Sarah J. Wolff (Texas A&M)	
Paper 47	A Critical Assessment of the Archimedes Density Method for Thin-wall Specimens in Laser Powder Bed Fusion: Measurement Capability, Process Sensitivity and Property Correlation	Daniel Bruce, Paul Paradise, Anushree Saxena, Samuel Temes, Ryan Clark, Cameron Noe, Mark Benedict, Thomas Broderick and Dhruv Bhate	
Paper 71	Four Rs Framework for the Development of a Digital Twin: The Implementation of Representation with a FDM Manufacturing Machine	John Osho, Anna Hyre, Minas Pantelidakis, Allison Ledford, Gregory Harris, Jia Liu and Konstantinos Mykoniatis	
Paper 93	Cracking suppression in additive manufacturing of hard-to-weld nickel-based superalloy through layer-wise ultrasonic impact peening	Yachao Wang, Sougata Roy, Hyunsuk Choi and Md Touhidul Rimon	

Tuesday, June 28,2022 Start: 09:10 R1086		NAMRC - TRACK 1 MANUFACTURING SYSTEMS - Session 1 Session Chair: Shaopeng Liu (General Electric) Session Co-Chair: Vladimir Gurau (Georgia Southern U.)	
Keynote	Digital Twin-Enabled Smart Manufacturing System for Prefabrication Construction Using Big Data Analytics	Ray Y. Zhong, The University of Hong Kong	
Paper 74	Robotic Manufacturing System for Unattended Machining and Inspection of Graphite Bipolar Flow Field Plates for Proton Exchange Membrane Fuel Cells	Vladimir Gurau and Ryan Kent	

Tuesday, June 28,2022 Start: 09:10 R2070		NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 1 Session Chair: Ihab Ragai (Penn State) Session Co-Chair: Amr Salem (OntarioTech)	
Keynote	The Role of Machine Learning in Manufacturing	Jian Cao, Northwestern University	
Paper 64	Multi-Objective Optimization and Innovization-based Knowledge Discovery of Sustainable Machining Process	Amr Salem, Hussien Hegab, Shahryar Rahnamayan and Hossam Kishawy	

Tuesday, June 28,2022 Start: 09:10 R1075		NAMRC - TRACK 3 MATERIAL REMOVAL - Session 1 Session Chair: Brad Kinsey (U. New Hampshire) Session Co-Chair: Sangkee Min (U. Wisconsin-Madison)	
Paper 20	Investigation of advantages to water droplet machining over abrasive waterjet cutting of carbon fiber reinforced polymer	Benjamin Mitchell, Ahmad Sadek and Brad Kinsey	
Paper 30	Characteristics of force generation on C-, R-, A- and M- planes of single-crystal sapphire during ultra-precision machining	Suk Bum Kwon and Sangkee Min	

Tuesday, June 28,2022 Start: 09:10 R1011		NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 1 Session Chair: Yuebin Guo (Rutgers) Session Co-chair: Chenang Liu (Oklahoma State)	
Paper 51	Parametric Optimization of Corner Radius in Hexagonal Honeycombs under In-plane Compression	Athul Rajeev, Alex Grishin, Varun Agrawal, Bharath Santhanam, Derek Goss, Sridhar Niverty, Grace Cope, Clint Penick, Nikhilesh Chawla, Vikram Shyam, Ezra McNichols and Dhruv Bhate	
Paper 146	When AI Meets Additive Manufacturing: Challenges and Emerging Opportunities for Human-Centered Products Development	Chenang Liu, Wenmeng Tian and Chen Kan	
Paper 57	Data Organization in Laser-based Powder Bed Fusion for Metals	Shaw Feng, Shengyen Li, Mostafa Yakout and Albert Jones	

Tuesday, June 28,2022 Start: 13:00 K_G23		NAMRC - STUDENT COMPETITION - Session 2 Session Chair: Peng Wang (U. Kentucky) Session Co-chair: Hongseok Choi (Clemson)
Paper 132	Study of Surface Wettability on Fused Silica by Ultrafast Laser-induced Micro/Nano-Surface Structures	Kewei Li, Nathaniel Myers, Grant Bishop and Xin Zhao
Paper 137	Modulation-assisted machining of compacted graphite iron with coated carbide tool in dry condition	Juan Sandoval, Aaqib Ali, Patrick Kwon and Yang Guo
Paper 113	Investigating the Effects of SiC Abrasive Particles on Friction Element Welding	Gaurav Awate, Nikhil Mahajan and Hongseok Choi
Tuesday, June 28,2022 Start: 13:00 R1011		NAMRC - TRACK 1 MANUFACTURING SYSTEMS - Session 2 Session Chair: Yuan-Shin Lee (NCSU) Session Co-chair: Youlin Huang (U. Kentucky)
Paper 135	Streaming Machine Generated Data via the MQTT Sparkplug B Protocol for Smart Factory Operations	Pavel Korpov, Ashwin Ramachandran, Paul Cohen, Yuan-Shin Lee and Binil Starly
Paper 72	Self-optimizing thermal error compensation models with adaptive inputs using Group-LASSO for ARX-models	Nico Zimmermann, Tobias Büchi, Josef Mayr and Konrad Wegener
Paper 58	Stability of trade-off balancing in one-stage production scheduling	Wei Li, Barrie Nault, Syed Mohsin and Youlin Huang
Tuesday, June 28,2022 Start: 13:00 R2058		NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 2 Session Chair: Brian Paul (Oregon State) Session Co-chair: Sigmund A Tronvoll (Norwegian U. Sci. & Tech.)
Paper 128	Validation of Manufacturing Process Designs for Stamped Microchannel Recuperators	Chuankai Song, Kenta Noma, Paul Armatis, Brian Fronk and Brian Paul
Paper 104	On Dimensional Control in Rotary Stretch Bending of Aluminum Profiles: Loading-Path Effects	Jun Ma, Sigmund A Tronvoll, Torgeir Welo and Geir Ringen
Paper 11	3D printing of hydrogel-based seed planter for in-space seed nursery	Yanhua Huang, Li Yu, Liangkui Jiang, Xiaolei Shi and Hantang Qin
Tuesday, June 28,2022 Start: 13:00 R2077		NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 2 Session Chair: Sarah J. Wolff (Texas A&M) Session Co-chair: Jing-Jing Shen (Harvard)
Paper 50	Data-driven prediction of next-layer melt pool temperatures in laser powder bed fusion based on co-axial high-resolution Planck thermometry measurements	Dominik Kozjek, Fred Carter, Conor Porter, Kornel Ehmann, Jian Cao and Jon-Erik Mogonye
Paper 120	Effects of surface treatments on ABS mechanical properties from fused filament fabrication	Jing-Jing Shen, Matthew Robert Patterson, Erin Marshall, Jake Dvorak, Stian Romberg and Tony Schmitz
Paper 37	In situ X-ray imaging of directed energy deposition of metals: the comparisons of delivery performance between spherical and irregular powders	Hui Wang, Benjamin Gould, Marwan Haddad, Ziheng Wu and Sarah J. Wolff
Tuesday, June 28,2022 Start: 13:00 R2070		NAMRC - TRACK 5 SMART MANUFACTURING & CYBER-PHYSICAL SYSTEMS - Session 1 Session Chair: Zhaoyan Fan (Oregon State) Session Co-chair: Connie Reichert LaMorte (EWI)
Keynote	Digital Twins in Cyber-Physical Manufacturing Systems: Leveraging Real-Time and Historical Data to Improve Operations	Dawn Tilbury, University of Michigan, Ann Arbor
Paper 159	Tele-Welding: Developing Tools for a Tele-Manufacturing Workforce (Presentation Only)	Connie Reichert LaMorte, Paul Blomquist and Mark Schimming

<p>Tuesday, June 28,2022 Start: 14:50 R1086</p>		<p>NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 3 Session Chair: Michael Sealy (Purdue) Session Co-chair: Murali Sundaram (U. Cincinnati)</p>
Paper 17	Experimental Investigation on the Effect of Electrically Assisted Rapid Heating in Bulk Metal Forming	Ihab Ragai, Michael Müller and Derek Shaffer
Paper 92	Shot Peening Induced Corrosion Resistance of Magnesium Alloy WE43	Tejaswita Patil, Rakeshkumar Karunakaran, Florin Bobaru and Michael Sealy
Paper 27	Prediction of Surface Roughness on Electro Discharge Machined Surfaces	Trilochan Jamunkar and Murali Sundaram
<p>Tuesday, June 28,2022 Start: 14:50 R2070</p>		<p>NAMRC - TRACK 3 MATERIAL REMOVAL - Session 2 Session Chair: Bruce L. Tai (Texas A&M) Session Co-chair: Tony Schmitz (U. Tennessee)</p>
Paper 144	Accurate measurement of cutting-edge radius on a single-crystal diamond tool	Amit Dodmani and Sathyan Subbiah
Paper 38	Dynamic force and stability prediction for milling using feed rate scheduling software and time-domain simulation	Jose Nazario, Timothy No, Michael Gomez, Gregory Corson and Tony Schmitz
Paper 89	A Feasibility Study on Use of an Accelerometer to Measure the Dynamic Forces in Turning	Jay Raval, Otto Randolph, Ryan Zvanut and Bruce L. Tai
<p>Tuesday, June 28,2022 Start: 14:50 R1075</p>		<p>NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 3 Session Chair: Frank Pfefferkorn (U. Wisconsin-Madison) Session Co-chair: Hazim El-Mounayri (Purdue School of Engr. And Tech.)</p>
Paper 166	A framework for graph-base neural network using numerical simulation of metal powder bed fusion for correlating process parameters and defect generation	Suchana Jahan, Mohammad Al Hasan and Hazim El-Mounayri
Paper 82	A Novel 'Tapered key in a slot' Technique for Characterization of Bonding Strength in Laser Directed Energy Deposition	Sachin Alya, Bhargavi Ankamreddy and Ramesh Singh
Paper 103	Influence of laser polishing on fatigue life of conventionally machined and laser powder bed fusion 316L stainless steel	Patrick Faue, Lucas-Hermann Beste, Brodan Richter, Ankur Agrawal, Kevin Klingbeil, Dan Thoma, Tim Radel and Frank Pfefferkorn
<p>Tuesday, June 28,2022 Start: 14:50 R1011</p>		<p>NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 4 Session Chair: Dominik Kozjek (Northwestern) Session Co-chair: Liangkui Jiang (Iowa State)</p>
Paper 109	A Feasibility Study on Directed Energy Deposition of SS 316L with Coaxial Wire-powder Feeding	Yue Zhou and Fuda Ning
Paper 32	Effects of Particle Size Distribution and Impact Speed on Printing Quality in Direct Energy Deposition	Xuepeng Jiang, Weijun Shen, Liangkui Jiang and Hantang Qin
<p>Tuesday, June 28,2022 Start: 14:50 R2058</p>		<p>NAMRC - TRACK 5 SMART MANUFACTURING & CYBER-PHYSICAL SYSTEMS - Session 2 Session Chair: Weihong Guo (Rutgers) Session Co-chair: Jianjing Zhang (Case Western Reserve)</p>
Paper 140	Implementing an open-source sensor data ingestion, fusion, and analysis capabilities for smart manufacturing	Kerry Wang, Parth Dave, Abhishek Hanchate, Dinakar Sagapuram, Gautam Natarajan and Satish Ts Bukkapatnam
Paper 16	Monitoring of Direct Energy Deposition Process Using Deep-Net based Manifold Learning and Co-Axial Melt Pool Imaging	Vigneashwara Pandiyan, Di Cui, Annapaola Parrilli, Pushkar Deshpande, Giulio Masinelli, Sergey Shevchik and Kilian Wasmer
Paper 115	In-Situ and Real-Time 3D Pyrometry for Thermal History Diagnosis in Laser Fusion Process	G. Galkin, V. Gawade, W. Guo, J. Yi and Y.B. Guo

MSEC TECHNICAL SESSIONS-TUESDAY

<p>Tuesday, June 28,2022 09:10-10:40 R2058</p> <p>01-01-01 AM - Additive Manufacturing of Functional Devices and Bioinspired Structures 1 Session Chair: Yang Yang (San Diego State Univ) Session Co-chair: Kenan Song (Arizona State Univ)</p>		
MSEC2022-85050	1D and 2D Nanoparticle Assembly Compliant with Tuned 3D-Printed Topology	Sayli Jambhulkar, Kenan Song
MSEC2022-85646	3D Printing of Salvinia Water Fern-Inspired Superhydrophobic Structures	Qingqing He, Brandon Bethers,Brian Tran,Yang Yang
<p>Tuesday, June 28,2022 09:10-10:40 R2077</p> <p>01-06-01 AM- Smart Additive Manufacturing 1 Session Chair: Prahalda Rao (Univ. of Nebraska) Session Co-chair: Ala Quttawi (Univ of Toledo)</p>		
MSEC2022-85301	A Comparative Study on the Effects of an Advanced Scan Pattern and Intelligent Scan Sequence on Thermal Distribution, Part Deformation, and Printing Time in PBF Additive	Chuan He,Yueh-Lin Tsai,Chinedum Okwudire
MSEC2022-86089	Assessment Of Shape Descriptors for Distortion Prediction In Powder Bed Fusion Process	Hemnath Anandan Kumar, Senthilkumaran K
MSEC2022-86354	Hybrid Modeling the Influence of Post Processing Heat Treatments on the Strengthening Mechanisms of Additively Manufactured Inconel 718	Ala'aldin Alafaghani,Majed Ali,Abdalmageed Almotari,Jian-Qiao Sun, Ala Qattawi
<p>Tuesday, June 28,2022 09:10-10:40 K_G18</p> <p>06-01-01 MP - Advances in Finishing Processes: Hard Machining, Grinding, and Abrasive Finishing 1 Session Chair: Rahul Chaudhari (Timken Corp) Session Co-chair: Xiangliang Jin (Univ of British Columbia)</p>		
MSEC2022-78078	An Improved Hybrid Ensemble Model for Surface Texture Prediction in Sequentially Honed Cylinder Bore	Afzal Burhan,Xueping Zhang,Xin Zhang
MSEC2022-85645	Analysis of the Unique Mechanics of Shear Localization in Metal Cutting Processes	Mohammadreza Fazlali,Mauricio Ponga,Xiaoliang Jin
MSEC2022-85768	Experimental Research on the Macro and Micro Contact Behavior Within Grinding Domain in Abrasive Belt Rail Grinding	Wenxi Wang,Chaoyue Zhao
<p>Tuesday, June 28,2022 09:10-10:40 K_G20</p> <p>06-05-01 MP - Advances in Lightweight and Dissimilar Materials Joining 1 Session Chair: Yongbing Li (Shanghai Jiao Tong Univ) Session Co-chair: Frank Pfefferkorn (Univ of Wisconsin)</p>		
MSEC2022-85716	Novel Correlations Between Process Forces and Void Morphology for Effective Detection and Minimization of Defects During Friction Stir Welding	Mohammad Ali Ansari,Hemant Agiwal,Michael Zinn, Frank Pfefferkorn, Shiva Rudraraju
MSEC2022-85288	Mechanical Property and Microstructure of IN718/FGH96 Dissimilar Superalloy Linear Friction Weldment	Mingxiang Wang,Peihao Geng,Hong Ma,Guoliang Qin
MSEC2022-85574	Prediction of Weld Defects in Underwater Friction Stir Welding of Dissimilar Materials	Raju Mahto,Ananta Dutta,Debasish Mishra
<p>Tuesday, June 28,2022 09:10-10:40 K_G2</p> <p>06-06-01 MP-AM- Advances in Metal Additive Manufacturing Processes 1 Session Chair: Dong Lin (Kansas State Univ) Session Co-chair: Ho Yeung (NIST)</p>		
MSEC2022-85562	Towards Directed Energy Deposition of Metals Using Polymer-Based Supports: Hardness of 316L Stainless Steel Deposited on Carbon-Fiber-Reinforced Abs	Rebecca Kurfess,Rangasayee Kannan,Thomas Feldhausen,Kyle Saleeby, A. John Hart,David Hardt
MSEC2022-84945	Directed Energy Deposition Using Non-Spherical Metal Powders?	Richie Garg,Harish Singh Dhama,Priti Ranjan Panda,Koushik Viswanathan
MSEC2022-84993	Selective Laser Melting of Crack-Free Ti-48Al-2Cr-2Nb Alloy: Improved Manufacturability by Powder Surface Modification Using Graphene Oxide	Xing Zhang, Dian Li,Yufeng Zheng,Yiliang Liao
<p>Tuesday, June 28,2022 09:10-10:40 K_G4</p> <p>07-01 MS - Human-machine-interaction in Advanced Manufacturing Session Chair: Yunbo Zhang (Rochester Inst of Tech) Session Co-chair: Rui Liu (Rochester Inst of Tech)</p>		
MSEC2022-85770	Immersive Virtual Reality Training with Error Management for Cnc Milling Set-Up	Matt Ryan,Yiwen Wang,Qinqin Xiao,Rui Liu,Yunbo Zhang
MSEC2022-85804	Investigating the Role of Auditory Perception of Cutting Process Conditions in CNC Machining	Krzysztof Jarosz,Yunbo Zhang,Rui Liu
MSEC2022-83907	Evaluation of Data-Driven Models in Human-Robot Load-Sharing	Vinh Nguyen, Jeremy Marvel

<p>08-03 NMM- Low-dimensional Nanostructured Carbon and Related Materials: Synthesis, Self-Organization, and Printing Session Chair: Mostafa Bedewy (Univ of Pittsburgh) Session Co-chair: Michael Cai Wang (Univ of South Florida)</p>		
<p>Tuesday, June 28,2022 09:10-10:40 K_G10</p>	<p>Unexpectedly High Yields in Chemical Vapor Deposition of Carbon Nanotubes Based on Reactor Wall Thermochemical History</p>	<p>Golnaz Tomaraei,Moataz Abdulhafez,Mostafa Bedewy</p>
<p>MSEC2022-85633</p>	<p>Synthesis and Fabrication of Single Walled Carbon Nanotube Microelectrode Arrays on Flexible Probes for Neurotransmitter Detection</p>	<p>Sei Jin Park,Anna Ivanovskaya,: Allison Yorita</p>
<p>01-01-02 AM - Additive Manufacturing of Functional Devices and Bioinspired Structures 2 Session Chair: Xiangjia Li (Arizona State Univ) Session Co-chair: Lin Li (Univ of Illinois - Chicago)</p>		
<p>Tuesday, June 28,2022 13:00-14:30 K_G18</p>	<p>Scalable Multi-Material Additive Manufacturing of Polymeric Material With Metallic Structures via Electrically Assisted Stereolithography</p>	<p>Tengteng Tang, Bhushan Ahire,Xiangjia Li</p>
<p>MSEC2022-85845</p>	<p>A Functionally Gradient Niti Shape-Memory Alloy Fabricated by Selective Laser Melting</p>	<p>Kun Li,Jianbin Zhan,Ruijin Ma,Yingzhi Ren, Jinxin Lin</p>
<p>MSEC2022-83645</p>	<p>Shape Memory Properties of 4d Printed Parts Under Cyclic Loadings: Effects of Infill Pattern and External Stimulus</p>	<p>Muyue Han,Jing Zhao, Lin Li,Miao Tan</p>
<p>MSEC2022-85825</p>		
<p>01-06-02 AM- Smart Additive Manufacturing 2 Session Chair: Chinedum Okwudire (Univ. of Michigan) Session Co-chair: Christopher Saldana (Georgia Tech)</p>		
<p>Tuesday, June 28,2022 13:00-14:30 K_G20</p>	<p>Acoustic Process Monitoring of Contact Tip to Work Piece Distance in Wire Arc Additive Manufacturing by Random Forest Algorithms</p>	<p>Dylan Hebert,Austen Thien,Christopher Saldana</p>
<p>MSEC2022-85404</p>	<p>Improving Geometric Accuracy in Wire and Arc Additive Manufacturing with Machine Learning</p>	<p>Cesar Ruiz Torres,Davoud Jafari,Vignesh Venkata Subramanian,Tom H.J. Vaneker,Wei Ya,Qiang Huang</p>
<p>MSEC2022-85325</p>	<p>Physics-Informed Artificial Intelligence for Temperature Prediction in Metal Additive Manufacturing: A Comparative Study</p>	<p>Suyog Ghungrad,Benjamin Gould,Sarah Wolff,Zadeh Haghighi</p>
<p>MSEC2022-85159</p>		
<p>06-01-02 MP - Advances in Finishing Processes: Hard Machining, Grinding, and Abrasive Finishing 2 Session Chair: Hitomi Yamaguchi (Univ of Florida) Session Co-chair: Radu Pavel (TechSolve Inc.)</p>		
<p>Tuesday, June 28,2022 13:00-14:30 K_G2</p>	<p>Process Mechanics – a Guide to Industry 4.0: Modelling Cutting of Nimonic 90 and Ti-Al-6v</p>	<p>Wolfgang Lortz,Radu Pavel</p>
<p>MSEC2022-85443</p>	<p>The Impact of Processing Honing Stone on Its Surface Topography and Honed Performance</p>	<p>Xin Zhang,Xijuan Liu,Xueping Zhang</p>
<p>MSEC2022-85349</p>	<p>Machine Learning-Based Cutting Constant Estimation for Mechanistic Force Models of End Milling Operation</p>	<p>Shubham Vaishnav,Kaushal A Desai</p>
<p>MSEC2022-85587</p>		
<p>06-05-02 MP - Advances in Lightweight and Dissimilar Materials Joining 2 Session Chair: Xun Liu (Ohio State Univ) Session Co-chair: Yongbing Li (Shanghai Jiao Tong Univ)</p>		
<p>Tuesday, June 28,2022 13:00-14:30 K_G4</p>	<p>Effect of Alloying Elements of Al Alloy on the Interfacial Microstructure and Fracture Behaviour of Al Alloy/steel Inertia Friction Welded Joint: A Comparative Study</p>	<p>Hong Ma,Peihao Geng,Guoliang Qin</p>
<p>MSEC2022-85196</p>	<p>Learning the Temporal Effect in Infrared Thermal Videos With Long Short-Term Memory for Weld Quality Prediction in Resistance Spot Welding</p>	<p>Shenghan Guo,Dali Wang, Jian Chen,Zhili Feng,Weihong Guo</p>
<p>MSEC2022-85422</p>	<p>Influence of Silane Treatment on the Joint Properties During Laser Joining of Aluminum Alloy to Cfrtp</p>	<p>Ziwei Feng, Xueyan Zhang,Jianhui Su,Yifan Liu, Hongyun Zhao,Bo Chen,Xiaoguo Song,Caiwang Tan</p>
<p>MSEC2022-85298</p>		

<p>Tuesday, June 28,2022 13:00-14:30 K_G10</p> <p>06-06-02 MP-AM- Advances in Metal Additive Manufacturing Processes 2 Session Chair: Wenchao Zhou (Univ of Arkansas) Session Co-chair: Dong Lin (Kansas State Univ)</p>		
MSEC2022-85620	Selective Laser Melting and Mechanical Properties of Oxide Dispersion Strengthened Haynes 214 Alloy	Bibek Poudel,Hoa Xuan Nguyen,Aaron M. Oneil,Mohsan Uddin Ahmad, Zhiyuan Qu,Patrick Kwon, Haseung Chung
MSEC2022-85722	Investigating the Heterogeneity in Microstructure Evolution During Selective Laser Melting of Titanium Aluminides: An Integrated Experimental and Modeling Study	Xing Zhang,Leslie Mushongera, Yiliang Liao
MSEC2022-85746	An Investigation into Multi-Track Deposition in Laser Powder-Bed Fusion: Transient Regions Analysis and Scan Length Effects	Santosh Rauniyar,Subin Shrestha,Kevin Chou
<p>Tuesday, June 28,2022 13:00-14:30 K_G12</p> <p>07-02 MS- Prognostics and Health Management (PHM) using Data Analytics and Artificial Intelligence Session Chair: Xiaoning Jin (Northeastern Univ) Session Co-chair: Chenhui Shao (UIUC)</p>		
MSEC2022-85459	Anomaly Scoring Model for Diagnosis on Machine Condition and Health Management	Byung Gun Joung, Zhongtian Li, John Sutherland
MSEC2022-85670	A Novel Quality Clustering Methodology on Fab-Wide Wafer Map Images in Semiconductor Manufacturing	Yuan-Ming Hsu,Xiaodong Jia,Wenzhe Li, Jay Lee
MSEC2022-85269	Comparison of Human Skeleton Trackers Paired with a Novel Skeleton Fusion Algorithm	Jared Flowers,Gloria Wiens
<p>Tuesday, June 28,2022 13:00-14:30 R1075</p> <p>08-02-01 NMM - Advances in Micro- and Nano-scale Additive Manufacturing 1 Session Chair: Sourabh Saha (Georgia Tech) Session Co-chair: Bruno Azeredo (Arizona State Univ)</p>		
MSEC2022-97748	Engineered Materials and Composites Enabled by Additive Manufacturing and Nanoengineering (Invited Keynote)	
<p>Tuesday, June 28,2022 14:50-16:20 R2077</p> <p>01-01-03 AM - Additive Manufacturing of Functional Devices and Bioinspired Structures 3 Session Chair: Chi Zhou (Univ. of Buffalo) Session Co-chair: MD Habib (Keene State College)</p>		
MSEC2022-85374	Development of an In-House Customized Perfusion-Based Bioreactor for 3D Cell Culture	Amar Abbatiello,Md Ahasan Habib
MSEC2022-85426	Design and Manufacturing of a Functionally Graded Porous Dental Implant	Rana Dabaja,Bogdan Popa,Sun-Yung Bak,Gustavo Mendonca,Miki Banu
<p>Tuesday, June 28,2022 14:50-16:20 K_G18</p> <p>01-06-03 AM- Smart Additive Manufacturing 3 Session Chair: Brian Giera (Lawrence Livermore National Lab) Session Co-chair: Huachao Mao (Purdue Univ)</p>		
MSEC2022-85691	Smart Resin Vat: Real-Time Detecting Failures, Defects, and Curing Area in Vat Photopolymerization 3D Printing	Yujie Shan, Aravind Krishnakumar, Zehan Qin,Huachao Mao
MSEC2022-85697	Surface Roughness Characterization for Additive Manufactured Products via Double Kernel Smoothing Spatial Variogram Estimation	Andi Wang,Davoud Jafari,Tom Vaneker,Qiang Huang
MSEC2022-85846	A Shape Registration Methodology for Geometric Deviation Correction in Additive Manufacturing	Yuanxiang Wang,Cesar Ruiz,Sanglok Park,Kyeong-Ho Shin,Joo-Hyung Kim,: Qiang Huang
<p>Tuesday, June 28,2022 14:50-16:20 K_G2</p> <p>06-05-03 MP - Advances in Lightweight and Dissimilar Materials Joining 3 Session Chair: Yunwu Ma (Osaka Univ) Session Co-chair: Xiaowei Yue (Virginia Tech)</p>		
MSEC2022-85439	Towards a Digital Twin: Simulation and Residual Stress Analysis in Aerospace Composite Structures Assembly	Tim Lutz,Xiaowei Yue,Jaime Camelio
MSEC2022-84991	Joining of Metal-Thermoplastic-Tube-Joints by Hydraulic Expansion	Florian Weber,Peter Lehmenkühler, Marlon Hahn,A. Erman Tekkaya
MSEC2022-81781	The Development and Validation of a Novel Thread Forming Fastener for High Strength Steel Applications	Brandt Ruszkiewicz,Eric Breidenbaugh,Gene Simpson

Tuesday, June 28,2022 14:50-16:20 K_G4		
06-06-03 MP-AM- Advances in Metal Additive Manufacturing Processes 3 Session Chair: Ho Yeung (NIST) Session Co-chair: Wenchao Zhou (Univ of Arkansas)		
MSEC2022-85387	Layer-Wise Melt Pool Temperature Evolution in Laser Powder Bed Fusion: An Experimental Study Using a Single Camera Based Two-Wavelength Imaging Pyrometry	Chaitanya Krishna Vallabh,Shawn Hinnebusch, Albert To, Xiayun Zhao
MSEC2022-82773	Image-Based Fractographic Pattern Recognition With Cluster Analysis	Shenghan Guo,Paul Paradise,Nicole Van Handel,Dhruv Bhate
MSEC2022-78115	Towards Multilayered Coatings of 304L Stainless Steels Using Friction Surfacing	Hemant Agiwal,Christian Baumann,Stephan Krall,Hwasung Yeom,Kumar Sridharan,Friedrich Bleicher,Frank Pfefferkorn
Tuesday, June 28,2022 14:50-16:20 K_G10		
07-04 MS- Advances in Learning, Modeling, and Prediction of Manufacturing Systems Session Chair: Gregory Vogl (NIST) Session Co-chair: Yongzhi Qu (Univ of Minnesota - Duluth)		
MSEC2022-85690	Sequential Robust Parameter Design with Sample Size Selection	Jaesung Lee, Shiyu Zhou,Junhong Chen
MSEC2022-85718	Curating Datasets of Flexible Assemblies to Predict Spring-Back Behavior for Machine Learning Purposes	Alex Adrian,Satchit Ramnath,Sai Chandu Sunkara,Yannis Korkolis,Joseph Davidson,Jami Shah
MSEC2022-87425	Research on Condition Monitoring Technology of Automobile Parts Intelligent Production Line Based on Information Physics System	Yifei Wang,Zhiwen Xia, Kexin Yang, Lijun Jin
Tuesday, June 28,2022 14:50-16:20 K_G12		
08-02-02 NMM - Advances in Micro- and Nano-scale Additive Manufacturing 2 Session Chair: Nilabh Roy (Canon Nanotechnologies) Session Co-chair: Sourabh Saha (Georgia Tech)		
MSEC2022-80989	Inkjet Printing of PEDOT:PSS Inks for Robotic Skin Sensors	Olalekan Olowo,Ruoshi Zhang,Andriy Sherehiy,Brian Goulet, Alexander Curry,Danming Wei,Zhong Yang,Moath Alqatamin,Dan Popa
MSEC2022-85649	Characterizing the Conductivity of Aerosol Jet Printed Silver Traces on Glass Using Intense Pulsed Light (IPL)	Connor Ferris, Dilan Ratnayake, Alexander Curry,Danming Wei, Erin Gerber,Thad Druffel,Kevin Walsh
MSEC2022-80318	Cold Spray Multilayer Metal Build-Up on a Polymeric Substrate	Jung-Ting Tsai,Martin Byung-Guk Jun,David Bahr

NAMRC TECHNICAL SESSIONS-WEDNESDAY

Wednesday, June 29,2022 Start: 9:10 K_G23		NAMRC - Student Competition - Session 3] Session Chair: Lin Liu (U. Kansas) Session Co-chair: Papia Sultana (UIUC)
Paper 68	Stamping Colors with Solid-State Superionic Stamping (S4)	Boqiang Qian, Papia Sultana, Placid Ferreira, Glennys Mensing and Pingju Chen
Paper 1	Real-time Multiple-particle Tracking in Ultrasonic Spray Pyrolysis	Cade Albert, Lin Liu, John Haug, Huixuan Wu, Ruichen He and Jiarong Hong
Wednesday, June 29,2022 Start: 9:10 R1075		NAMRC - TRACK 1 MANUFACTURING SYSTEMS - Session 3 Session Chair: Laine Mears (Clemson) Session Co-chair: Jingyan Dong (North Carolina State)
Paper 2	Optimum utilization of on-demand manufacturing and laser polishing in existence of supply disruption risk	Durul Ulutan, Zülal İşler, Burak Erkan Kaya and Mustafa Hekimoğlu
Paper 42	Freeform printing and modeling of soft twisting electrothermal actuators	Yang Cao and Jingyan Dong
Paper 88	Wearable shear and normal force sensing glove development for real-time feedback on assembly line processes	Scott Kerner, Matthew Krugh and Laine Mears
Wednesday, June 29,2022 Start: 9:10 R1011		NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 4 Session Chair: Arif Malik (UT Dallas) Session Co-chair: Simon Park (U. Calgary)
Paper 10	Manufacturing of Pitch Based Carbon Fibers through Microwave Treatments	Lin Ge, Talha Zafar, Danny Wong and Simon Park
Paper 5	Numerical investigation elucidating effects of microstructure on the transient thermomechanical phenomena during laser impact welding	Glenn Gleason, Sumair Sunny, Ritin Mathews and Arif Malik
Paper 164	Novel Fatigue Testing of Extruded Inconel 718	Shyam-Sundar Balasubramanian, Prathiksha Ramprasad Dhanpal, James Hyder, Mike Corliss and Wayne Nguyen Hung
Wednesday, June 29,2022 Start: 9:10 R2058		NAMRC - TRACK 3 MATERIAL REMOVAL - Session 3 Session Chair: Kaan Bahtiyar (Oregon State) Session Co-chair: Aash M Shah (Clemson)
Paper 3	Effect of Coolant upon Hole Making Accuracy of Ti6Al4V by Drilling — Consideration of Hole Diameter in the Depth Direction	Hukuzo Yagishita and Mikio Fujio
Paper 65	Analyzing the evolution of tool wear area in trochoidal milling of Inconel 718 using image processing methodology	Ankit Agarwal, Nils Potthoff, Aash M Shah, Laine Mears and Petra Wiederkehr
Paper 80	Lightweight and Robust Chatter Detection Algorithms for Milling	Kaan Bahtiyar and Burak Sencer
Wednesday, June 29,2022 Start: 9:10 R2077		NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 5 Session Chair: Michael Sealy (Purdue) Session Co-chair: Marwan Haddad (Texas A&M)
Paper 35	Laser Spot Melting on Ti-6Al-4V Substrates: A Study on Thermal History and Keyhole Porosity	Marwan Haddad, Karlie Nixon, Ronald Sellers, Guillermo Anez Lijeron, Hui Wang, Benjamin Gould and Sarah J. Wolff
Paper 63	Multi-Station Multi-Axis Hybrid Layered Manufacturing (MSMA-HLM)	Karunakaran K P, Neel Kamal Gupta, Ashik Kumar Patel, Rakeshkumar K, Ganesan G, Siddhartha, Michael Sealy and Alain Bernard
Paper 59	Vision-Based Quality Assurance of Composites Printed by Extrusion-Based 3D-Printers	Purvatya Patel, Abdallah Elsayed and Sheng Yang

Wednesday, June 29,2022 Start: 13:30 R1062		NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 5 Session Chair: Nilesh Vasa (IIT Madras) Session Co-chair: Homar Lopez-Hawa (Wichita State)
Paper 97	Effect of rotary ultrasonic machining parameters on surface integrity of advanced ceramics	Iqbal Shareef, Julia Bjerke, Wasiq A.M. Abdul and Dennis Kroll
Paper 130	On the Mechanical Response of Aluminum Alloy 6061-T6 under Extreme Strains and Strain Rates, and Rapid Heating	Homar Lopez-Hawa, Steven Mates, Wilfredo Moscoso-Kingsley and Viswanathan Madhavan
Paper 95	Fabrication of random nanocones to improve wideband light trapping for thin film photovoltaic devices using nanosecond laser processing	Esther Blesso Vidhya Y and Nilesh Vasa

Wednesday, June 29,2022 Start: 13:30 R2082		NAMRC - TRACK 1 MANUFACTURING SYSTEMS - Session 4 Session Chair: Anil K. Srivastava (U Texas Rio Grande Valley) Session Co-chair: Megan McGovern (General Motors)
Paper 158	Energy Efficient Washers and Ovens for the Metal Finishing Industry	Steven Onsager
Paper 28	Turning of Carbon Fiber Reinforced Polymer (CFRP) Composites: Process Modeling and Optimization using Taguchi Analysis and Multi-Objective Genetic Algorithm	S M Abdur Rob and Anil K. Srivastava
Paper 153	Enabling thermography of highly reflective laser welds using a multi-flash sequence approach	Megan McGovern, Teresa Rinker, Sean Wagner, Ryan Sekol, Ronald Lesperance, James Schroth and Diana Wegner

Wednesday, June 29,2022 Start: 13:30 R1011		NAMRC - TRACK 3 MATERIAL REMOVAL - Session 4 Session Chair: Yang Guo (Michigan State) Session Co-chair: Xiaoliang Jin(U. British Columbia)
Paper 141	Study on improved surface texture and surface finish of electron beam melting manufactured Ti6Al4V using piezo vibration striking treatment	Jisheng Chen, Yang Xu, Patrick Kwon and Yang Guo
Paper 61	Approach and Development of a Methodology for Machining of Shapes in Cylindrical Bores by Precision Honing	Murat Güner, Mario Daniel and Dirk Bähre
Paper 123	Coupled Eulerian-Lagrangian model for residual stress prediction in orthogonal cutting of Waspaloy	Shenliang Yang, Mohammadreza Fazlali and Xiaoliang Jin

Wednesday, June 29,2022 Start: 13:30 R2058		NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 6 Session Chair: Hazim El-Mounayri (Purdue School of Engr. And Tech.) Session Co-chair: Yayue Pan (U. Illinois,Chicago)
Paper 116	Build surface study of single-layer raster scanning in selective laser melting: Surface roughness prediction using artificial neural network machine learning	Behzad Fotovvati and Kevin Chou
Paper 34	Real-time computation of thermal distribution using non-homogenous graph theory in metal powder bed fusion process	Ehsan Malekipour and Hazim El-Mounayri
Paper 78	3D Printing of Anisotropic Multimaterial Structures using Acoustic Streaming-assisted Two-Photon Polymerization	Ketki Lichade and Yayue Pan

Wednesday, June 29,2022 Start: 13:30 R2077		NAMRC-TRACK 6 INDUSTRIAL APPLICATIONS&MANUFACTURING EDUCATION - Session 1 Session Chair: Albert J. Shih (U. Michigan) Session Co-chair: Nico Zimmermann (ETH)
Paper 66	An action-oriented teaching approach for intelligent and energy efficient precision manufacturing	Nico Zimmermann, Josef Mayr and Konrad Wegener
Paper 124	A Common First-Year Undergraduate Engineering Course in Manufacturing based on Industrial Robots and Flipped Classroom	Miguel A. Funes-Lora, Albert Q. Fu, Noah Webster, Sarah Burcon and Albert J. Shih
Paper 22	A Case Study on First Time Quality Feature Investigation for an Automotive Paint Shop	Hua-Tzu Fan, Guoxian Xiao, Jorge Arinez and Mike Coulthard

<p>Wednesday, June 29,2022 Start: 15:20 R1062</p>		<p>NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 6 Session Chair: John Agapiou (General Motors) Session Co-chair: Stefania Bruschi (U. Padova)</p>
Paper 156	Development on Die-Cast Copper Motor Rotors – Casting Considerations	John Agapiou
Paper 12	The Effect Of The Building Direction And Surface Finish On The Mechanical Properties Of The Direct Energy Deposited AISI 316L Stainless Steel	Rachele Bertolini, Matteo Perini, Andrea Ghiotti and Stefania Bruschi
Paper 100	Modeling and Performance of CW Laser Polishing of Electron Beam Melted Ti6Al4V	Justin Hijam, Rohit Gupta, Madhu Vadali and Amit Arora
<p>Wednesday, June 29,2022 Start: 15:20 R2082</p>		<p>NAMRC - TRACK 3 MATERIAL REMOVAL - Session 5 Session Chair: Sathyan Subbiah (IIT Madras) Session Co-chair: Muhammad Jahan (Miami U.)</p>
Paper 87	Quilting response of diamond turned gravitationally formed porous-nonporous interface of metal foams	Vinothkumar Sundharamoorthi, Dennis Wee Keong Neo, Huang Rui, Swee Hock Yeo, Sankaran Shanmugam and Sathyan Subbiah
Paper 148	High frequency cutting force measurement during saw tooth chip formation of Al-7075-T6 for critical flow stress estimation	Pavan Bhavsar, Viswanathan Madhavan and Wilfredo Moscoso Kingsley
Paper 112	Numerical modeling and simulation of machining of 3D printed CFRP composite	Mahmudul Hassan, Jianfeng Ma and Muhammad Jahan
<p>Wednesday, June 29,2022 Start: 15:20 R1075</p>		<p>NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 7 Session Chair: Zhaoyan Fan (Oregon State) Session Co-chair: David Manford (U. Arizona)</p>
Paper 129	Accuracy of Build Time and Mass Estimates from Slicer Software for Fused Filament Fabrication	David Manford, Hannah Budinoff and Jannatul Bushra
Paper 110	Tracking and quantifying spatter characteristics in a laser directed energy deposition process using Kalman filter	Ashif Iquebal, Aakash Yadav, Bhaskar Botcha, Rama Krishna Gorthi and Satish Bukkapatnam
Paper 122	Material composition sensing for additive manufacturing based on cooling rate monitoring	Xianzhe Fu and Zhaoyan Fan
<p>Wednesday, June 29,2022 Start: 15:20 R1011</p>		<p>NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 8 Session Chair: Jia Deng (Binghamton) Session Co-chair: Xiangjia Li (Arizona State)</p>
Paper 126	Electric field assisted fused deposition modeling for improving nozzle cleanliness	Shantanu Gaurkhede and Jia Deng
Paper 127	3D Printing of Largescale Functional Nanofilm using Electrically assisted Direct Ink Deposition	Yizhen Zhu, Banashree Gogoi, Pranith Alluri, Mitesh Suhas Despande, John Hutchins, Edem Tagbor, T.L. Alford and Xiangjia Li
Paper 117	Material extrusion of stainless-steel plate-lattice structure: Part shrinkage, microstructure, and mechanical performance	Dayue Jiang and Fuda Ning
<p>Wednesday, June 29,2022 Start: 15:20 R2058</p>		<p>NAMRC -TRACK 5 SMART MANUFACTURING&CYBER-PHYSICAL SYSTEMS - Session 3 Session Chair: Rohan Shirwaiker (North Carolina State) Session Co-chair: Dehao Liu (Binghamton U.)</p>
Paper 143	Investigating Autoregressive and Machine Learning-based Time Series Modeling with Dielectric Spectroscopy for Predicting Quality of Biofabricated Constructs	Shohanuzzaman Shohan, Mahmud Hasan, Binil Starly and Rohan Shirwaiker
Paper 60	Metal Additive Manufacturing Process Design based on Physics Constrained Neural Networks and Multi-Objective Bayesian Optimization	Dehao Liu and Yan Wang
Paper 102	Machine Learning Classification of Surface Fracture in Ultra-Precision Diamond Turning Using CSI Intensity Map Images	Monica Nogueira, Noel Greis, Rachit Shah, Matthew Davies and Nicholas Sizemore

MSEC TECHNICAL SESSIONS-WEDNESDAY

<p>Wednesday, June 29,2022 09:10-10:40 K_G18</p> <p>01-04-01 AM-Advances in Additive Manufacturing of Polymers and Polymer Composites 1 Session Chair: Kun Fu (Univ. of Delaware) Session Co-chair: Yiran Yang (Univ. of Texas - Arlington)</p>		
MSEC2022-85176	Characterization of Polylactic Acid Filament With Biodegradable Hemp Fiber Infused During Additive Manufacturing Process	Matthew Hanson,Che-Hao Yang
MSEC2022-85435	Investigation of the Mechanical Properties and Bioactivity of Additively Manufactured Bone Tissue Scaffolds, Composed of Polyamide, Polyolefin, and Cellulose Fibers	Paavana Krishna Mandava,Robert Joyce,James Day,Roozbeh (Ross) Salary
MSEC2022-85627	Additive Manufacturing of Novel Beam Lattice Metamaterials with Hollow Cross-Sections Towards High Stiffness/strength-to-Weight Ratio	Md Humaun Kobir,Xin Liu,Yiran Yang, Fang Jiang
<p>Wednesday, June 29,2022 09:10-10:40 R1062</p> <p>02-01 JMSE State-of-the-Art Papers Session Chair: Karl Haapala (Oregon State Univ) Session Co-chair: Roland Chen (Washington State Univ)</p>		
MSEC2022-85705	A Review of State-of-the-Art Enabling Manufacturing Processes for Precision Medicine	Atheer Awad,Alvaro Goyanes,Abdul Basit,Ahmed Zidan,Changxue Xu, Wei Li,Roger Narayan,Roland Chen
MSEC2022-85648	The Role of Industry 4.0 Technologies in Manufacturing Sustainability Assessment	Devarajan Ramanujan,William Z. Bernstein,Nancy Diaz-Elsayed,Karl Haapala
<p>Wednesday, June 29,2022 09:10-10:40 K_G20</p> <p>03-02-01 BM- Advances in Manufacturing, Analysis, and Development of Biomedical Devices 1 Session Chair: Yihao Zheng (WPI) Session Co-chair: Bruck Tai (TAMU)</p>		
MSEC2022-85516	A Novel Objective Function for the Inverse Problem of Simultaneous Identification of Unknown Young's Modulus and Boundary Conditions With Noisy and Partial Observation	Tian Xu,Shilun Du,Murong Li,Yingda Hu,Zhen Wang, Yong Lei
MSEC2022-85764	Design and Analysis of a Novel Experiment Platform for 3D Needle Insertion Based on Orthogonally Arranged Dual Camera	Shilun Du,Murong Li,Tian Xu,Yingda Hu,Zhen Wang,Yong Lei
MSEC2022-86032	Manufacturing of the Eriedescent Sterilizing Device	Arvin Sharifbaev,Rachana Mamidi,Manikanth Reddy Gottimukkula,Matthew Gacura, Gary Vanderlaan,Xiaoxu Ji, Davide Piovesan
<p>Wednesday, June 29,2022 09:10-10:40 K_G2</p> <p>05-02-01 ME- Dimensional Inspection Metrology in Advanced Manufacturing 1 Session Chair: ChaBum Lee (TAMU) Session Co-chair: Kaushalkumar Desai (Indian Inst. of Technology)</p>		
MSEC2022-85783	Real-Time Structured Light Scanning Characterization of Surface Topography of Direct Energy Deposited 316l Stainless Steel	Weijun Shen,Xing Zhang,Yiliang Liao,Beiwen Li
MSEC2022-85442	Vision-Sensor Fusion-Based Low-Cost Dimension Measurement System for Machining Shop Floor	Swarit Anand Singh,Aitha Sudheer Kumar,Pratik C Sorathiya
MSEC2022-85343	Enhanced Three-Dimensional Surface Profiling Technique Based on a Feature-Selective Segmentation and Merging	Xiangyu Guo,Chabum Lee
<p>Wednesday, June 29,2022 09:10-10:40 K_G4</p> <p>06-05-04 MP - Advances in Lightweight and Dissimilar Materials Joining 4 Session Chair: Shenghan Guo (Arizona State Univ) Session Co-chair: Mihaela Banu (Univ of Michigan)</p>		
MSEC2022-80877	Joining Similar & Dissimilar Materials W/ No Heat Affected Zone Using 1/10th the Energy (Presentation only)	Paul Cheng
MSEC2022-83697	Performance Prediction of Resistance Spot Welding Joints Using a Modified GTN Model	Weiling Wen,Mihaela Banu
MSEC2022-85466	A Comparative Study of Self-Piercing Riveting and Friction Self-Piercing Riveting of Cast Aluminum Alloy Al-Si7mg	Bingxin Yang, Yunwu Ma,He Shan,Yongbing Li

<p>06-12-01 MP_NMM- Advanced Machining and Metrology for Smart Manufacturing Technologies 1</p> <p>Session Chair: Takashi Matsumura (Tokyo Denki Univ)</p> <p>Session Co-chair: Naruhiro Irino (DMG Mori Co.)</p>		
<p>Wednesday, June 29,2022 09:10-10:40 K_G10</p>		
MSEC2022-83881	Establishment of Mode Shape Database for Machine Tool and Its Application in Estimating System Dynamics	Jiahui Liu,Toru Kizaki,Shogo Yamaura,Naohiko Sugita
MSEC2022-85416	Cutting Process in Slot Milling of AISI420 Stainless Steel Manufactured in Additive Process	Shoichi Tamura,Takeru Ishikuri,Katsufumi Inazawa,Takashi Matsumura
MSEC2022-85472	Shape Error Analysis in Ultra-Precision Grinding of Optical Glass by Using Motor-Current-Based Grinding Force Monitoring	Naoki Iinuma, Boshi Chen,Tappei Kawasato,Yasuhiro Kakinuma
<p>07-05-01 MS - Cloud Manufacturing and Industrial Internet towards Agile and Resilient Manufacturing during and after COVID Era 1</p> <p>Session Chair: Yujie Chen (Caterpillar Inc)</p> <p>Session Co-chair: Yuqian Lu (Univ of Auckland)</p>		
<p>Wednesday, June 29,2022 09:10-10:40 K_G12</p>		
MSEC2022-85362	Individual-Based Transfer Learning for Dynamic Human-Robot Collaborative Disassembly Line Balancing	Yilin Fang, Xiao Zhang
MSEC2022-86090	Collaborative Filtering Recommendation Based Trust Evaluation Method for Cloud Manufacturing Service	Pei Jiang, Mingxing Wang,Xiaobin Li,Chao Yin
MSEC2022-85367	An Intelligent Switching Method of Multi-Resolution Models Oriented for Complex System Co-Simulation	Wenzheng Liu,Chun Zhao, Heming Zhang
<p>08-02-03 NMM - Advances in Micro- and Nano-scale Additive Manufacturing 3</p> <p>Session Chair: Bruno Azeredo (Arizona State Univ)</p> <p>Session Co-chair: Nilabh Roy (Canon Nanotechnologies)</p>		
<p>Wednesday, June 29,2022 09:10-10:40 K_G5</p>		
MSEC2022-85894	Robust and Scalable Synthesis of High Surface Area Porous Copper Spheriodized Powders by Electroless Chemical Dealloying	Stanislaw Niazorau,Natalya Kublik,Amm Hasib, Bruno Azeredo
MSEC2022-85997	Electrical Resistance Metrology in Nanoparticle Sintering Simulations	Obehi Dibua,Chee Foong,Michael Cullinan
MSEC2022-85745	Effect of Withdrawal Velocity on Particle Entrainment from Density Mismatched Mixture	S M Naser Shovon,Md Ibrahim Khalil,Adeeb Alam,Bashir Khoda
<p>01-02-01 AM - Modeling and Simulation of Additive Manufacturing Processes 1</p> <p>Session Chair: Jing Zhang (Indiana Univ)</p> <p>Session Co-chair: Lin Li (Univ of Illinois - Chicago)</p>		
<p>Wednesday, June 29,2022 13:30-15:00 K_G18</p>		
MSEC2022-79992	Deep Learning-Based Super-Resolution for the Finite Element Analysis of Additive Manufacturing Process	Yi Zhang,Elton Freeman
MSEC2022-85830	Effects of Stimulus Conditions on Shape Memory Cycle Durability of 4D Printed Parts in Stereolithography Additive Manufacturing	Jing Zhao,Muyue Han, Lin Li,Miao Tan
MSEC2022-85673	Numerical Studies on Cold Spray Particle Deposition Using a Rectangular Nozzle	Theodore Gabor,Semih Akin, Jung-Ting Tsai,Seunghwan Jo,Feraas Al-Najjar,Martin Byung Guk Jun
<p>01-04-02 AM-Advances in Additive Manufacturing of Polymers and Polymer Composites 2</p> <p>Session Chair: Xiangyang Dong (Missouri S&T Univ)</p> <p>Session Co-chair: Rajiv Malhotra (Rutgers Univ.)</p>		
<p>Wednesday, June 29,2022 13:30-15:00 K_G20</p>		
MSEC2022-80882	Multiplexed 3d Printing of Thermoplastics	Jeremy Cleeman,Alex Bogut,Brijesh Mangrolia,Adeline Ripberger,Arad Maghoul,Kunal Kate,Rajiv Malhotra
MSEC2022-85056	One-Step 3D Printed Layers Along With Xy-in-Plane Directions for Enhanced Multifunctional Nanocomposites	Dharneedar Ravichandran,Kenan Song
MSEC2022-85409	Characterization of the Direct Write Inkjet Printing Process for Automated Fabrication of the PEDOT:PSS Thin Films.	Sara Morice,Andriy Sherehiy,Danming Wei,Dan O. Popa

<p>Wednesday, June 29,2022 13:30-15:00 K_G2</p> <p>03-02-02 BM- Advances in Manufacturing, Analysis, and Development of Biomedical Devices 2 Session Chair: Lei Chen (Univ of Massachusetts - Lowell) Session Co-chair: Yuan-Shin Lee (NCSU)</p>		
MSEC2022-80573	Experimental and Numerical Investigation of Short-Term Bio-Degradation Behavior of 3D Printed PLA	Recep Ilhan, Safa Senaysoy, Huseyin Lekesiz
MSEC2022-85693	A Neural Network Based Framework of Real-Time Heat Map Generation for Surgical Hand-Held Drilling	Pei-Ching Kung, Mahtab Heydari, Bruce L. Tai
MSEC2022-85832	Design and Fabrication of Fmri-Compatible Flexible Neural Microprobes for Deep Brain Stimulation and Neuroscience Study Applications	Yi Wang, Sungho Lee, Yenyu Ian Shih, Yuan-Shin Lee
<p>Wednesday, June 29,2022 13:30-15:00 K_G4</p> <p>05-02-02 ME- Dimensional Inspection Metrology in Advanced Manufacturing 2 Session Chair: Beiwen Li (Iowa State Univ) Session Co-chair: ChaBum Lee (TAMU)</p>		
MSEC2022-85660	Review of KEI Method-Based Dimensional Measurement, Positioning Control and Part Inspection	Zhikun Wang, Chabum Lee
MSEC2022-85540	Research on Positioning Error of Dual-Drive Feed System Based on Virtual Axis-Electronic Cam Strategy	Zhanyun Deng, Hong Lu, Qi Liu, Lanqi Meng, Jiashun Dai, Qiong Liu
MSEC2022-85799	CFRP Milling and Drilling Process Monitoring by Using a Spindle-Integrated Three Axis Force Sensor	Jungsub Kim, Heebum Chun, Chabum Lee
<p>Wednesday, June 29,2022 13:30-15:00 K_G10</p> <p>06-12-02 MP_NMM- Advanced Machining and Metrology for Smart Manufacturing Technologies 2 Session Chair: Norikazu Suzuki (Chuo Univ) Session Co-chair: Takashi Matsumura (Tokyo Denki Univ)</p>		
MSEC2022-85451	A Prediction Model for High Efficiency Machining Conditions Based on Machine Learning (Presentation only)	Kengo Kawai, Naruhiro Irino, Koji Iiyama, Atsushi Matsubara, Hajime Mizuyama, Kotaro Mori, Makoto Fujishima
MSEC2022-81047	A Voxel-Based End Milling Simulation Method to Analyze the Elastic Deformation of a Workpiece	Kazuki Kaneko, Jun Shimizu, Keiichi Shirase
MSEC2022-82356	Laser Micro Machining Using an Oblique Photonic Nanojet with Focused Laser Beam Irradiation	Tsutomu Uenohara, Makoto Yasuda, Kosei Yamamoto, Yasuhiro Mizutani, Yasuhiro Takaya
<p>Wednesday, June 29,2022 13:30-15:00 K_G12</p> <p>07-05-02 MS - Cloud Manufacturing and Industrial Internet towards Agile and Resilient Manufacturing during and after COVID Era 2 Session Chair: Xi Wang (KTH) Session Co-chair: Yujie Chen (Caterpillar Inc)</p>		
MSEC2022-85085	Digital Twin Platforms: Their Architecture and Functions	Huiyue Huang, Tang Ji, Xun Xu
MSEC2022-85135	Modeling and Model-Driven of Whole-System Based on MBSE: A Case of Internet of Things Platform	Hao Yang, Chun Zhao, Nana Shen, Wenzheng Liu, Lin Zhang
MSEC2022-85576	Operating System for Cyber-Physical Manufacturing (OSCM): A Flexible Event-Driven Shopfloor Information Platform for Advanced Manufacturing	Ricardo Toro Santamaria, Placid M. Ferreira
<p>Wednesday, June 29,2022 13:30-15:00 K_G5</p> <p>08-02-04 NMM - Advances in Micro- and Nano-scale Additive Manufacturing 4 Session Chair: Sourabh Saha (Georgia Tech) Session Co-chair: Ross Salary (Marshall Univ)</p>		
MSEC2022-86076	Minimizing Shrinkage in Microstructures Printed with Projection Two-Photon Lithography	Harnjoo Kim, Sourabh Saha
MSEC2022-85436	Experimental Characterization of the Mechanical Properties of Medical-Grade Dental Implants, Fabricated Using Vat-Photopolymerization Additive Manufacturing Process	Regan Raines, James Day, Roozbeh (Ross) Salary

<p>Wednesday, June 29,2022 15:20-16:50 R2077</p> <p>01-02-02 AM - Modeling and Simulation of Additive Manufacturing Processes 2 Session Chair: Yao Fu (Virginia Tech) Session Co-chair: Athanasios Iliopoulos (Naval Research Lab)</p>		
MSEC2022-85391	Effect of Powder Layer Thickness on Residual Stress in Laser Powder Bed Fusion of IN718	Elham Mirkoohi,Hong-Chuong Tran,Yu-Lung Lo,You-Cheng Chang,Hung-You Lin,Steven Liang
MSEC2022-85777	Modeling Maximum Stresses in Each Layer for Layer-by-Layer Deposition of the Direct Metal Laser Sintering Process for Different Scanning Patterns	Joseph Tang,Hayri Sezer,Nazmul Ahsan,Hossain Ahmed,Sudhir Kaul
MSEC2022-85382	Support Vector Machines for Classification of Direct Energy Deposition Standoff Distance for Improved Process Control	Zoe Klesmith,Nathan Devol,Molly Emig,Kyle Saleeby,Thomas Feldhausen,Thomas Kurfess,Katherine Fu,Christopher Saldana
<p>Wednesday, June 29,2022 15:20-16:50 K_G18</p> <p>01-04-03 AM-Advances in Additive Manufacturing of Polymers and Polymer Composites 3 Session Chair: Kun Fu (Univ. of Delaware) Session Co-chair: Yingbin Hu (Miami Unvi.)</p>		
MSEC2022-85758	Nanoporous Carbon Nanotube Coating for 3D Printing of High-Performance Continuous Carbon Fiber Reinforced Polymer Composites	John Pappas,Xiangyang Dong
MSEC2022-85586	Polymer Filament Extrusion Using LDPE Waste Polymer: Effect of Processing Temperature	Rajdeep Singh Devra,Nishkarsh Srivastava,Madhu Vadali,Amit Arora
MSEC2022-85702	Fused Deposition Modeling of Carbon Fiber Reinforced High-Density Polyethylene: Effects on Microstructure and Mechanical Properties	Partha Pratim Pandit,Chang Liu, Giancarlo Corti, Yingbin Hu
<p>Wednesday, June 29,2022 15:20-16:50 K_G20</p> <p>05-01-01 ME - Innovations in Equipment Design, Control and Automation 1 Session Chair: Chandra Nath (Majjker Corp) Session Co-chair: Keivan Ahmadi (Univ. of Victoria)</p>		
MSEC2022-85534	Precision Evaluation of Large Payload SCARA Robot for PCB Assembly	Andrew Nimon,Andriy Sherehiy,Moath Alqatamin,Danming Wei,Dan Popa
MSEC2022-85157	Estimating Milling Force from Vibration Measurements	Manish Joddar,Keivan Ahmadi
MSEC2022-85424	Machine Vision Tracking and Automation of a Solid Articulated Four Axis Microrobot (sAFAM)	Colin Warn,Andriy Sherehiy,Moath Alqatamin,Brooke Ritz,Ruoshi Zhang, Sri Chowdhury,Danming Wei,Dan Popa
<p>Wednesday, June 29,2022 15:20-16:50 K_G2</p> <p>05-02-03 ME- Dimensional Inspection Metrology in Advanced Manufacturing 3 Session Chair: Mario Valdez (Los Alamos National Lab) Session Co-chair: Rui Liu (Rocheser Inst. Of Technology)</p>		
MSEC2022-85794	In-Process Machining Process Monitoring Based on Impedance Model of Dielectric Coating Layer at Tool-Chip Interface	Heebum Chun, Jungsub Kim,Jungsoo Nam,Songhyun Ju, Chabum Lee
MSEC2022-85463	Challenges of Manufacturing and Metrology in Laser via Hole Drilling (Presentation only)	Gyu Ha Kim,Chun Moo Lee, Jae-Young Joo,Chabum Lee
MSEC2022-85584	Effect of Inherently Porous Structure Produced by Metal Fused Filament Fabrication on the Tribological Behavior of Lubricated Steel-Steel Contact	Rui Liu,Andrew Greeley,Shuhuan Zhang,Denis Cormier,Patricia Iglesias
<p>Wednesday, June 29,2022 15:20-16:50 K_G5</p> <p>06-02 MP - Advances in Nontraditional Manufacturing Processes Session Chair: Murali Sundaram (Univ of Cincinnati) Session Co-chair: Muhammad Jahan (Miami Univ)</p>		
MSEC2022-86042	1D Plasma Model for Electrical Discharge Machining in Deionized Water	Asif Tanveer.; Shiv Kapoor,Soham Mujumdar,Davide Curreli
MSEC2022-78600	Incremental Sheet Forming of the WKU Big Red Mascot	Asghar Rezasoltani,Matthew Crocker,Jeremy Rice,Avery Black

Wednesday, June 29,2022 15:20-16:50 K_G4		06-06-04 MP-AM- Advances in Metal Additive Manufacturing Processes 4 Session Chair: Saeed Farahani (Cleveland State Univ) Session Co-chair: Fuda Ning (SUNY - Binghamton)	
MSEC2022-85508	Effects of Flight Distance on Metal Microdroplet Depositing Behaviors in Laser-Induced Forward Transfer	Di Wu,Zijie Lu,Guohu Luo,Yongxiang Hu	
MSEC2022-85413	Experimental Analysis of Metal Inert Gas Based Wire Arc Additive Manufacturing of Aluminum Nanocomposite AA7075	Mason Darnell,Dennis Harwig,Xun Liu	
MSEC2022-85262	Thermal Analyses of Electrically Assisted Forming	Tyler Grimm,Laine Mears	
Wednesday, June 29,2022 15:20-16:50 K_G10		06-12-03 MP_NMM- Advanced Machining and Metrology for Smart Manufacturing Technologies 3 Session Chair: Naruhiro Irino (DMG Mori Co.) Session Co-chair: Norikazu Suzuki (Chuo Univ)	
MSEC2022-85026	Ultra-Fine Bubble (UFB) Inserted Novel Coconut Oil Based Metal Working Fluid (MWF) as a Sustainable Lubricant for Turning of Ti-6Al-4V	Krishan Wickramasinghe,Hiroyuki Sasahara	
MSEC2022-85192	Exploring the Role of Mechanochemical Effects in Cutting of Aluminum Alloys with Alcohols	Tatsuya Sugihara,Takuma Nomura,Toshiyuki Enomoto,Anirudh Udupa,Koushik Viswanathan, James Mann	
MSEC2022-85130	Time Domain Simulation of Turning Operations with Flank Textured Tool	Norikazu Suzuki,Tsubasa Fujinaka, Yuya Yokokawa	
Wednesday, June 29,2022 15:20-16:50 K_G12		07-05-03 MS - Cloud Manufacturing and Industrial Internet towards Agile and Resilient Manufacturing during and after COVID Era 3 Session Chair: Yuqian Lu (Univ of Auckland) Session Co-chair: Xi Wang (KTH)	
MSEC2022-83923	Proof of Authenticity Statistics from Multiple Perceptual Hash Comparisons: A Case Study	Michele Maasberg,Leslie G. Butler,Brendan Birch,Maia E. Trailer	
MSEC2022-86009	Deep Reinforcement Learning-Based Multi-Task Scheduling in Cloud Manufacturing with Different Task Arrival Modes	Yaoyao Ping, Yongkui Liu,Lin Zhang,Lihui Wang,Xun Xu	
MSEC2022-85769	A Dynamic Cloud Bayes Network-Based Cleaning Method of Multi-Source Unstructured Data	Chao Yin,Xinian Liao, Xiaobin Li	
Wednesday, June 29,2022 15:20-16:50 K_G5		MSEC 2022 KIMM Session on Mobile Machining System Innovative Machining Technology using Mobile Robots	
KIMM	An Introduction to Technologies for Mobile Machining System on Large Workpieces	Seung-Kook Ro	
KIMM	Development Of Walking Type Mobile Machines for High Performance Milling Operations	Chang-Ju Kim, Dae-Hyun Kim, Hong-Jin Jung and Seung-Kook Ro	
KIMM	3D Coordinate Measurement Based on Absolute Distance and Multilateration	Jeong Seok Oh, Quoc Khanh Nguyen, Seungman Kim, Seong-Heum Han, Seung-Kook Ro, Gyungho Khim	
UTK	Automated Coordinate System Identification and Transfer for CNC Machining	Tony Schmitz	
PURDUE UNIVERSITY	Calibration And Training of a Robotic Arm Using Cable Encoder and Interactive and Immersive Cyberphysical System (I ² CPS)	Huitaek Yun and Martin Jun	

NAMRC TECHNICAL SESSIONS-THURSDAY

Thursday, June 30,2022 Start: 9:10 R2082		NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 7 Session Chair:Tony Schmitz (U. Tennessee) Session Co-chair: Peng Wang (U. Kentucky)	
Paper 106	Residual stress and material flow in Friction Stir Welding of Gr2 Titanium T-joints: experimental and numerical investigation	Davide Campanella, Gianluca Buffa, Daniele Lamia and Livan Fratini	
Paper 23	Hybrid manufacturing of Invar mold for carbon fiber layup using structured light scanning	Aaron Cornelius, Leah Jacobs, Matthew Lamsey, Logan McNeil, William Hamel and Tony Schmitz	
Paper 90	Machined Surface Image Analysis for Process Instability Identification in Micromilling of Ti6Al4V	Sameer Taylur, Gururaja S, Kundan Kumar Singh and Brajesh Kumar Panigrahi	

Thursday, June 30,2022 Start: 9:10 R2070		NAMRC - TRACK 3 MATERIAL REMOVAL - Session 6 Session Chair:Jianzhi Li (U. Texas Rio Grande Valley) Session Co-chair: Jarred Heigel (Third Wave Systems)	
Paper 152	Geometric Modeling of Serrated Cutters for Endmilling Forces using Local Oblique Cutting and Rake Normal Correspondence	Raja Kountanya and Changsheng Guo	
Paper 165	Physics-based design for an impeller machining process	Jarred Heigel, Jeff Tessier, Jeff Tapparo, Tyler Roth and Kerry Marusich	
Paper 111	Ultrafast Laser Ablation of Inconel 718 for Surface Improvement	Sampson Canacoo, Enrique Contreras Lopez, Oscar Coronel, Farid Ahmed, Jianzhi Li and Anil Srivastava	

Thursday, June 30,2022 Start: 9:10 R1075		NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 9 Session Chair:Niechen Chen (Northern Illinois U.) Session Co-chair: Frank Pfefferkorn (U. Wisconsin-Madison)	
Paper 15	Origami-inspired infill pattern for additive manufacturing	Weijun Shen, Zhan Zhang, Gül Kremer and Hantang Qin	
Paper 105	Leak-tight Crack Repair for 304L Stainless Steel using Friction Surfacing	Hemant Agiwal, Hwasung Yeom, Kenneth A. Ross, Kumar Sridharan and Frank Pfefferkorn	
Paper 101	A new boundary interlock geometry design pattern to strengthen FDM part multi-material interface	Shivaram Kakaraparathi, Robert Tatara and Niechen Chen	

Thursday, June 30,2022 Start: 9:10 R2058		NAMRC-TRACK 5 SMART MANUFACTURING & CYBER-PHYSICAL SYSTEMS - Session 4 Session Chair:Shreyes Melkote (GaTech) Session Co-chair: George Galkin (Rutgers)	
Paper 69	Missing Surface Roughness Data filling with Physics-Guided Neural Network for Grinding Process.	Chen Li, Kshitij Bhatta, Qing Chang, Guoxian Xiao, Jorge Arinez and Hua-Tzu Fan	
Paper 139	Quantifying and modeling overheating using 3D pyrometry map in powder bed fusion	Vidita Gawade, George Galkin, Y.B. Guo and Weihong Guo	
Paper 26	Generative Modeling of the Shape Transformation Capability of Machining Processes	Xiaoliang Yan and Shreyes Melkote	

Thursday, June 30,2022 Start: 11:00 R2082		NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 8 Session Chair: Jun Ma (Norwegian University of Science and Technology) Session Co-chair: Shivaprasad Cherukupally (IIT Hyderabad)	
Paper 29	Template-free scalable fabrication of linearly periodic microstructure by controlling ribbing defects phenomenon during forward roll coating	Md Didarul Islam, Himendra Perera, Sekkappan Chockalingam, Matthew Phillips, Muh-Jang Chen, Yuxuan Liu, Saad Khan, Mohammed Zikry and Jong Eun Ryu	
Paper 96	Enhancement of Accuracy in Multi-Point Stretch Forming: Cushion Stretching	Shivaprasad Cherukupally, Praveen Konka and Venkata Reddy Nallagundla	
Paper 99	A new, flexible tool concept for rotary die stretch bending	Sigmund Arntsønn Tronvoll, Jørgen Blindheim, Jun Ma and Torgeir Welo	

Thursday, June 30,2022 Start: 11:00 R2070		NAMRC - TRACK 3 MATERIAL REMOVAL - Session 7 Session Chair:Soham Mujumdar (IIT Bombay) Session Co-chair: Sathyan Subbiah (IIT Madras)
Paper 125	Brittle fracture at the intersection of two single ductile scratches during grinding of silicon	Anmol Dhiman and Sathyan Subbiah
Paper 75	Toward Smart Manufacturing: Analysis and Classification of Cutting Parameters and Energy Consumption Patterns in Turning Processes	Ihab Ragai, Abdallah Abdallah, Hussein Abdeltawab, Feng Qian and Jeff Ma
Paper 118	Experimental Investigation of Powder-mixed Dielectrics for Electrical Discharge Machining	Prashant P. Singare and Soham Mujumdar
Thursday, June 30,2022 Start: 11:00 R1075		NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 10 Session Chair: Abishek B. Kamaraj (Kettering U.) Session Co-chair: Guha Manogharan (Penn State)
Paper 41	The effect of infill angle, build orientation, and void fraction on the tensile strength and fracture of 3D printed ASA via fused filament fabrication	Israd Jaafar, Logan Sanford, Abdennour Seibi and Anne Gohn
Paper 39	Investigating the effect of powder recoater blade material on the mechanical properties of parts manufactured using a powder-bed fusion process	Haley Fox, Abishek B. Kamaraj and Dana Drake
Paper 36	Effects of part orientation, printer selection, and infill density on mechanical properties and production cost of 3D printed flexural specimens	Ruiqi Chen, Liseli Baich, James Lauer, Debbie Senesky and Guha Manogharan
Thursday, June 30,2022 Start: 11:00 R2058		NAMRC-TRACK 5 SMART MANUFACTURING & CYBER-PHYSICAL SYSTEMS -Session 5 Session Chair: Qing Chang (U. Virginia) Session Co-chair:Shaopeng Liu (General Electric)
Paper 70	Production Loss Analysis in Mobile Multi-skilled Robot Operated Flexible Serial Production Systems	Kshitij Bhatta, Chen Li and Qing Chang
Paper 119	Minimax Registration for Point Cloud Alignment	Zhaohui Geng, Mauro Garcia and Bopaya Bidanda
Paper 157	Reinforcement Learning Enabled Self-Homing of Industrial Robotic Manipulators in Manufacturing	John Karigiannis, Philippe Laurin, Shaopeng Liu, Viktor Holovashchenko, Antoine Lizotte, Vincent Roux and Philippe Boulet
Thursday, June 30,2022 Start: 14:00 R2070		NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 9 Session Chair:Jihyun Lee (U. Calgary) Session Co-chair: Sang Won Lee (Sungkyunkwan U.)
Paper 55	A control strategy for incremental profile forming	Ryo Nakahata, Satyanarayana Seetharaman, Krishnaswamy Srinivasan and Erman Tekkaya
Paper 121	A Parametric Study on Milling Process of Multi-directional Carbon Fiber Reinforced Plastic (MD-CFRP) Composite Using Nano-solid Dry Lubrication	Jin Woo Kim, Jungsoo Nam, Bonsang Koo, Byung Kwon Kang and Sang Won Lee
Paper 14	Nonlinear disturbance observer-based compliance error compensation in robotic milling	Ali Khishtan, Zhanhao Wang, Seong Hyeon Kim, Simon Park and Jihyun Lee
Thursday, June 30,2022 Start: 14:00 R1075		NAMRC - TRACK 3 MATERIAL REMOVAL - Session 8 Session Chair: Laine Mears (Clemson) Session Co-chair:Yuebin Guo (Rutgers)
Paper 151	An Uncut Chip Thickness and Surface Finish Model for Contour Turning with a Corner and Edge Radiused Insert	Raja Kountanya and Changsheng Guo
Paper 163	A Study on Sustainable Cutting Fluid Solutions for Bandsawing Applications (Presentation Only)	Chandra Sekhar Rakurty and Nithin Rangasamy
Paper 67	Experimental and simulative analysis of an adapted methodology for decoupling tool wear in end milling	Nils Potthoff, Ankit Agarwal, Florian Wöste, Jan Liß, Laine Mears and Petra Wiederkehr

Thursday, June 30,2022 Start: 14:00 R2058		NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 11 Session Chair:Sven-Erik Lang (Saarland U.) Session Co-chair:Manikanta Grandhi (West Virginia U.)	
Paper 134	Microstructural Characterization and Properties of Laser-DED Built Oxide Dispersion Strengthened SS 316L	Manikanta Grandhi, Changyu Ma, Zhichao Liu and Bruce Kang	
Paper 49	A Comparative Tribo-Mechanical Behavior Analysis of Laser Cladded Nitronic 60 Coating Against Wrought Nitronic 60 Alloy	Sougata Roy, Niyanth Sridharan, Arup Gangopadhyay and Jun Qu	
Paper 62	Analysis of the Dynamic Behavior of a Structurally Optimized Gimbal-Mounted Workpiece Fixture in Precision Honing	Murat Güner, Sven-Erik Lang, Franziska Herter and Dirk Bähre	

Thursday, June 30,2022 Start: 14:00 R2077		NAMRC-TRACK 6 INDUSTRIAL APPLICATIONS&MANUFACTURING EDUCATION-Session 2 Session Chair: Ihab Ragai (Penn State) Session Co-chair: Anna Billey (West Virginia U.)	
Paper 85	Design, Manufacturing, and Finance – An Interdisciplinary Approach through Engineering and Business Partnership	Jeffrey Coy, Ihab Ragai, Steven Nozaki and Kristy Bunce	
Paper 131	Process Design for Assembly and Shipping of 41 Foot High-Speed Disk Tiller	Iqbal Shareef, Michael Phlamm and Christopher Martin	
Paper 48	Status Quo of Smart Manufacturing Curricula offered by ABET accredited Industrial Engineering programs in the US	Milica Babic, Anna Billey, Mike Nager and Thorsten Wuest	

MSEC TECHNICAL SESSIONS-THURSDAY

Thursday, June 30,2022 09:10-10:40 R2077		01-03-01 AM - Process Planning and Computational Methods for Additive Manufacturing 1 Session Chair: Yunbo Zhang (Rochester Inst. of Tech.) Session Co-chair: Tsz Ho (Concordia Univ.)	
MSEC2022-85701	Robot Trajectory Generation for Multi-Axis Wire Arc Additive Manufacturing	Prahar Bhatt, Zachary McNulty, Satyandra Gupta	
MSEC2022-78670	Non-Planar Slicing Method for Stress-Oriented Continuous Fiber Reinforcement in Fused Filament Fabricated Parts	Chih-Yu Chen, Leonard Freißmuth, Suat Mert Altug, David Colin, Matthias Feuchtgruber, Klaus Drechsler	
MSEC2022-78324	Using Iterative Learning Control to Improve the Accuracy of Desktop Fused Deposition Modeling Printers: An Experimental Case Study	Lawrence Funke, Matthew Opara	
Thursday, June 30,2022 09:10-10:40 K_G18		01-04-04 AM-Advances in Additive Manufacturing of Polymers and Polymer Composites 4 Session Chair: Xiangyang Dong (Missouri S&T Univ) Session Co-chair: Yayue Pan (Univ of Illinois - Chicago)	
MSEC2022-78358	Hierarchical Porous Structure Fabrication via Hybrid Stereolithography and Inkjet Printing with Sacrificial Liquid	Yeowon Yoon, Yang Xu, Yong Chen	
MSEC2022-85168	3d Printing of Highly Conductive PEDOT:PSS-Based Polymers	Jevon Plog, Xinnian Wang, Ketki Lichade, Alexander Yarin, Yayue Pan	
MSEC2022-85380	Separation Process Comparison of Hydrogel Film and Polytetrafluoroethylene Film in Vat Photopolymerization	Feimo Yang, Aamer Kazi, Caleb Liu, Bruce Tai	
Thursday, June 30,2022 09:10-10:40 K_G20		05-01-02 ME - Innovations in Equipment Design, Control and Automation 2 Session Chair: Burak Sencer (Oregon State Univ) Session Co-chair: Jian Cao (Northwestern Univ)	
MSEC2022-85305	Micro-Architected Lattice-Based Mesh for Fiber Filters: A Novel Additive Manufacturing Architecture for Molded Fiber Tooling	Jose Dominguez, Paloma Gonzalez	
MSEC2022-85494	Trajectory Control of 6-DOF Welding Robot Based on STM32	Dingzhong Li, Hong Lu, Yongquan Zhang, Zidong Wu, He Huang, Meng Liu, Shaojun Wang	
MSEC2022-86124	A Novel Heat-Assisted Three-Roll Incremental Rolling System for Flexible Rolling	Zilin Jiang, Qiang Zeng, Osman Anderoglu, Stuart Maloy, Kornel Ehmann, Jian Cao	
Thursday, June 30,2022 09:10-10:40 K_G2		06-04-01 MP - Laser-based Advanced Manufacturing and Material Processing 1 Session Chair: Wenda Tan (Univ. of Michigan) Session Co-chair: Xin Zhao (Clemson Univ)	
MSEC2022-86171	Analysis of the Heat-Affected Zone and Ablation Efficiency in Terms of Burst Mode Parameters During High Power Picosecond Laser Micromachining of Metals	Sijie Zhang, Yung Shin	
MSEC2022-86075	Experimental Investigation of Nanosecond Laser Modification of Bulk Metallic Glass	Jianfeng Ma, Muhammad Jahan, Shuting Lei, Mark Gueli	
MSEC2022-80716	Laser Shock Peening Induced Back Stress Mitigation in Rolled Stainless Steel	Veronica Over, Y. Lawrence Yao	
Thursday, June 30,2022 09:10-10:40 K_G4		06-07-01 MP-AMM - Advances in Processing of Polymers and Polymer Composites 1 Session Chair: Anasuya Sahoo (Univ of Minnesota) Session Co-chair: Kenan Song (Arizona State Univ)	
MSEC2022-85532	3D Printing and Mechanical Behavior of Anisogrid Composite Lattice Cylindrical Structures	Felicia Stan, Ionut-Laurentiu Sandu, Catalin Fetecau	
MSEC2022-85480	Autoclave Molding of Carbon Fiber Laminates With Interlaminar Carbon Nanotubes	Fabrizio Quadrini, Denise Bellisario, Leandro Iorio, Alice Proietti, Nicola Gallo, Loredana Santo	
MSEC2022-85065	Tooling Engineering and Its Role in Manipulating Fiber Spinning and Enabled Nanostructures	Weiheng Xu, Kenan Song	

<p>Thursday, June 30,2022 09:10-10:40 K_G10</p> <p>06-10-01 MP - Mechanics-Driven Approaches to Materials Manufacturing 1 Session Chair: Dinakar Sagapuram (TAMU) Session Co-chair: Koushik Viswanathan (Indian Institute of Science)</p>		
MSEC2022-85595	Double Interpolation to Achieve Linear Strain Path for AISI 1008 Steel Cruciform Specimen	Jordan Hoffman,Jinjin Ha,Brad Kinsey, Dilip Banerjee,Mark Iadicola
MSEC2022-85446	Random Grid-Based DIC Analysis of Plastic Flow Near Interfaces in Deformation Processing	Deepika Gupta,Koushik Viswanathan
MSEC2022-85209	Controlling Damage Evolution in Geometrically Identical Cold Forged Parts by Counter Pressure	Robin Gitschel,Oliver Hering,André Schulze, A. Erman Tekkaya
<p>Thursday, June 30,2022 09:10-10:40 R1086</p> <p>07-03-01 MS - Maximizing the Competitive Edge in Changeable Manufacturing Systems and Transformable Factories 1 Session Chair: Ahmed Azab (Univ of Windsor) Session Co-chair: Asif Khan (FCA)</p>		
MSEC2022-92201	Transforming Powertrain Manufacturing to Electrified Propulsion Systems to Support the Growing Electric Mobility Market (Invited Keynote)	
MSEC2022-81991	Solving the Open Route Capacitated Periodic Vehicle Routing Problem with Time Windows to Service Microgrids Powered by Uncertain Renewable Generation	Waleed Shawky,Ahmed Azab,Sally Kassem
<p>Thursday, June 30,2022 09:10-10:40 K_G12</p> <p>08-01-01 NMM -Advances in Micro and Nano Mechanical, Nontraditional, and Hybrid Manufacturing 1 Session Chair: Farid Ahmed (Univ. of Texas - RGV) Session Co-chair: Bashir Khoda (Univ of Maine)</p>		
MSEC2022-85601	Synthesizing and Printing of Tin Oxide Nanoparticles Using a Single Ultrafast Laser System: A Feasibility Study	Enrique Contreras Lopez,Farid Ahmed, Jianzhi Li
MSEC2022-85680	Size-Based Filtration of Poly-Disperse Micro-Particle by Dipping	Md Khalil, Bashir Khoda
MSEC2022-83719	Fabrication of Nanowire Using Glancing Angle Deposition	Chuang Qu,Shamus Mcnamara,Kevin Walsh
<p>Thursday, June 30,2022 11:00-12:30 R2077</p> <p>01-03-02 -AM - Process Planning and Computational Methods for Additive Manufacturing 2 Session Chair: Chi Zhou (Univ. of Buffalo) Session Co-chair: Jing Shi (Univ. of Cincinnati)</p>		
MSEC2022-85329	Surface Roughness Prediction for Additively Manufactured Ti-6Al-4V Components Based on Supervised Learning Models	Varad Maitra,Jing Shi
MSEC2022-85334	A Deterministic Inspection of Surface Preparation for Metalization	Shiva Shokri,Pooria Sedigh,Mehdi Hojjati, Tsz Ho Kwok
MSEC2022-85603	Controlled Wetting of Spread Powder and Its Impact on Line Formation in Binder Jetting	Colton Inkley,David Martin,Brennen Clark,Nathan Crane
<p>Thursday, June 30,2022 11:00-12:30 K_G18</p> <p>05-01-03 ME - Innovations in Equipment Design, Control and Automation 3 Session Chair: Martin Jun (Purdue Univ) Session Co-chair: Ben Wang (Wuhan Univ of Technology)</p>		
MSEC2022-85515	Dynamic Simulation Analysis of Multi-Support Rotary Shaft System	Jiangnuo Mei,Yinhuan Zheng, Hong Lu,Zhangjie Li,Wei Zhang,Di Peng,Huang Lin,Qiong Liu
MSEC2022-85526	Analysis of Dynamic Characteristic for Gantry Mobile-Type Dual-Drive Machine	Min Hu,Hong Lu,Qi Liu, Jiashun Dai,Ben Wang,Shaojun Wang
MSEC2022-85458	Research on Synchronous Control Strategy of Dual-Drive Feed System Based on Fuzzy PID Control	Ben Wang,Hong Lu, Qi Liu,Shaojun Wang,Hengchen Panjiashun Dai

<p>Thursday, June 30,2022 11:00-12:30 K_G20</p> <p>06-07-02 MP-AMM - Advances in Processing of Polymers and Polymer Composites 2 Session Chair: Felicia Stan (Univ of Galati) Session Co-chair: Fabrizio Quadrini (Univ of Rome Tor Vergata)</p>		
MSEC2022-85618	Experimental Study of Microscopic Morphology and Material Property for Recycled Polyamide 12 Powder in Selective Laser Sintering	Mohammad Aman Ullah Al Amin,Yiran Yang,Md Humaun Kobir,Lei Di
MSEC2022-85464	Process Temperatures and Material Flow in Friction Stir Welding of High Density Polyethylene (HDPE)	Jamal Sheikh-Ahmad,Razi Ur Rehman,Suleyman Deveci,Fahad Almaskari
MSEC2022-80231	Coupled Diffusion-Deformation-Damage Model for Polymers Used in Hydrogen Infrastructure	Shank Kulkarni,Kyoo Sil Choi,Kevin Simmons
<p>Thursday, June 30,2022 11:00-12:30 R1086</p> <p>06-11-01 MP_MS_AM - Converging Manufacturing Techniques with Hybrid Manufacturing 1 Session Chair: Thomas Feldhausen (ORNL) Session Co-chair: Jason Jones (Hybrid Manufacturing Technologies)</p> <p>Invited Speaker Presentation</p>		
MSEC2022-85315	Evaluation of Process Parameters Modifications on Directed Energy Deposition Manufactured Parts Obtained in a Hybrid Additive Manufacturing Machine	Ana Beatriz Bertolucci Henriques,Paola Lazari De Aguiar,Raphael Galdino Dos Santos,Joice Miagava
<p>Thursday, June 30,2022 11:00-12:30 K_G2</p> <p>06-10-02 MP - Mechanics-Driven Approaches to Materials Manufacturing 2 Session Chair: Yang Guo (Michigan State Univ) Session Co-chair: Rachid M'Saoubi (Seco Tools AB)</p>		
MSEC2022-85120	Metal Powders via Surface Grinding: Applicability and Performance Evaluation for Laser Sintering	Harish Singh Dhami,Priti Ranjan Panda,Puli Saikiran, Koushik Viswanathan
MSEC2022-85024	Vibration Reduction in Robotic Milling Through Spindle Speed Modulation	Dominic Huschke,Shreyes Melkote
MSEC2022-85293	Primary Chatter and Limiting Chip Load in Turning Under Negative Process Damping	Ming-Jen Hsu,Junnjyh Wang
<p>Thursday, June 30,2022 11:00-12:30 K_G4</p> <p>07-03-02 MS - Maximizing the Competitive Edge in Changeable Manufacturing Systems and Transformable Factories 2 Session Chair: Mohamed Gadalla (Alabama A&M Univ) Session Co-chair: Ahmed Azab (Univ of Windsor)</p>		
MSEC2022-85306	Global Disruption of Semiconductor Supply Chains During Covid-19: An Evaluation of Leading Causal Factors	Aamirah Mohammed,Sardar Asif Khan
MSEC2022-83098	Decision Support for Siting of a Manufacturing System Given Politically Unstable Economies Using a Quality and Machine Learning Approach	Mohamed Gadalla,Ahmed Azab
MSEC2022-85358	Finding Robust Pareto-Optimal Solutions Over Time for Dynamic Disassembly Sequence Planning	Xin Zhang,Yilin Fang,Quan Liu
<p>Thursday, June 30,2022 11:00-12:30 K_G10</p> <p>07-06-01 MS_LCE - Smart and Sustainable Manufacturing 1 Session Chair: Huitaek Yun (In-Mac) Session Co-chair: Haiyue Wu (Purdue Univ)</p>		
MSEC2022-84878	Embrace the Imperfection: How Intrinsic Variability of Roll-to-Roll Manufactured Environmental Sensors Enable Self-Calibrating, High-Precision Quorum Sensing	Ajanta Saha,Sarath Gopalakrishnan,Jose Waimin,Sotoudeh Sedaghat,Ye Mi,Nicholas Glassmaker,Mukkerem Cakmak,Ali Shakouri,Rahim Rahimi,Muhammad A. Alam
MSEC2022-85553	Roll to Roll Manufacturing and In-Line Imaging and Characterization of Functional Films	Nicholas Glassmaker,Ye Mi,Mukerrem Cakmak, Ali Shakouri
MSEC2022-85392	Physics-Informed Machine Learning for Accelerated Testing of Roll-to-Roll Printed Sensors	S Chandra Mouli,Sotoudeh Sedaghat,Muhammed Ramazan Oduncu, Ajanta Saha,Rahim Rahimi,Muhammad A. Alam,Alexander Wei, Ali Shakouri,Bruno Ribeiro

08-01-02 NMM -Advances in Micro and Nano Mechanical, Nontraditional, and Hybrid Manufacturing 2 Session Chair: Ping Guo (Northwestern Univ) Session Co-chair: Farid Ahmed (Univ. of Texas - RGV)		
Thursday, June 30,2022 11:00-12:30 K_G12		
MSEC2022-85323	A Numerical Study on the Powder Flowability, Spreadability, Packing Fraction in Powder Bed Additive Manufacturing	Yeasir Mohammad Akib,Hsan Marzbanrad,Farid Ahmed,Ianzhi Li
MSEC2022-85544	Hydrogel and Graphene Embedded Piezo Resistive Microcantilever Sensor for Solvent and Gas Flow Detection	Dipannita Ghosh,Md Ashiqur Rahman,Ali Ashraf,Nazmul Islam
MSEC2022-80859	Thermoplastic Forming Process for Manufacturing Surgical Knife Blade Edges of Arbitrary Geometry	Nattasit Dancholvichit, Srinivasa Salapaka,Shiv Kapoor
01-03-03 AM - Process Planning and Computational Methods for Additive Manufacturing 3 Session Chair: Tsz Ho (Concordia Univ.) Session Co-chair: Jida Huang (Univ. of Illinois- Chicago)		
Thursday, June 30,2022 14:00-15:30 K_G18		
MSEC2022-85787	A Modified Schlieren System for In-Situ Voxel Growth Observation in Projection-Based Stereolithography Process	Aditya Chivate, Chi Zhou
MSEC2022-85541	Mechanical Profiles and Printability of Cellular Structures	Sina Rastegarzadeh,Samuel Muthusamy,Jida Huang
MSEC2022-85307	Tiling of Cellular Structures Into 3D Parts According to the Density Values of SIMP Topology Optimization	Damla Özkapıcı Helvacı,Ulaş Yaman
05-01-04 ME - Innovations in Equipment Design, Control and Automation 4 Session Chair: Chandra Nath (Majjker Corp) Session Co-chair: Satyandra Gupta (USC)		
Thursday, June 30,2022 14:00-15:30 K_G20		
MSEC2022-85952	Visual Servo Based Trajectory Planning for Fast and Accurate Sheet Pick and Place Operations	Omey Manyar,Alec Kanyuck,Bharat Deshkulkarni, Satyandra Gupta
MSEC2022-85519	Machine Setup Abnormality Detection Using Machine Vision and Deep Learning	Sahil J Choudhari,Swarit Anand Singh,Aitha Sudheer Kumar,Kaushal A Desai
MSEC2022-85527	A Novel Welding Method for Repairing Surface Defects of Large-Type Rotary Machinery Based on Line Structured Light Detection	Hao Fu,Hong Lu,Yongquan Zhang,Zidong Wu, He Huang,Shijie Liu,Shaojun Wang
06-04-02 MP - Laser-based Advanced Manufacturing and Material Processing 2 Session Chair: Xin Zhao (Clemson Univ) Session Co-chair: Wenda Tan (Univ. of Michigan)		
Thursday, June 30,2022 14:00-15:30 K_G2		
MSEC2022-85224	Effect of Metal Mixing on Mechanical Performance of Laser Keyhole Welding of Nickle and Copper	Wenkang Huang,Wenda Tan,Wayne Cai, Jennifer Bracey
MSEC2022-85222	Bidirectional Bending of Thin Metals with a Femtosecond Laser	Bryce Tessmann,Kewei Li,Xin Zhao
MSEC2022-85829	Design of Micro Scale Periodic Surface Textures by Pulsed Laser Melting and Its Influence on Wettability	Rohit Gupta, Justin Hijam, Rama Balhara, Madhu Vadali
06-11-02 MP_MS_AM - Converging Manufacturing Techniques with Hybrid Manufacturing 2 Session Chair: Christopher Saldana (Georgia Tech) Session Co-chair: Thomas Feldhausen (ORNL)		
Thursday, June 30,2022 14:00-15:30 K_G4		
MSEC2022-81641	Analysis of Conduction Cooling Strategies for Wire Arc Additive Manufacturing	Lauren Heinrich,Thomas Feldhausen,Kyle Saleeby,Christopher Saldana,Thomas Kurfess
MSEC2022-85310	Net-Shape Tensile Specimens as Representatives of Material Properties of Metal Additive Manufacturing: Evaluation and Correction Factor	Nicholas Bass,Sagar Jalui,Guha Manogharan
MSEC2022-80707	Effects of Process Parameters on Thin-Wall Substrate WAAM Deposition Geometry	Austen Thien,Jesse Goodwin,Christopher Saldana

Thursday, June 30,2022 14:00-15:30 K_G10		07-06-02 MS_LCE - Smart and Sustainable Manufacturing 2 Session Chair: Ali Shakouri (Purdue Univ) Session Co-chair: Huitaek Yun (In-Mac)	
MSEC2022-85440	Visualization Error Analysis for Augmented Reality Stereo Video See-Through Head-Mounted Displays in Industry 4.0 Applications	Wenhao Yang,Yunbo Zhang	
MSEC2022-85678	Development and Evaluation of a Computer Vision System for Assembly Bolt Pattern Traceability and Poka-Yoke	Eric Kozikowski,Nathan Hartman, Jorge D. Camba	
MSEC2022-85638	Thin-Film Nitrate Sensor Performance Prediction Based on Image Analysis and Credibility Data to Enable a Certify as Built Framework	Xihui Wang,Ajanta Saha, Ye Mi, Ali Shakouri,Muhammad Alam,George Chiu, Jan Allebach	
Thursday, June 30,2022 14:00-15:30 K_G12		08-01-03 NMM -Advances in Micro and Nano Mechanical, Nontraditional, and Hybrid Manufacturing 3 Session Chair: Bashir Khoda (Univ. of Maine) Session Co-chair: Ping Guo (Northwestern Univ)	
MSEC2022-80096	Effect of Porosity on Tool Wear During Micromachining of Additive Manufactured Titanium Alloy	Vinay Varghese,Soham Mujumdar	
MSEC2022-85839	Mechanical and Metallurgical Characterization of Ultrafine Grained Titanium Laminates Developed by LSEM	Pushpinder Kumar,Ravinder Singh Joshi,Rohit Kumar Singla	
MSEC2022-85703	A Study on the Effect of Nozzle Geometrical Parameters on Supersonic Cold Spraying of Droplets	Semih Akin,Puyuan Wu,Chandra Nath, Jun Chen, Martin Byung-Guk Jun	

NAMRC TECHNICAL SESSIONS -FRIDAY

<p>NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 10 Friday, July 1,2022 Start: 8:40 R2082 Session Chair:Hitomi Yamaguchi (U. Florida) Session Co-chair:Andreas Rohrmoser (Friedrich-Alexander-Universität Erlangen-Nürnberg)</p>		
Paper 161	Novel Jominy Test Method to Characterize Residual Stress and Hardenability with Intensive Quenching (Presentation Only)	Gopal Nadkarni, Joshua Ramirez, Daniel Tschudy, James Mckita, Chandra Sekhar Rakurty, Nithin Rangasamy and Jason Meyer
Paper 91	Experimental Evaluation of the Feasibility and Reproducibility of a Novel Multi-step Forming Process for Cu-OFE Micro Gear Manufacturing Compared to Macro-scale Forming	Andreas Rohrmoser, Martin Kraus, Miriam Leicht and Marion Merklein
Paper 114	Study of forming mechanics of magnetic field-assisted single point incremental forming	Dylan Pinard, David R. Skelton, Marco Gucciardi, Gianluca Buffa, Livan Fratini and Hitomi Yamaguchi
<p>NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 12 Friday, July 1,2022 Start: 8:40 R2070 Session Chair: Zhijian Pei (Texas A&M) Session Co-chair: Jing Shi (U. Cincinnati)</p>		
Paper 56	Post-machining allowance optimization of directed energy deposited impeller blades using point cloud registration	Liang Hou, Jing Guo and Yun Chen
Paper 73	3D Printing of frontal-polymerized multiscale epoxy thermoset and composites	Zimeng Zhang, Chongjie Gao, Ruochen Liu, Jingjing Qiu, Shiren Wang and Zhijian Pei
Paper 107	Study of microstructure and properties of in-situ alloyed AlCoCrFeNi(Y) high-entropy alloy by laser directed energy deposition method	Roman Savinov, Yutai Su, Jin Wang, Yachao Wang and Jing Shi
<p>NAMRC - TRACK 4 ADDITIVE MANUFACTURING - Session 13 Friday, July 1,2022 Start: 8:40 R1075 Session Chair: Bruce Tai (Texas A&M) Session Co-chair: Dhruv Bhate (Arizona State)</p>		
Paper 7	An Investigation in Tone Characteristics of 3D Printed Ukulele Sound Chambers	Joshua Riefer, Bruce L. Tai and Jyhwen Wang
Paper 136	Powder-borne porosity in directed energy deposition	Jennifer Bennett, Samantha Webster, John Byers, Olivia Johnson, Sarah Wolff, Kornel Ehmann and Jian Cao
Paper 45	Section Area Estimation Methods for Determining the Mechanical Properties of Laser Powder Bed Fusion Thin Wall Structures	Paul Paradise, Shawn Clonts, Sridhar Niverty, Mandar Shinde, Austin Suder, Tyler Smith, Thomas Broderick, Mark Benedict, Nikhilesh Chawla and Dhruv Bhate
<p>NAMRC-TRACK 5 SMART MANUFACTURING & CYBER-PHYSICAL SYSTEMS- Session 6 Friday, July 1,2022 Start: 8:40 R1011 Session Chair:Jianjing Zhang (Case Western Reserve) Session Co-chair: Robert F. Maack (U. Wuppertal)</p>		
Paper 98	Contamination Factor Prediction Using Contrived Data for Bearing Useful Life Estimation	Ethan Wescoat, Joshua Bradford, Matthew Krugh and Laine Mears
Paper 94	Reducing the Sim2Real-Gap in Extrusion Blow Molding using Random Forest Regressors	Robert F. Maack, Constantin Waubert de Puiseau, Anna Sokolova, Haile Atsbha, Hasan Tercan and Tobias Meisen
Paper 53	Process Monitoring: Distinguishing Defect Shapes by Strain Field Signatures	Saurabh Basu, Christopher McComb, Mustafa Rifat, Hongtao Sun and Soundar Kumara
<p>NAMRC - TRACK 2 MANUFACTURING PROCESSES - Session 11 Friday, July 1,2022 Start: 10:30 R2082 Session Chair:Jingyan Dong (North Carolina State) Session Co-chair:Miguel Saez (General Motors)</p>		
Paper 155	Optimization of GMAW Process Variables to Minimize Thermal Distortion	Miguel Saez, Wayne Cai, Hyunsung Choi, Patrick Spicer and Blair Carlson
Paper 46	Direct electrohydrodynamic printing of aqueous silver nanowires ink on hydrophobic substrates for flexible and stretchable electronics	Ping Ren and Jingyan Dong
Paper 84	Interaction analysis of a notching and cyclic bending process	Alina Biallas and Marion Merklein

Friday, July 1,2022 Start: 10:30 R2070		NAMRC-TRACK 5 SMART MANUFACTURING & CYBER-PHYSICAL SYSTEMS-Session 7 Session Chair:Zhaohui Geng (UT Rio Grande) Session Co-chair: Aaron Cornelius (U. Tennessee)
Paper 149	Physics-based Detection of Cyber-Attacks in Manufacturing Systems: A Machining Case Study	Md Habibor Rahman and Mohammed Shafae
Paper 43	Automated Posture Positioning for High Precision 3D Scanning of a Freeform Design using Bayesian Optimization	Zhaohui Geng and Bopaya Bidanda
Paper 24	A machining digital twin for hybrid manufacturing	Jake Dvorak, Aaron Cornelius, Gregory Corson, Ross Zamoski, Leah Jacobs, Joshua Penney and Tony Schmitz

Friday, July 1,2022 Start: 10:30 R1075		NAMRC-TRACK 6 INDUSTRIAL APPLICATIONS & MANUFACTURING EDUCATION -Session 3 Session Chair: Dalong Gao (General Motors) Session Co-chair: Jake Dvorak (U. Tennessee)
Paper 44	An Asynchronous Process for Flexible Volume Body Shop Subassemblies in High Throughput Plants	Dalong Gao
Paper 33	America's Cutting-Edge CNC machining and metrology training	Tony Schmitz, Aaron Cornelius, Jake Dvorak, Jose Nazario, Emma Betters, Gregory Corson, Scott Smith, Craig Blue, Joannie Harmon, Mark Morrison, Tyler Blevins, and John Hopkins

MSEC TECHNICAL SESSIONS-FRIDAY

<p>Friday, July 1,2022 08:40-10:10 R2058</p> <p>01-05-01 AM- Additive Manufacturing of Ceramics, Concretes, and Ceramic Composites 1 Session Chair: Chao Ma (TAMU) Session Co-chair: Avishek Ghosh (Loughborough Univ)</p>		
MSEC2022-85492	Printing Tubes Using Digital Glass Forming	Nicholas Capps,Jonathan Goldstein,Kiva Ford,Edward Kinzel
MSEC2022-85353	3D Printing of Artificial Martian Clay (JMSS-1) for In-Situ Resource Utilization on Mars	Avishek Ghosh,Jean-Jacques Favier
MSEC2022-85772	Process Optimization for Hydrothermal-Assisted Jet Fusion Additive Manufacturing of Ceramics	Fan Fei,Levi Kirby,Xuan Song
<p>Friday, July 1,2022 08:40-10:10 R2077</p> <p>04-01-01 LCE - Advances in Smart Manufacturing for Resiliency and Sustainability across the Product Life Cycle 1 Session Chair: Daniel Cooper (Univ. of Michigan) Session Co-chair: Barbara Linke (Univ of California - Davis)</p>		
MSEC2022-85536	Electric Vehicle Battery End-of-Use Recovery Management: Degradation Prediction and Decision Making	Yixin Zhao,Sara Behdad
MSEC2022-85263	Product Life-Cycle Energy Framework in Friction Scenarios	Barbara Linke,Shivam Gupta
MSEC2022-84900	The Effect of Composition, Geometry and a Novel Tool Design on Metal Recovery During Aluminum Process Scrap Remelting	Jiankan Liao,Ashvin Sharma,Daniel Cooper
<p>Friday, July 1,2022 08:40-10:10 K_G18</p> <p>03-01-01 BM- Advances in Biomanufacturing of Engineered Tissues and Organs 1 Session Chair: Yifei Jin (Univ of Nevada) Session Co-chair: Kenan Song (Arizona State Univ)</p>		
MSEC2022-85372	Developing Hybrid Hydrogels for Full-Scale Scaffold Fabrication Using Extrusion-Based Bio-Printing Process	Cartwright Nelson,Slesha Tuladhar,Md Ahasan Habib
MSEC2022-85437	Investigation of the Influence of Hydroxyapatite and Polysaccharide Concentration on the Mechanical Properties of Bone Scaffolds, Fabricated Using Freeze Drying Process	Tanner Ekstrom,James Day,Roozbeh (Ross) Salary
MSEC2022-85062	3D Printed Pelvic Organ Prolapse (POP) Tissue Scaffolds	Yuxiang Zhu,Dharneedar Ravichandran,Enan Song
<p>Friday, July 1,2022 08:40-10:10 K_G20</p> <p>06-03-01 MP - Tool Wear Mechanisms, Measurements, and Monitoring 1 Session Chair: Rui Liu (Rochester Inst. Of Technology) Session Co-chair: Christopher Saldana (Georgia Tech)</p>		
MSEC2022-85449	Digital Twin-Based Tool State Prognosis Model for Drilling Machines	Sunidhi Dayam,Kaushal A Desai
MSEC2022-85339	Pass-Wise Tool Wear Prediction in Turning Based on Long Short-Term Memory Algorithm Using Current Signal	Benvolence Chinomona,Chunhui Chung,Po-Chieh Wang,
MSEC2022-85186	Indirect Tool Condition Monitoring Using Ensemble Machine Learning Techniques	Alexandra Schueller, Christopher Saldana
<p>Friday, July 1,2022 08:40-10:10 K_G2</p> <p>06-08 MP - Advances in Assisted and Augmented Manufacturing Processes Session Chair: Meng Zhang (Kansas State Univ) Session Co-chair: Weilong Cong (Texas Tech Univ)</p>		
MSEC2022-83972	Identification of Defects in Robotic Sealing Fillet Application Using Image Processing Techniques	José Oliveira Cruz Neto,Matheus Chiaramonte Rocha,Sidney Bruce Shiki,Gustavo Franco Barbosa,Roberto Santos Inoue, Yayue Pan
MSEC2022-85205	Experimental and Numerical Investigation of Heat Assisted Incremental Sheet Forming Process of Magnesium Alloy	Narinder Kumar,Mohit Mahala,Anupam Agrawal
MSEC2022-85554	Acoustic Emission Sensors to Monitor the Early Onset of Necking During Uniaxial Tension	Madhav Baral,Ali Al-Jewad,Alexander Breunig, Jinjin Ha,Peter Groche,Yannis Korkolis, Brad Kinsey

<p>Friday, July 1,2022 08:40-10:10 K_G4</p> <p>07-06-03 MS_LCE - Smart and Sustainable Manufacturing 3 Session Chair: Chandra Nath (Majker Corp) Session Co-chair: Ali Shakouri (Purdue Univ)</p>		
MSEC2022-85833	Assessing the Impact of Real-Time Price Prediction Quality on Demand Response Management for Sustainable Smart Manufacturing	Lingxiang Yun,Lin Li
MSEC2022-84064	What Role Does Maintenance Play in Achieving Sustainability in Manufacturing? A Scoping Literature Review	Christina Bredebach
MSEC2022-85513	Development of an Interactive Digital Twin for Directed Energy Deposition (DED) Process	Inwoong Noh,Hyewon Shin,Youngwoon Choi,Yongho Lee,Yongjae Jeon,Sang Won Lee
<p>Friday, July 1,2022 08:40-10:10 K_G10</p> <p>08-01-04 NMM -Advances in Micro and Nano Mechanical, Nontraditional, and Hybrid Manufacturing 4 Session Chair: Chandra Nath (Majker Corp) Session Co-chair: Satyandra Gupta (USC)</p>		
MSEC2022-85950	Using an Articulated Industrial Robot to Perform Conformal Deposition with Mesoscale Features	Ying Cai,Prahar Bhatt,Hangbo Zhao,Satyandra Gupta
MSEC2022-83720	Synthesis of Nano-Dots and Lines by Glancing Angle Deposition with Corrals	Chuang Qu,Shamus Mcnamara,Kevin Walsh
MSEC2022-85165	Effects of Pressure on Reusable Self-Assembled Microsphere Masks for Microsphere Photolithography	Chen Zhu,Edward Kinzel
<p>Friday, July 1,2022 10:30-12:00 R1011</p> <p>01-05-02 AM- Additive Manufacturing of Ceramics, Concretes, and Ceramic Composites 2 Session Chair: Weilong Cong (Texas Tech Univ) Session Co-chair: Xuan Song (Univ. of Iowa)</p>		
MSEC2022-85747	Analytical Study of Shear-Thinning Fluid Flow in Direct Ink Writing Process	Zipeng Guo,Fan Fei,Xuan Song,Chi Zhou
MSEC2022-85766	Characterization of Stress Shielding in Pressure-Assisted Ceramic Binder Jetting	Levi Kirby,Fan Fei,Xuan Song
MSEC2022-85805	3D Printing of Designed Ultra-Low Loss Microwave Dielectrics for Beyond 5G Applications	Avishek Ghosh
<p>Friday, July 1,2022 10:30-12:00 R2058</p> <p>03-01-02 BM- Advances in Biomanufacturing of Engineered Tissues and Organs 2 Session Chair: Roozbeh Salary (Marshall Univ) Session Co-chair: MD Habib (Keene State College)</p>		
MSEC2022-85685	3D Co-Printability of PCL and Hybrid Hydrogels	Connor Quigley,Md Ahasan Habib
MSEC2022-82866	Embedded 3d Printing of Pdms-Based Microfluidic Chips for Biomedical Applications	Yifei Jin,Weijian Hua,Kellen Mitchell,Lily Raymond,Naima Valentin,Ryan Coulter
MSEC2022-85700	Pre-Crosslinked Hybrid Hydrogels for 3D Bio-Printing Process: Rheological Analysis	Slesha Tuladhar,Cartwright Nelson,Md Ahasan Habib
<p>Friday, July 1,2022 10:30-12:00 R2077</p> <p>04-01-02 LCE - Advances in Smart Manufacturing for Resiliency and Sustainability across the Product Life Cycle 2 Session Chair: Julius Schoop (Univ. of Kentucky) Session Co-chair: Sara Behdad (Univ. of Florida)</p>		
MSEC2022-85403	Automatic Screw Detection and Tool Recommendation System for Robotic Disassembly	Xinyao (Cynthia) Zhang,Kareem Eltouny,Xiao Liang,Sara Behdad
MSEC2022-80857	An Approach to Extend the Digital Thread from Requirements to Model Geometry	Jiwei Zhou, Jorge D. Camba,Nathan Hartman,Zhongtian Li
MSEC2022-85383	Optimization-Based Disassembly Sequence Planning Under Uncertainty for Human-Robot Collaboration	Hao-Yu Liao,Yuhao Chen,Boyi Hu,Sara Behdad

<p>Friday, July 1,2022 10:30-12:00 K_G18</p>		
<p>06-03-02 MP - Tool Wear Mechanisms, Measurements, and Monitoring 2 Session Chair: Patrick Kwon (Michigan State Univ) Session Co-chair: Rui Liu (Rochester Inst. Of Technology)</p>		
MSEC2022-85632	A Machinability Study of Coated Inserts for Turning Ti-6Al-4V	Patrick Kwon,Ryan Khawarizmi,Thomas Bieler,Yang Guo
MSEC2022-85822	An Investigation of Chipping Propagation on Carbide Tool in End Milling for Prototyping	Shuhuan Zhang,Rui Liu
MSEC2022-78527	A Novel Sensor System for High-Frequency Dynamic Force Measurements in Machining (Presentation only)	Parth Dave,Shwetabh Yadav,Rachid M'saoubi,Dinakar Sagapuram
<p>Friday, July 1,2022 10:30-12:00 K_G20</p>		
<p>06-09 MP - Physics-Informed Data-Driven (PIDD) models for Advanced Manufacturing and Inspection Processes Session Chair: Ankit Agarwal (Clemson Univ) Session Co-chair: Laine Mears (Clemson Univ)</p>		
MSEC2022-86659	Exploring Surface Texture Quantification in Piezo Vibration Striking Treatment (PVST) Using Topological Measures	Melih Yesilli,Max Chumley,Jisheng Chen,Firas Khasawneh, Yang Guo
MSEC2022-84977	Simulating Residual Stress at Critical Features of Straightened Hollow Transmission Shafts	Michael Chodubski
MSEC2022-85621	Extracting the In-Process Structural Dynamics Parameters in Micro-Milling Operations	Maryam Hashemitaheeri,Rinku Mittal,Harish Cherukuri,Ramesh Singh
<p>Friday, July 1,2022 10:30-12:00 K_G2</p>		
<p>07-06-04 MS_LCE - Smart and Sustainable Manufacturing 4 Session Chair: Haiyue Wu (Purdue Univ) Session Co-chair: Chandra Nath (Majiker Corp)</p>		
MSEC2022-84712	Development of Autonomous Robotic Bin Picking System Using Convolutional Neural Network (CNN) Initially Trained by Human Skills	Huitaek Yun, Jinho Park,Martin Jun
MSEC2022-85331	Machine Straightness Error Measurement Based on Optical Fiber Fabry-pérot Interferometer Monitoring Technique	Xingyu Fu,Ngfeng Zhou,Huitaek Yun,Eunseob Kim,Siyang Chen,Martin Byung-Guk Jun
<p>Friday, July 1,2022 10:30-12:00 K_G4</p>		
<p>08-01-05 NMM -Advances in Micro and Nano Mechanical, Nontraditional, and Hybrid Manufacturing 5 Session Chair: Farid Ahmed (Univ. of Texas - RGV) Session Co-chair: Chandra Nath (Majiker Corp)</p>		
MSEC2022-85249	Ultrafast Laser-Induced Surface Structuring of Anti-Fouling Steel Surfaces for Biomedical Applications	Abhijit Cholkar,Ronan Mccann,David Kinahan,Dermot Brabazon
MSEC2022-85684	Ultrafast Laser Direct Writing of Conductive Patterns in Polyimide Substrate	Ishrat Jahan Biswas,Enrique Contreras Lopez,Farid Ahmed,Jianzhi Li
MSEC2022-85663	Ultrafast Laser Texturing of Metal Surfaces: Effects of Process Parameters on Surface Reflectance and Possibility of Hierarchical Structuring	Nishan Khadka, Yucheng Yang,John Haug,Milan Palei,Matthew Rosenberger,Anthony Hoffman,Edward Kinzel