

10th CIRP Global Web Conference (CIRPe 2022)

Materials Aspects of Manufacturing Processes

Procedia CIRP Volume 115

Online
25 – 27 October 2022

Editors:

**Amir Malakizadi
Peter Krajnik
Danfang Chen**

ISBN: 978-1-7138-6291-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2022) The Authors. Published by Elsevier Ltd.
Creative Commons Attribution 4.0 International License.
License details: <http://creativecommons.org/licenses/by/4.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination, and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2023)

For permission requests, please contact the publisher:

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Design and Use of the Digital Representation of a CT Measurement Process to Study the Effect of Influence Factors on Dimensional Quantities.....	1
<i>Christian R. Baldo, Wim Dewulf</i>	
CAM Planning for Automatic Support Removal with Robotic Chiseling.....	7
<i>Denys Plakhotnik, Robin Tomcin, Tobias Hauser, Tobias Kamps, Marc Stautner</i>	
Investigation of the Direct Energy Deposition Process of CuSn10 on Ceramic Insulating Layers	13
<i>Kim Torben Werkle, Simon Fink, Hans-Christian Möhring</i>	
Exploring the Applicability of Sinterjoining to Combine Additively Manufactured Ceramic Components.....	18
<i>Johannes Schubert, Yannik End, Volker Schulze, Frederik Zanger</i>	
Experimental Investigations of the Workpiece-Media-Interaction and the Surface Topography Formation in Centrifugal Disc Finishing.....	24
<i>Marco Kopp, Eckart Uhlmann, Christian Kneider</i>	
Identification of Material Properties for Finite Element Simulation of the Deep Rolling Process Applied to Welded Joints.....	30
<i>Steffen Heikebrügge, Bernd Breidenstein, Benjamin Bergmann, Christian Dänekas, Jan Schubnell</i>	
Simulation of the Temperature Gradient in Laser-Based Powder Bed Fusion Using Machine Learning	36
<i>Li Yi, Peter M. Simon, Shradha Ghansiyal, Moritz Glatt, Jan C. Aurich</i>	
Influence of Core Hole Diameter on Thread Quality for a High-Performance Tapping Technology in AlSi10MnMg Cast Alloys	42
<i>Nils Felinks, Erik Krumme, Christian Beer, Dietmar Hechtle, Dirk Biermann</i>	
Minimization of Defects Generation in Laser Welding Process of Steel Alloy for Automotive Application.....	48
<i>Giacomo Maculotti, Gianfranco Genta, Elisa Verna, Stefano Bonù, Maurizio Galetto</i>	
Deglobalization of Manufacturing Value Chains? a Data-Based Approach	54
<i>Stefan Seifermann, Jossip Anzeneder</i>	
Current Role of the Digital Transformation for Improved Materials and Material Utilization	60
<i>Nicole Stricker, Sophia Egetenmayer, Franziska Gerstmeier, Caroline Strack, Fabian Streinz</i>	
Force Modeling in Generating Gear Grinding Considering the Grinding Worm Topography	66
<i>Patricia De Oliveira Löhner, Mareike Solf, Jens Brimmers, Thomas Bergs</i>	
Comparison of Machining Performance of Stainless Steel 316L Produced by Selective Laser Melting and Electron Beam Melting	72
<i>S. B. Hosseini, D. Mallipeddi, J. Holmberg, L.-E. Rännar, U. Klement</i>	
Investigation of Material Strength and Oil Compressibility on the Hydrostatic Pressure Build-Up in Metal Forming Lubricants.....	78
<i>Maximilian Zwicker, Jon Spangenberg, Paulo Martins, Chris V. Nielsen</i>	

Designing Resilient Manufacturing Systems Using Cross Domain Application of Machine Learning Resilience	83
<i>Avik Mukherjee, Moritz Glatt, Waleed Mustafa, Marius Kloft, Jan C. Aurich</i>	
Avoiding Process Vibrations by Suppressing Chip Segmentation During Machining of Aerospace Alloy Ti6Al4V.....	89
<i>Sebastian Berger, Gabriel Brock, Jannis Saelzer, Dirk Biermann</i>	
FEM-Based Simulation of Continuous Wear of CrAlN-Coated Tools	95
<i>Bernd Breidenstein, Benjamin Bergmann, Sascha Beblein, Florian Grzeschik</i>	
Model-Based Prediction of the Detachment of Microspheres from Dry-Adhesive Gripper Surfaces by Bending	101
<i>Finn Meiners, Cirk Tuitje, Sebastian Hogreve, Kirsten Tracht</i>	
Optical Sensor-Based Process Monitoring in Additive Manufacturing.....	107
<i>Li Yi, Alborz Shokrani, Rachele Bertolini, Unai Mutilba, Peer Woizeschke</i>	
Empirical Studies on the Influence of Tool and Process Parameters on the Machinability in Plunge Milling of Lead-Free CuZn-Alloys	113
<i>Kilian Brans, Stefan Baier, Daniel Schraknepper, Thomas Bergs</i>	
Process Monitoring of a Vibration Dampening CFRP Drill Tube in BTA Deep Hole Drilling Using Fibre-Bragg-Grating Sensors.....	119
<i>Jannik Summa, Sebastian Michel, Moritz Kurkowski, Dirk Biermann, Hans-Georg Herrmann</i>	
Impact of Powder Recoating Speed on Built Properties in PBF-LB Process.....	125
<i>Laura Cordova, Zhuoer Chen</i>	
A Reference Architecture for the Operationalization of Machine Learning Models in Manufacturing	130
<i>Tim Raffin, Tobias Reichenstein, Jonas Werner, Alexander Kühl, Jörg Franke</i>	
Qualitative Assessment of the Impact of Manufacturing-Specific Influences on Machine Learning Operations	136
<i>Tim Raffin, Tobias Reichenstein, Dennis Klier, Alexander Kühl, Jörg Franke</i>	
Investigation of the Surface Integrity of Mechano-Chemically Finished Powder Metallurgy Gears.....	142
<i>Dinesh Mallipeddi, Elias Forssbeck Nyrot, Martin Hansén, Tommy Brandt, Peter Krajnik</i>	
A Study of Machinability of Al7075-T6 with Solid Carbide End Mills.....	148
<i>Gaetano M. Pittalà, Stefano Linguanotto</i>	
Effect of Cutting Parameters on the Generated Surface Integrity of Hard-Turned Martensitic AISI 52100 Bearing Steel	154
<i>Sahith Kokkiralala, Jonas Holmberg, Uta Klement, Roger Lundstrom, Seyed B. Hosseini</i>	
Speed of Innovation Diffusion of Water Electrolysis Technologies	160
<i>Dhakshin Kumar, Oliver Schwabe, Lourenco Horta Correia, Nuno Marques De Almeida</i>	
Deep Object Detection Framework for Automated Quality Inspection in Assembly Operations.....	166
<i>Fotios Panagiotis Basamakis, Angelos Christos Bavelos, Dimosthenis Dimosthenopoulos, Apostolis Papavasileiou, Sotiris Makris</i>	
Tracking and Tracing in Manufacturing Supply Chains Using Blockchain Technology.....	172
<i>Stefan Seifermann, Indah Hapsara Murti, Janis Oberle</i>	

Design for 3D Printing of a Robotic Arm Tool Changer Under the Framework of Industry 5.0.....	178
<i>Dimitris Mourtzis, John Angelopoulos, Michalis Papadokostakis, Nikos Panopoulos</i>	
Applying Natural Language Processing in Manufacturing	184
<i>Marvin Carl May, Jan Neidhöfer, Tom Körner, Louis Schäfer, Gisela Lanza</i>	
Shopfloor Management Acceptance in Global Manufacturing	190
<i>Magnus Kandler, Lukas Dierolf, Matthias Bender, Louis Schäfer, Gisela Lanza</i>	
A Multi-View Deep Learning Approach for Quality Assessment in Laser Welding of Hairpin Windings Based on 2D Image Captures	196
<i>Andreas Mayr, Johannes Bauer, Jörg Franke</i>	
Surface Integrity Characterization by Barkhausen Noise Measurement After Milling Processes with End Mills	202
<i>Christoph Zachert, Daniel Schraknepper, Thomas Bergs</i>	
An ML-Based Approach for Inverse Identification of Heat Flux in Machining.....	208
<i>Ahmet Semih Erturk, Amir Malakizadi, Ragnar Larsson</i>	
A Human Robot Collaborative Cell for Automating NDT Inspection Processes	214
<i>Katerina Bakopoulou, George Michalos, Konstantinos Mparis, Christos Gkournelos, Sotiris Makris</i>	
Towards an Intelligent Straightening System for Flat Enameled Copper Wire: Problem Statement, Review of Related Work, and Basic Concept.....	220
<i>Andreas Mayr, Marcel Baader, Tim Raffin, Andreas Riedel, Jörg Franke</i>	
Modelling for Control of Vacuum Grippers in Automatically Reconfigurable Fixturing Systems for Thin-Walled Workpieces	226
<i>Andreas Schütz, Armin Lechler, Alexander Verl</i>	
Recent Advances in Modelling and Simulation of Surface Integrity in Machining – a Review	232
<i>Amir Malakizadi, Rachele Bertolini, Francois Ducobu, Z. Murat Kilic, Alborz Shokrani</i>	

Author Index