



- The International Academy for Production Engineering
 - College International pour la Recherche en Productique
 - Internationale Akademie für Produktionstechnik



CIRP ICME '23 - 17th CIRP International Conference on



DICMAPI
University of Naples
Federico II

INTELLIGENT COMPUTATION IN MANUFACTURING ENGINEERING

Innovative and Cognitive Production Technology and Systems

12 - 14 July 2023, Ischia (Gulf of Naples), Italy



Joint Laboratory of
Excellence on Advanced
Production Technology
(Fh-IWU Chemnitz &
DICMAPI-UniNaples
Federico II)

Tuesday, July 11 - Conference Registration and Welcome

18.00 - 19.00	Conference Registration at Hotel Continental Ischia, Via M. Mazzella 80, Ischia
19.30	Welcome Reception and Get Together at 19.30, Hotel Continental Ischia

Wednesday, July 12 - Plenary Session: 9.15 - 11.00

CONFERENCE OPENING AND PLENARY SESSION

DAY 1			
08.00- 09.00	Late Registration		
09.15 - 11.00	Conference Opening and Greetings <i>R. Teti, CIRP ICME '23 Conference Chairman, Italy</i> Plenary Session Presentations <i>S. Melkote (USA), Enabling Intelligent Manufacturing Systems: From Industrial Robotics to Future Cyber Manufacturing Services</i> <i>N. Nishino (Japan), From Optimisation to Equilibrium Concept in Production: An Emergent Synthesis Approach</i> <i>L. Nele, D. Santoro, A. Caggiano (Italy), Assembly & Data Management Technologies for Factory Automation - R&D TOP Project</i> <i>R. Teti (Italy), A Modular Framework for Designing and Producing Biohybrid Machines – BioMeld, EC Horizon Europe Project</i>		

Coffee Break

Wednesday, July 12 - Morning Sessions: 11.30 - 13.15

DAY 1	SESSION A1	SESSION B1	SESSION C1
	Chairman: S. Melkote	Chairman: G. Bitsch	Chairman: M. Galetto
	Cutting Technologies I	Assembly I	Quality, Metrology & Testing I
11.30 - 11.45	Machining-Induced Distortion during Peripheral Milling of High Strength Aluminum Parts <i>Moritz M. Mayer, Michael Ott, Matthias Wimmer, Roman Hartl, Wolfram Volk, Michael F. Zaeh (Germany)</i>	Process Optimization in Process Planning using a Multidimensional Approach in the Automotive Assembly <i>Thomas Mayr, Marco F. Huber, Ralph Hensel, Mathias Keil (Germany)</i>	ML-Pipeline for the Quality Assessment of Screwdriving Processes <i>Martin Wende, Marcel Bender, Maik Frye, Dennis Grunert, Robert H. Schmitt (Germany)</i>
11.45 - 12.00	Cutting force estimation from machine learning and physics-inspired data-driven models utilizing accelerometer measurements <i>Gregory W. Vogl, Yongzhi Qu, Reese Eischens, Gregory Corson, Tony Schmitz, Jaydeep Karandikar, Scott Smith (USA)</i>	A human-centric preference-based workforce dispatching with Machine Learning using the example of an assembly process <i>Anja Kneissl, Günter Bitsch, Johannes L. Jooste (Germany)</i>	Development of Morphology to Support the Conception of Cognitive Assistance Systems for Quality Assurance in Product Audits <i>Dirk Schweers, Axel Börold, Michael Freitag (Germany)</i>
12.00 - 12.15	Active learning for the prediction of shape errors in milling <i>Berend Denkena, Marcel Wichmann, Markus Rokicki, Lukas Stürenburg (Germany)</i>	Development of a characterization and modeling method for Digital Twins in an assembly use case <i>Jan Molter, Sarah Zimmer, Lennard Margies, Martin Karkowski, Rainer Müller (Germany)</i>	Metrological integration and automation of surface topography measuring instruments on cobots <i>Giacomo Maculotti, Gianfranco Genta, Khurshid Aliev, Maurizio Galetto (Italy)</i>
12.15 - 12.30	Influence of a sub-zero metalworking fluid on the tribological behavior of CoCrMo alloys and WC-Co carbides <i>Kevin Gutzeit, Felix Grossmann, Benjamin Kirsch, Jan C. Aurich (Germany)</i>	Enhancing Manual Assembly Training using Mixed Reality and Virtual Sensors <i>Celia Redondo Verdú, Natalia Sempere Maciá, Mattias Strand, Magnus Holm, Bernard Schmidt, Jerry Olsson (Sweden)</i>	Evaluation Methodology for Interpretation Methods of Predictive Quality Models <i>Tobias Schulze, Daniel Buschmann, Robert H. Schmitt (Germany)</i>
12.30 - 12.45	A systematic approach for data acquisition for tool modelling and analysis of wear-dependent tool deflections during milling Inconel 718 <i>Nils Potthoff, Louisa Neumann, Petra Wiederkehr (Germany)</i>	Automatic Generation of Assembly Instructions by Analyzing Process Recordings – A Concept Overview <i>Peter Burggräf, Tobias Adlon, Fabian Steinberg, Florian Bröhl, Alexander Moriz, Carsten Engeln, Maximilian Schütz, Felix Jaworek (Germany)</i>	Geometric digital twins of long-living assets: uncertainty-aware 3D images from measurement and CAD data <i>Keno Moenck, Thorsten Schüppstuhl (Germany)</i>

12.45 – 13.00	Simulation-based collision detection for CNC machining using sensor-based image recognition <i>B. Denkena, M. Wichmann, T. Malek, R. Räger (Germany)</i>	Framework for Propagating Product Variability to Digital Assembly Instructions <i>Vasilios Zogopoulos, Dorothy Gors, Michiel Haemers, Nataliya Babych, Arno Claeys, Johannes Cottyn (Belgium)</i>	Creating Synthetic Datasets for Deep Learning used in Machine Vision <i>Iris Gräßler, Michael Hieb (Germany)</i>
13.00 – 13.15	Sensor-integrated clamping device for machining of AM components <i>Jan Liß, Petra Wiederkehr (Germany)</i>	Intelligent Order Release In Matrix-Structured Assembly Systems <i>Esben Schukat, Katharina Fughe, Jakob Amtmann, Felix Schönwasser, Tobias Adlon, Peter Burggräf (Germany)</i>	Structured-light 3D Scanning Performance in Offline and In-process Measurement of 3D Printed Parts <i>Moustapha Jadayel, Farbod Khameneifar (Canada)</i>
13.15 – 15.00	Lunch		

DAY 1		Wednesday, July 12 - Afternoon Sessions: 15.00 - 16.45		
	SESSION A2 Chairman: A. Marzano	SESSION B2 Chairman: D. Antonelli	SESSION C2 Chairman: G. Vogl	
	Cutting Technologies II	Assembly II & Additive Manufacturing I	Machine Tools & Special Machinery	
15.00 - 15.15	Intuitive toolpath planning in computer-aided manufacturing systems using artificial intelligence in a virtual reality environment <i>Lionel Damtew, Philipp Ganser, Tommy Venek, Thomas Bergs (Germany)</i>	Assembly workshops in virtual reality as an integral part of the assembly planning process <i>Patrick Rückert, Ann-Kathrin Götsche, Kirsten Tracht (Germany)</i>	CNC Machine Tool Focused Edge Computing in Manufacturing <i>Lea Tonejca, Christoph Mayer, Thomas Trautner, Gernot Mauthner, Friedrich Bleicher (Austria)</i>	
15.15 - 15.30	Deep Learning Approach for Enhanced Transferability and Learning Capacity in Tool Wear Estimation <i>Zongshuo Li, Markus Meurer, Thomas Bergs (Germany)</i>	Robotic assembly supported by feature-based vision system <i>Dario Antonelli, Khurshid Aliev (Italy)</i>	Multidimensional position-based monitoring of machining using references of multiple machine tools <i>Berend Denkena, Heinrich Klemme, Tobias H. Stiehl (Germany)</i>	
15.30 – 15.45	Influence of illumination on the image-based classification accuracy of wear on milling tools <i>Björn Papenberg, Sebastian Hogreve, Thore Bochardt, Carmen Bornholdt, Tobias Heinrich, Kirsten Tracht (Germany)</i>	Computer-based design and development of a fully automated assembly of aircraft doors made of thermoplastic composite material <i>Rayk Fritzsche, Erik Jaeger (Germany)</i>	Methodology for the automated digitization and probing of workpieces in a machining center by combining optical and tactile measurements <i>Tobias Siebrecht, Melina Wenzel, Petra Wiederkehr (Germany)</i>	
15.45 - 16.00	Improving dynamic process stability in finishing of thin-walled workpieces by optimal selection of stock shape <i>Pascal Kienast, L. Taner Tunç, Recep Koca, Ozan Ölgü, Philipp Ganser, Thomas Bergs (Germany)</i>	Assessing the Human Competence and Individual Support Level in Manual Assembly through Cognitive Assistance Systems <i>Klaus Fink, Anna Ziegler, C. Härdtlein, C. Berger, Rüdiger Daub (Germany)</i>	Data-driven long-term condition-based maintenance using anomaly detection under concept drift: A case study of an ultrasonic sieve machine <i>Feng Zhu, Nicolas Jourdan, Beatriz Bretones Cassoli, Joachim Metternich (Germany)</i>	
16.00 - 16.15	Finite element simulation of the mechanical loads during low frequency vibration-assisted drilling utilizing the CEL-method <i>L. Schumski, T. Tonn, L. Buss, J. Sölter, U. Fritsching, B. Karpuschewski (Germany)</i>	In-source dynamic beam shaping of Al alloys processed via LPBF: effect of novel beam profiles on surface roughness and microstructure <i>Francesco Galbusera, Leonardo Caprio, Barbara Previtali, Ali Gökhan Demir (Italy)</i>	Conception of a predictive maintenance system for forest harvesters from multiple data sources <i>Lazlo Fauth, Andreas Ligocki (Germany)</i>	
16.15 - 16.30	Layer-based information model for 5-axis milling processes using a GraphQL schema <i>Viktor Rudel, David Wichter, Sven Schiller, Georg Vinogradov, Aleksandra Müller, Philipp Ganser, Thomas Bergs (Germany)</i>	Handling of uncertainties in the design of sustainable Additive Manufacturing products by merging Design-for-X and Scenario-Technique <i>Iris Gräßler, Iryna Mozgova, Jens Pottebaum, Manuel Ott, Philipp Jung, Philipp Hesse (Germany)</i>	Generalizable AI Pipeline for the cost estimation of manufacturing system structures in special machine engineering <i>Max Eichenwald, Martin Karkowski, Rainer Müller (Germany)</i>	
16.30 - 16.45	Development of a Linear Integer Programming for Solving Cutting Stock Problem in the Manufacturing Industry <i>Ilesanmi Daniyan, Khumbulani Mpofu, Adefemi Adeodu (South Africa)</i>	Low-temperature tensile properties of meta-stable β titanium Ti-5Al-5V-5Mo-3Cr alloy fabricated by pulsed laser powder bed fusion <i>Akshay Ashok Benni, Francesco Galbusera, Ali Gökhan Demir, Barbara Previtali (Italy)</i>	Automated Configuration of Optimized Customer Specific Mechatronic Systems Using Behavior Models <i>Valentin Stegmaier, Tobias Eberhardt, Walter Schaaf, Nasser Jazdi, Michael Weyrich, Alexander Verl (Germany)</i>	
20.00	Garden Dinner at 20.00, Hotel Continental Ischia			

DAY 2			
<i>Thursday, July 13 - Morning Sessions: 9.00 - 13.00</i>			
	SESSION A3 Chairman: A. Caggiano	SESSION B3 Chairman: S. Bigot	SESSION C3 Chairman: A. Papavasileiou
	Cutting Technologies III	Additive Manufacturing II	Robotics & Human-Robot Collaboration I
09.00 - 09.15	Quality Control Loop for Tool Wear Compensation in Milling Process using Different Optimization Methods <i>Ali Bilen, Jan-Philipp Kaiser, Daniel Gauder, Florian Stamer, Gisela Lanza (Germany)</i>	A method for the predictive and automated detection of the shrink line location during the powder bed fusion of metals using a laser beam <i>Dominik Goetz, Daniel Wolf, Lukas Spano, Michael F. Zaeh (Germany)</i>	Comparison of Safety Mechanisms for Human-Robot Collaboration in Assembly using a Top-View RGB-D Camera System <i>Burak Vur, Christoph Petzoldta, Michael Freitag (Germany)</i>
09.15 - 09.30	Cutting of structured surface on pure titanium <i>Hirofumi Suzuki, Akinori Yui (Japan)</i>	Developing Rapid Metal AM deformations Prediction using CNN <i>Léopold Le Roux, Anthony Soroka, Ze Ji, Samuel Bigot (UK)</i>	Consideration of handedness in human-robot collaboration <i>Patrick Rückert, Mareike Tamke, Tara Eisfeld, Marcel Gäer, Janis Grzeschik, Tabea Preuß, Kirsten Tracht (Germany)</i>
09.30 - 9.45	Tool Failure Detection in CFRP/Ti6Al4V hybrid stacks drilling using Discrete Wavelet Transform <i>C. Domínguez-Monferrer, A. Guerra-Sancho, A. Caggiano, L. Nele, M.H. Miguélez, J.L. Cantero (Spain, Italy)</i>	An exploratory analysis on laser polishing of components by laser powder directed energy deposition <i>Giuseppe Vecchi, Gabriele Piscopo, Eleonora Atzeni, Alessandro Salmi (Italy)</i>	A modular framework of robot gripping tools for human robot collaborative production lines <i>A. Papavasileiou, S. Aivaliotis, P. Mparis, P. Mantas, S. Makris (Greece)</i>
9.45 - 10.00	Utilizing orthogonal cutting models to predict the fraction of shear plane heat into the workpiece for milling and turning <i>Lars Langenhorst, J. Sölter (Germany)</i>	Toward the Rapid Manufacturing of Lightweight Parts by Laser Directed Energy Deposition <i>Avelino Zapata, M. Spreitler, X. Fan Zhao, C. Bernauer, M. F. Zaeh (Germany)</i>	An interactive Augmented Reality based framework assisting operators in human-robot collaborative assembly operations <i>S. Aivaliotis, A. Papavasileiou, C. Konstantinou, T. Anastasiou, C. Gkournelos, S.Koukas, S. Makris (Greece)</i>
10.0 - 10.15	LCA involving process planning <i>Valentina König, Shehab Saleh, Deborah Rogiers, Franziska Lange (Germany)</i>	Analytic evaluation of the thermal conductivity at the conditions of the powder bed fusion with electron beam (PBF-EB) additive manufacturing process <i>Giovanni Rizza, Manuela Galati, Paolo Antonioni, Luca Iuliano (Italy)</i>	XAI-driven digital twin for cobot dynamic error compensation <i>Abhilash Puthanveetil Madathil, Xichun Luo, Yi Qin (Germany)</i>
10.15 - 10.30	A new benchmark dataset for machine learning applications in discrete manufacturing: CiP-DMD <i>Nicolas Jourdan, Tobias Biegel, Beatriz Bretones Cassoli, Joachim Metternich (Germany)</i>	Overheating detection in the powder bed fusion of metals using a laser beam through local thermal resistance analysis <i>David L. Wenzler, Kai-Uwe Beuerlein, Dominik Goetz, Michael F. Zaeh (Germany)</i>	Energy-oriented optimization of the task allocation for mobile robots <i>Christian Härdtlein, Hans Stadlbauer, Rüdiger Daub (Germany)</i>
10.30 - 10.45	A meta-learning strategy based on deep ensemble learning for tool condition monitoring of machining processes <i>Jose Joaquin Peralta Abadia, Mikel Cuesta Zabalauregui, Felix Larrinaga Barrenechea (Spain)</i>	A model for the rapid prediction of small feature width producible by Metal AM <i>Prospera Sonuo Sibanda, Michael Ryan, Samuel Bigot (UK)</i>	Systematic literature review on the acceptance of human-robot collaboration among assembly workers <i>Thamilini Puspanathan, Günter Bitsch, Louis Louw (Germany)</i>
10.45 - 11.15	Coffee Break		

DAY 2			
	SESSION A4 Chairman: Y. Xu	SESSION B4 Chairman: N. Nishino	SESSION C4 Chairman: B. Engel
	Production Systems I	“IWES” Symposium	Forming, Welding & Thermomechanical Processes
11.15 - 11.30	Intelligent Scheduling based on Discrete-Time Simulation using Machine Learning <i>Günter Bitsch, Pascal Senjic (Germany)</i>	Analysis of Medical Data and Machine-Learning Algorithms from the Perspective of Public-Goods Models of Data-Provision Decision Making <i>Masanori Fujita, Zhongyue Cheng, Simdy Dayana Rico Lugo, Ayato Kitadai, Yuwen Dai, Yusuke Fukasawa, Nariaki Nishino (Japan)</i>	Development of a hybrid-linear bending kinematic and calculation method for the prediction of bending radii and angles in swivel bending <i>Michael Schiller, Wolfram Hochstrate, Peter Frohn-Sörensen, Bernd Engel (Germany)</i>
11.30 - 11.45	A Fuzzy Synthesis Approach for Hierarchical Decision Analysis Applied to Repair Technique Selection for Aero-Engines Components <i>Nasser Amaitik, Christopher Buckingham, Ming Zhang, Yuchun Xu (UK)</i>	Price competition for service provision with different bargaining abilities <i>Jianyong Teng, Ryuichiro Ishikawa (Japan)</i>	Numerical Analysis of Process Parameters and Tool Geometry in Friction Stir Back Extrusion of Pure Aluminum <i>Mauro Carta, Pasquale Buonadonna, Mohamad El Mehtedi (Italy)</i>
11.45 - 12.00	Modular Cell Design Technology for CPF Production Line <i>Toshihiro Morisawa, Takahiro Nakano, Daiki Kajita (Japan)</i>	Survey on Stakeholder Cooperative Behavior for Designing Voluntary Medical Data Provision Motivation Mechanisms <i>Masanori Fujita, Yuwen Dai, Ayato Kitadai, Simdy Dayana Rico Lugo, Zhongyue Cheng, Nariaki Nishino (Japan)</i>	Investigation of transfer learning with changing machine, mold and material combinations in injection molding <i>Dimetri Kvaktun, Felix Mueller, Reinhard Schiffers (Germany)</i>

12.00 - 12.15	Representing Process Variants based on the Maximal Network Plan – Introducing XOR Decisions <i>Peter Hein, Hendrik Folkerts, Jan Cetric Wagner, Roland Larek (Germany)</i>	Forecasting the number of customers visiting restaurants in COVID-19 <i>Takashi Tanizaki, Takeshi Shimmura, Takayuki Kataoka (Japan)</i>	Intelligent parameter determination and quality control of an injection molding process <i>Sina Nahvi, Marco Schumann, Martin Dix, Philipp Klimant (Germany)</i>
12.15 - 12.30	Metaheuristic comparison of a simulation-based multi-criteria optimization method for rolling production smoothing <i>Felix Kamhuber, Thomas Sobottka, Paul Lindorfer, Fazel Ansari (Austria)</i>	Analysis of excellent service systems from co-creation and emergent synthesis perspective <i>Takeshi Takenaka (Japan)</i>	Study on the explainability of deep learning models for time series analysis in sheet metal forming <i>Marco Becker, Philipp Niemetz, Thomas Bergs (Germany)</i>
12.30 – 12.45	Integration of Autonomous Driving Functionalities for End-of-Line Production Transport Scenarios <i>Peter Burggräf, Tobias Adlon, Luis A. Curiel-Ramirez, Vishwas Jain (Germany)</i>	Meta-heuristic scheduling auction applying distributed genetic algorithm <i>Shota Suginochi, Takuya Nagai, Hajime Mizuyama (Japan)</i>	Study on material-data-driven process parameterization in fine blanking <i>Lucia Ortjohann, Andreas Peters, Jens Gerhard, Marco Becker, Philipp Niemetz, Thomas Bergs (Germany)</i>
12.45 – 13.00	Performance Analysis of Different Reward Functions in Reinforcement Learning for the Scheduling of Modular Automotive Production Systems <i>Jan Markus Gelfgren, Eric Tillmann Bill, Tim Luther, Simon Hagemann, Sigrid Wenzel (Germany)</i>	The impact of characteristic function of Shapley value mechanism in distributed machine learning environment for equipment diagnosis <i>Keiji Beppu, Shota Suginochi, Hajime Mizuyama (Japan)</i>	Application of a concept for ML-driven closed-loop quality control in laser beam welding <i>Nik Weisbrod, Joachim Metternich (Germany)</i>
13.00 - 13.15	A Knowledge Graph-based Learning Assistance Systems for Industrial Maintenance <i>Linus Kohl, Fazel Ansari (Austria)</i>	Automatic Measurement of Timber Diameter Using Image Processing <i>Ryo Yamaguchi, Ruriko Watanabe, Nobutada Fujii, Daisuke Kokuryo, Toshiya Kaihara, Yasuhiro Sunami (Japan)</i>	Analysis of the relationship between training data volume and model quality for surrogate models in physical simulations <i>Tom Röger, Ludwig Vogt, Tobias Friedrich, Johannes Schilp (Germany)</i>
13.15 – 15.00	Lunch		

DAY 2	Thursday, July 13 - Afternoon Sessions: 15.00 – 16.45		
	SESSION A5 Chairman: M. Hassan	SESSION B5 Chairman: A. Armani	SESSION C5 Chairman: J. Berger
	Cutting Technologies IV	Additive Manufacturing III	Robotics & Human-Robot Collaboration II
15.00 - 15.15	Automatized, holistic use of information from milling processes <i>Kai Mecke, Knut Barghorn, Jens Wellhausen (Germany)</i>	Defect Detection and Closed-loop Feedback Using Machine Learning for Fused Filament Fabrication <i>Amaris De La Rosa, Amir Armani, Marcia Golmohamadi (USA)</i>	Programming Environment for cobots using MR technology <i>Natalia Sempere Maciá, Celia Redondo Verdú, Bernard Schmidt, Magnus Holm (Sweden)</i>
15.15 - 15.30	A Generalized Multi-Stage Deep Machine Learning Framework for Tool Wear Level Prediction in Milling Operations <i>Mahmoud Hassan, Ayman Mohamed, Helmi Attia (Canada)</i>	Investigation on different laser beam profiles in high-speed directed energy deposition <i>Jacques Platz, Marc Huber, Benjamin Kirsch, Jan C. Aurich (Germany)</i>	Toward safer Human-Robot collaboration in MR environment <i>Natalia Sempere Maciá, Celia Redondo Verdú, Bernard Schmidt, Magnus Holm (Sweden)</i>
15.30 - 15.45	Analysis of the workpiece orientation in a robot's workspace for milling operations <i>Maximilian Bryg, Thomas Bertram, M. Kipfmüller, J. Kotschenreuther (Germany)</i>	Transferability of Bead Geometry Prediction Model in Wire Arc Additive Manufacturing <i>Marwin Gühr, Asif Rashid, Shreyes N. Melkote (USA)</i>	Preliminary comparison between manual assembly and intelligent human-robot collaborative assemblies in terms of quality and assembly time <i>Stefano Puttero, Elisa Verna, Gianfranco Genta, Maurizio Galetto (Italy)</i>
15.45 – 16.00	Investigations on chip breakability in lead-free brass alloy CW511L using different chip breaking geometries <i>Magdalena Susanne Müller, Knut Sørby (Norway)</i>	Selective Laser Melting and Mechanical Characterization of Superalloys Made from Recycled Parts <i>Hugo Tupac-Yupanqui, Amir Armani (USA)</i>	Situation specific tutorial development for the intervention of mobile robots <i>Julia Berger, Hannah-Luisa Ender, Shuang Lu (Germany)</i>
16.00 - 16.15	An assessment of monitoring signal quality acquired from an intelligent tool holder <i>Michal Demko, Marek Vrabel, Peter Ižol, Jozef Brindza, Ildikó Maňková (Slovakia)</i>	Technological simulation of the resulting bead geometry in the WAAM process using a machine learning model <i>B. Denkena, M. Wichmann, V. Böß, T. Malek (Germany)</i>	Method for the selection of an Intuitive Robotic Assistant to support Physically Challenged Employees <i>Albrecht Lottermoser, Gülsen Yücel, Julia Berger (Germany)</i>
16.15 - 16.30	Development of a Friction Model for Cutting Simulations of Lead-Free CuZn-Alloys <i>Kilian Brans, Nicklas Gerhard, Markus Meurer, Thomas Bergs (Germany)</i>	Optimal tool path for extrusion-based additive manufacturing to improve geometrical accuracy and productivity <i>Robert Ehlers, Amir Armani (USA)</i>	User-centered analysis for the implementation of industrial mobile robots <i>Julia Berger, Sonja Schumacher, Julia Mehrer, Shuang Lu (Germany)</i>
16.30 - 16.45	An improved Lagrange-based numerical model for machining Ti-6Al-4V alloy regarding tool cutting edge microgeometry <i>Cheng Hu, Kejia Zhuang, José Outeiro (France)</i>	Ballistic impact analysis on an auxetic panel realized by additive manufacturing <i>Carlo Giovanni Ferro, Paolo Maggiore, Stella Maria Gemma Marraccini, Alessandro Marchino (Italy)</i>	Control concept for coupled robots and stiffness analysis <i>Thomas Bertram, Maximilian Bryg, Martin Kipfmüller, Jan Kotschenreuther (Germany)</i>
20.00	Official Dinner at 20.00, Hotel Continental Ischia		

DAY 3		Friday, July 14 - Morning Sessions: 9.00 – 13.00		
	SESSION A6 Chairman: I. Shyha	SESSION B6 Chairman: P. Aguiar	SESSION C6 Chairman: G. Dini	
	Cutting Technologies V & Non Traditional Machining	Additive Manufacturing IV	Battery Production	
09.00 - 09.15	A Framework for Tool Condition Monitoring of Abrasive Waterjet Systems <i>Danila Pietrow, J. Patrick A. Fairclough, Kevin Kerrigan (UK)</i>	Surface quality prediction for FDM-printed parts using in-process material flow data <i>Jan Mayer, Tra Bui Thi Thanh, Turgut Caglar, Hendrik Schulz, Omar Ben Lallahom, Dongxu Li, Max Niemella, Burak Toptas, Roland Jochem (Germany)</i>	Developing a concept for the implementation of predictive quality in battery production <i>A. Kampker, H. Heimes, Paul Lingohr, J. Schmied, H. Clever, B. Dorn (Germany)</i>	
09.15 - 09.30	A Study on Particulates Release when Machining Nano-structured Polymeric Composites <i>Islam Shyha, Michael Deary, Dehong Huo (UK)</i>	A Study on Acoustic Signals from an Electret Microphone in 3D Printing <i>Paulo Aguiar, Thiago Glissoi, Doriana Daddona, Reinaldo Gotz, Thiago Valle (Brasil)</i>	High-frequency eddy current measurement for the characterisation of graphite anode slurries in battery cell production <i>Henning Clever, D. Schmidt, M. Klein, B. Dorn, H. Heimes, A. Kampker (Germany)</i>	
09.30 – 09.45	In-process tool incidence identification based on temporal pyramid pooling and convolutional neural network <i>Jiduo Zhang, Robert Heinemann, Otto Jan Bakker, Menghui Zhu (UK)</i>	Selection and evaluation of a MES software for a 3D printing center at point of care <i>Philipp Url, Daniel Sudy, Wolfgang Vorraber (Austria)</i>	Data Mining for Early Cycle Life Prediction in Lithium-Ion Battery Production <i>Sandro Stock, Mahmoud Ahmed, Fabian Konwitschny, Ruediger Daub (Germany)</i>	
09.45 - 10.00	Numerical and Experimental Investigation of the Thermomechanical Loads on the machined Surface when Cutting Inconel DA718 <i>Pascal Behrens genannt Wäcken, Nicklas Gerhard, Markus Meurer, Thomas Bergs (Germany)</i>	Multi-material additive manufacturing through electrostatic metal powder attraction and laser-induced forward transfer <i>Vegard Brøtan, Olav Åsebø Berg, Eivind Johannes Øvrelid, Alexander Rudenkov, Maksim Demesh, Thomas Léon Sebastian Reinery, Irina Sorokina (Norway)</i>	Holistic modeling of the electrolyte filling process to study the dosing and wetting behavior of lithium-ion batteries <i>Jan Hagemeister, Ahmed Elkhoshea, Yiping Hu, Ruediger Daub (Germany)</i>	
10.00 - 10.15	Evaluation of process stability in precise electrochemical machining using machine learning models based on extracted features <i>E. Tchoupe, L. Heidemanns, U. Küpper, A. Klink, T. Herrig, T. Bergs (Germany)</i>	In-situ acoustic signals correlation of process parameters in laser powder bed fusion <i>Levent Subasi, Soner Oren, Gokhan Dursun, Cagdas Sen, Akin Orhangul (Turkey)</i>	Diagnosis and remaining useful life prediction of end-of-life battery systems for second-life applications <i>Johannes Wanner, S. Singh, T. Nagel, A. Patel, S. Baazouzi, J. Grimm, K. Birke (Germany)</i>	
10.15 - 10.30	Surface Roughness Prediction in Hardturning (Finishing) of 16MnCr5 Using a Model Ensemble Approach <i>Jannis Jacob, Markus Meurer, Thomas Bergs (Germany)</i>	Effect of preheat in DED-LB/wire of Ni-base, Cu-base and Fe-base alloys <i>Trond Arne Hassel, Knut Sørby, Vegard Brøtan (Norway)</i>	Leveraging Industry 4.0 Solutions for Lithium-Ion Battery Manufacturing: A Gap Analysis of OPC UA Companion Specifications <i>A. Kampker, H. H. Heimes, B. Dorn, H. Clever, R. Ludwigs, Rui Yan Li (Germany)</i>	
10.30 - 10.45	Developing a Modeling-Approach to represent Flexibility in Process Engineering for the Implementation of a Dynamic Scheduling for the Production of green PtX-Products <i>Nikola Mößner, Pascal Häbig, Kai Hufendiek (Germany)</i>	Simulation of micro-CT acquired geometry of additively manufactured open porosities. <i>Robert Otto, Uliana Soellner, Christoph Kiener, Stefan Boschert, Roland Wuechner, Knut Sørby (Germany)</i>	Evaluation of Logistic Concepts for Flexible and Automated Electrode Production <i>Anja Munzke, C. Härdtlein, B. Stumper, C. Berger, Rüdiger Daub (Germany)</i>	
10.45 - 11.15	Coffee Break			

DAY 3		SESSION A7 Chairman: E. Francalanza	SESSION B7 Chairman: A. Simeone	SESSION C7 Chairman: G. Genta
	Production Systems II & Cyber Physical Systems I	Sustainability in Manufacturing	Grinding & Gear Manufacturing	
11.15 - 11.30	Uncovering the behaviour of facility layout problem solutions in relation to factory design applications <i>Peter Burggräf, Tobias Adlon, Nils Lehde, Niklas Lindholm (Germany)</i>	A process-level LCA for evaluating the contribution of digitalization in the greening of a manufacturing system <i>Alexios Chaloulos, Paolo Catti, Nikolaos Nikolakis, Kosmas Alexopoulos (Greece)</i>	Intelligent dressing for continuous generating grinding with convolutional neural networks & knowledge distillation <i>Martin Boesler, Marco Schumann, Phyllipp Klimant, Martin Dix (Germany)</i>	
11.30 - 11.45	The influence of distance metrics on the facility layout problem <i>Marcel Öfele, David Rottenegger, Stefan Braunreuther (Germany)</i>	A Modular System Architecture for an Offshore Off-grid Platform for Climate neutral Power-to-X Production in H2Mare <i>Pascal Häbig, D. Dittler, M. Fey, T. Müller, N. Mößner, N. Jazdi, M. Weyrich, K. Hufendiek (Germany)</i>	Modeling of the process force induced deformation of elastically bonded honing rings <i>Maximilian Schrank, Mareike Solf, Thomas Bergs (Germany)</i>	
11.45 - 12.00	Evaluation of Clustering Approaches and Proximity Measures for Product Family Identification <i>Christian Urnauer, Leon Rudolph, Joachim Metternich (Germany)</i>	Impact of operator health and safety on manufacturing process risk management <i>G. Sansone, M. Anselmi, Alessandro Simeone, P.C. Priarone, L. Settineri (Italy)</i>	Process and tool design optimization for hypoid gears with help of manufacturing simulation BevelCut. <i>Melina Kamratowski, J. Mazak, J. Brimmers, T. Bergs (Germany)</i>	

12.00 – 12.15	A digital twin for SMEs in the context of Industry 5.0 <i>Matteo De Marchi, Amberlynn Bonello, Emmanuel Francalanza, Erwin Rauch (Malta)</i>	Development of stationary expert systems for improving energy efficiency in manufacturing <i>Borys Ioshchikhes, Matthias Weigold (Germany)</i>	Workpiece Quality Prediction for Gear Hobbing based on Sensor Data <i>Steffen Hendricks, Mareike Solf, Thomas Bergs (Germany)</i>
12.15 - 12.30	Towards Digital-Twin-Driven Factory Planning – A Systematic Review <i>Peter Burggräf, Tobias Adlon, Niklas Schäfer (Germany)</i>	How grey wolf optimization effects remanufacturing <i>Barna Gal, Christine Zeh, Ádám Szaller (Austria)</i>	Investigation of the manufacturability of topological modifications using adapted kinematics for gear skiving <i>Christopher Janssen, Stylianos Tsakiris, Mareike Solf, Thomas Bergs (Germany)</i>
12.30 – 12.45	Paving the way for automated factory planning – applying rule-based expert systems to capacity planning <i>Peter Burggräf, Tobias Adlon, Niklas Schäfer (Germany)</i>	Automated data-driven dimensioning and planning of modular large-scale electrolysis plants <i>Daniel Syniawa, Malte Jakschik, Alfred Hypka, Bernd Kuhlenkötter (Germany)</i>	Experimental validation of the plane-based penetration calculation for the gear skiving of internal gears <i>Charalampos Alexopoulos, Christopher Janßen, Mareike Solf, Thomas Bergs (Germany)</i>
12.45 – 13.00	A Digital Twin Platform for service-based Testing and Optimization <i>Shengjian Chen, Michael Neubauer, Alexander Verl (Germany)</i>	Automated pipe routing in context of large-scale electrolyzer plants <i>Malte Jakschik, Daniel Syniawa, Alfred Hypki, Bernd Kuhlenkötter (Germany)</i>	On the profile change of conical skiving tools after re-sharpening <i>Enea Olivoni, Rocco Vertechy, Vincenzo Parenti-Castelli (Italy)</i>
13.15 - 15.00	Lunch		

DAY 3		Friday, July 14 - Afternoon Sessions: 15.00 – 16.45	
	SESSION A8 Chairman: P. Refalo	SESSION B8 Chairman: G. Putnik	SESSION C8 Chairman: A. Marzano
	Cyber Physical Systems II	“BioMeld” Special Session & Biologicalisation in Industry	Quality, Metrology & Testing II
15.00 - 15.15	Industrial Small Data: Definition and Techniques for Data Augmentation in Manufacturing <i>Benny Drescher, Christoph Rippe (Germany)</i>	Bio-intelligent manufacturing cell (BIMC) development for biohybrid machines (BHM) fabrication within the EC Horizon Europe BioMeld project <i>Roberto Teti, Alessandra Caggiano (Italy)</i>	Mobile Web App for the Digitization and Annotation of Manual Visual Inspection Tasks <i>Julian Koch, Denis Jevremovic, Thorsten Schüppstuhl (Germany)</i>
15.15 - 15.30	Methods for evaluating and improving manual process data acquisition in one-of-a-kind productions <i>David Jericho, Konrad Jagusch, Jan Sender, Wilko Flügge (Germany)</i>	Identifying intelligent data utilization in bioprocesses: overview of current research activities, opportunities and barriers <i>Arber Shoshi, Betül Gündüz, Robert Mieke (Germany)</i>	Performances of an in-line deep learning-based inspection system for surface defects of die-cast components for hybrid vehicles <i>Giorgio Cavaliere, Yuri Borgianni, Enrico Savio (Italy)</i>
15.30 - 15.45	The development of a generic IIOT framework for an industrial pneumatic system <i>Jasmine Mallia, Emmanuel Francalanza, Peter Xuereb, Paul Refalo (Malta)</i>	Biology-Technology Interfaces - Refining the Core Principle of Biointelligent Systems <i>Yannick Baumgarten, Arber Shoshi, A. Gaisler, M.P. Langner, J. Full, Thomas Bauernhansl, Robert Mieke (Germany)</i>	A Framework for Anomaly Classification and Segmentation in Remanufacturing using Autoencoders and Simulated Data <i>Jan-Philipp Kaiser, Carl-Leandro Enslin, Erik Tabuchi Barczak, Florian Stamer, M. Heizmann, Gisela Lanza (Germany)</i>
15.45 - 16.00	Fault Condition Indicators along the Demand Side of a Sustainable Compressed Air System <i>Massimo Borg, Paul Refalo, Emmanuel Francalanza (Malta)</i>	Assessment of novel biorefinery concepts for the production of biohydrogen and value-added products from industrial waste streams <i>Edgar Gamero, J. Full, Robert Mieke, Thomas Bauernhansl, A. Sauer (Germany)</i>	Durability and Reliability of Sensors in Smart Steel IBCs: Results from the smart CONSERVE Project <i>P. Burggräf, T. Adlon, F. Steinberg, Jan Salzwedel, P. Nettesheim, H. Tschauder (Germany)</i>
16.00 - 16.15	Enabling applications for variable vehicle configurations with Software-defined Vehicle and Service-oriented Architecture <i>Dirk Slama, Jens Lachenmaier (Germany)</i>	Transfer of synthesis, logistics, and recycling processes in nature to industrial processes <i>Oliver Christoph Schwarz, Edgar Antonio Gamero Fajardo (Germany)</i>	A statistical approach for characterizing the compressive stress of foams via computed tomography <i>Keanu Zenz, Clemens Sulz, Günther Poszvek, Friedrich Bleicher (Austria)</i>
16.15 - 16.30	Cyber-Physical Optimization of Production Processes Using Cascade AIs: A Robot-Guided MAG Welding Use-Case <i>Peter Burggräf, Fabian Steinberg, Philipp Nettesheim, Gerald Kolter (Germany)</i>	Decision Support Based on Digital Twin Simulation: A case study in Distillery Industry <i>Adelaide Marzano, Alessandra Caggiano (UK)</i>	Applicability of control systems for predicting adjustments of body shop fixtures <i>Julian Schuetzenberger, Claus-Dieter Reiniger, Martin Manns (Germany)</i>
16.30 - 16.45	Production Activity Control Framework for Make-To-Order Industry Utilizing Cyber-Physical Production System <i>Anas Ma'ruf, Doli Tri Dito (Indonesia)</i>	Implementing Virtuality in Social Network based Education <i>Goran Putnik, Catia Alves, Leonilde Varela, Luis Ferreira (Portugal)</i>	Application of OCR-based assistance solutions in engine maintenance <i>Sophie Sandner, Phillip Bausch, Nikolai Strek, Joachim Metternich (Germany)</i>
16.45 – 17.00	CONFERENCE CLOSURE AND FAREWELL R. Teti, CIRP ICME '23 Conference Chairman		

SESSION OF VIDEO PRESENTATION PAPERS

Adaptive Design of Experiments guided by an active learning approach
Christoph Kellermann, Joern Ostermann (Germany)

Advanced procedures and scheduling for aircraft assembly processes: A systematic review approach.
David Blanco, Eva M. Rubio, Beatriz Agustina, Marta M. Marín, Ana M. Camacho (Spain)

Association Rule Mining for Dynamic Error Classification in the Automotive Manufacturing Industry
Andreas Schoch, Robert Refflinghaus, Nina Schmitzberger, Alexander Wolters (Germany)

Anomaly Detection of Wire Arc Additively Manufactured Parts via Surface Tension Transfer through Unsupervised Machine Learning Techniques
Giulio Matterna, J. Polden, Alessandra Caggiano, P. Commins, Luigi Nele, Z. Pan (Italy)

Study on influence of ink material properties on deposited filaments in direct ink writing based on numerical simulations
Yongqiang Tu, Alaa Hassan, Ali Siadat, Gongliu Yang (PR China)

Surface characteristic of Ti-6Al-4V alloy fabricated by Electron Beam Melting prepared by different surface post treatments
Amir Behjat, Mohammad Hossein Mosallanejad, Morteza Shamanian, Aboozar Taherizadeh, Luca Iuliano, Abdollah Saboori (Italy)

Streamlining LEGO® model design: an automated optimization approach
Nengsheng Bao, Yongyi Zhang, Yuchen Fan, Alessandro Simeone (PR China)

Health 4.0 architecture proposal for planning and management of a hospital emergency department
Lucas Caldas Danelon Lopes, Clóvis Neumann, Michael Machado (Brazil)

Intelligent robot assistants for the integration of neurodiverse operators in manufacturing industry
Yuchen Fan, Dario Antonelli, Alessandro Simeone, Nengsheng Bao (Italy)

Leveraging data to enhance rule-based order consolidation in logistics operations
Klaudia Zeleny, Júlia Bergmann, Dávid Gyulai, Maik Frye, Robert H. Schmitt (Hungary)