

4th CIRP Conference on BioManufacturing (CIRP-BioM 2019)

Procedia CIRP Volume 89

Guangzhou, China
12 – 15 December 2019

Editors:

Chengyong Wang
Sandy To

Mo Yang
Xin Zhao

ISBN: 978-1-7138-1460-3

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© by Elsevier B.V.
All rights reserved.

Printed with permission by Curran Associates, Inc. (2020)

For permission requests, please contact Elsevier B.V.
at the address below.

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

<p>PREFACE 24</p> <p style="padding-left: 20px;"><i>Sandy To, Chengyong Wang</i></p> <p>PROGRESS IN METAL-ASSISTED CHEMICAL ETCHING OF SILICON NANOSTRUCTURES 26</p> <p style="padding-left: 20px;"><i>Xidu Leng, Chengyong Wang, Zhishan Yuan</i></p> <p>LASER MICRO-WELDING OF AZ92A MAGNESIUM WIRES USING A FIBER-LASER: A PRELIMINARY STUDY 33</p> <p style="padding-left: 20px;"><i>Luis D. Cedeño-Viveros, Juansethi Ibarra-Medina, Ciro A. Rodríguez, Elisa Vázquez, Erika García-López</i></p> <p>CARBONIZATION OF POLYMER PRECURSORS SUBSTRATES TO DIRECT HUMAN IPSC-DERIVED NEURONS DIFFERENTIATION AND MATURATION 39</p> <p style="padding-left: 20px;"><i>R. M. Ferraro, P. S. Ginestra, S. Giliani, E. Ceretti</i></p> <p>A PROCESS TOWARDS ELIMINATING CYTOTOXICITY BY REMOVAL OF SURFACE CONTAMINATION FROM ELECTRICAL DISCHARGE MACHINED NITINOL 45</p> <p style="padding-left: 20px;"><i>Robert Roth, Suat Coemert, Sarah Burkhardt, Katia Silke Rodewald, Tim C. Lueth</i></p> <p>CONCEPT AND REALIZATION OF A HANDHELD MANIPULATOR SYSTEM FOR TRANSNASAL MIDDLE EAR SURGERY 52</p> <p style="padding-left: 20px;"><i>Suat Coemert, Valentin Ameres, Robert Roth, Gero Strauss, Tim C. Lueth</i></p> <p>USE OF CENTRAL COMPOSITE DESIGN AND ARTIFICIAL NEURAL NETWORK FOR PREDICTING THE YIELD OF BIODIESEL 59</p> <p style="padding-left: 20px;"><i>Ilesanmi Daniyan, Emmanuel Bello, Tunde Ogedengbe, Khumbulani Mpopu</i></p> <p>SIMULATION OF HIP IMPLANT WITH RESPECT TO THE CLEARANCE BETWEEN THE BONE AND ENDOPROSTHESIS: A CASE STUDY 68</p> <p style="padding-left: 20px;"><i>Shahzad Ahmad, Yaxiong Liu, Lele Dong, Huilong Liu, Qiang Zuo</i></p> <p>SELF-SUPPORTED NASOPHARYNGEAL AIRWAY DEVICE FOR TREATMENT OF HYPOTONIC UPPER AIRWAY OBSTRUCTION 74</p> <p style="padding-left: 20px;"><i>Zahra Nourmohammadi, Annie D. R. Li, Jeff S. Plott, Allison R. Powell, David A. Zopf</i></p> <p>EXPERIMENTAL INVESTIGATION OF BIOLOGICAL AND MECHANICAL PROPERTIES OF COCRM O BASED SELECTIVE LASER MELTED METAMATERIALS FOR BONE IMPLANT MANUFACTURING 79</p> <p style="padding-left: 20px;"><i>Saiful Anwar Che Ghani, Siti Rohaida Mohamed, Munirah Sha'Ban, Wan Sharuzi Wan Harun, Nor Aida Zuraimi Md Noar</i></p> <p>REAL BIFURCATED VASCULAR GRAFTS MANUFACTURING FOR TISSUE ENGINEERING 92</p> <p style="padding-left: 20px;"><i>Antonio J. Guerra, Caterina De Marie, Elisabetta Ceretti, Joaquim Ciurana</i></p> <p>MANUFACTURE OF PCL SCAFFOLDS THROUGH ELECTROSPINNING TECHNOLOGY TO ACCOMMODATE TRIPLE NEGATIVE BREAST CANCER CELLS CULTURE 98</p> <p style="padding-left: 20px;"><i>Marc Rabionet, Teresa Puig, Joaquim Ciurana</i></p> <p>BIOPRINTING PROCESS OPTIMIZATION: EVALUATION OF PARAMETERS INFLUENCE ON THE EXTRUSION OF INORGANIC POLYMERS 104</p> <p style="padding-left: 20px;"><i>P. S. Ginestra, R. Rovetta, A. Fiorentino, E. Ceretti</i></p>	<p>24</p> <p>26</p> <p>33</p> <p>39</p> <p>45</p> <p>52</p> <p>59</p> <p>68</p> <p>74</p> <p>79</p> <p>92</p> <p>98</p> <p>104</p>
---	--

ELECTROSPINNING OF POLY(VINYL ALCOHOL)-GRAPHENE OXIDE ALIGNED FIBERS	110
<i>P. Ginestra, L. Riva, A. Fiorentino, D. Zappa, E. Ceretti</i>	
EFFECT OF CUTTING PARAMETERS ON CUTTING FORCE AND SURFACE QUALITY IN CUTTING OF ARTICULAR CARTILAGE	116
<i>Xiaolin Pang, Yue Zhang, Chengyong Wang, Zhihua Chen, Bin Chen</i>	
RESEARCH ON PREPARATION AND PROCESSING PROPERTIES OF MEDICAL MAGNESIUM ALLOY	122
<i>Yanan Wang, Guodong Liu, Yuwei Song, Yang Qiao</i>	
EFFECTS OF TOPOLOGICAL STRUCTURE ON ANTIBACTERIAL BEHAVIOR AND BIOCOMPATIBILITY OF IMPLANT	126
<i>Ziying Guo, Chengyong Wang, Cezhi Du, Jianbo Sui, Jianye Liu</i>	
PARAMETERS OPTIMIZATION FOR VIBRATION ASSISTED BIOPSY INSERTION	132
<i>Zihao Liu, Chenxu Cai, Lei Tan, Qinhe Zhang, Hongcai Zhang</i>	
CURRENT BLOCKAGE OF PSA MOLECULAR IN SI ₃ N ₄ /SI/SI ₃ N ₄ SANDWICH NANOPORE	138
<i>Zhipeng Xie, Chengyong Wang, Zhishan Yuan</i>	
DESIGN OF SOFT SMART SHOES FOR JOINT ANGLE ESTIMATION IN HUMAN GAIT	143
<i>Jiantao Yang, Xianghan Lin, Yuehong Yin</i>	
EFFECTS OF CLAMPING FORCE ON CARRYING ENERGY ABILITY OF A HARMONIC SCALPEL.....	148
<i>Xinggong Jiang, Peiyuan Jiang, Shangda Li, Daxi Geng, James K. Mills</i>	
DESIGN OF A BIOHYBRID ROBOT BY MIMICKING THE GAIT MECHANISM OF APLYSIA CALIFORNICA	154
<i>M. Usman Akhtar, Lin Gao, Haoyue Wen, Qianhui Gao, Dichen Li</i>	
A NOVEL BACTERIAL BIOFILMS ERADICATION STRATEGY BASED ON THE MICRONEEDLES WITH ANTIBACTERIAL PROPERTIES.....	159
<i>Xin Yi, Chengyong Wang, Xiao Yu, Zhishan Yuan</i>	
GALVANIC CORROSION OF POWDER SINTERED COMPONENT AND IMPROVEMENT OF MATERIAL REMOVAL RATE FOR BIOMACHINING.....	164
<i>Fei Ma, Hui Huang</i>	
DESIGN AND CHARACTERIZATION OF HYDROXYAPATITE SCAFFOLDS FABRICATED BY STEREOLITHOGRAPHY FOR BONE TISSUE ENGINEERING APPLICATION	170
<i>Zhen Wang, Chuanzhen Huang, Jun Wang, Bin Zou, Xiaodan Wang</i>	
POSITIONING ASSESSMENT OF SURGICAL CUTTING GUIDES FOR OSTEOSARCOMA RESECTION UTILIZING 3D SCANNING TECHNOLOGY.....	176
<i>Emilio A. Ramírez, Paulina Arnés Urgellés, Galo A. Durazno, Fausto A. Maldonado, Carlos G. Helguero</i>	
A NEW HIGH-BANDWIDTH NANOPositionING TRACKING CONTROL METHOD WITH INPUT SHAPER AND INTEGRAL RESONANCE CONTROLLER	182
<i>Zijie Hong, Hui Tang, Ying Xu, Zelong Wu, Jiedong Li</i>	
CUTTING FORCE ANALYSIS OF BOVINE ACETABULAR CARTILAGE.....	189
<i>Pengwei Chen, Jianbo Sui, Chengyong Wang</i>	

A VALIDATED FINITE ELEMENT MODEL OF INTERTROCHANTERIC FRACTURES WITH INHOMOGENEOUS MATERIAL PROPERTIES EXTRACTED FROM CT IMAGES.....	194
<i>Zongchao Liu, Junwei Yang, Gongfa Chen, Fangsen Cui</i>	
EFFECT OF FEED CONDITION ON THRUST FORCE AND TORQUE DURING CONTINUOUS AND STEP-BY-STEP DRILLING OF CORTICAL BONE	201
<i>Airong Zhang, Cuirong Bian, Xinzhi Zhang, Jing Zhang, Song Zhang</i>	
AN IN VITRO STUDY OF THERMAL CONDUCTIVITY AND THERMAL DIFFUSIVITY IN A BIPOLAR VESSEL SEALING MODALITY	207
<i>Liu Huan, Li Liqing, Chen Wenqiang</i>	
INFLUENCE OF BIOCOMPATIBLE HYDROPHILIC COATED NEEDLE ON PUNCTURE PROCESS THROUGH A SIMULATION METHOD.....	214
<i>Fan Gao, Qinghua Song, Yonghang Jiang, Zhanqiang Liu, Xiuqing Hao</i>	
PREPARATION AND BIOACTIVE RESPONSE OF SUPER-HYDROPHILIC SURFACE ON SELECTIVE LASER MELTING TITANIUM.....	222
<i>Xiao Zhang, Yi Wan, Zhanqiang Liu, Hongwei Wang, Dong Zhang</i>	
STUDY ON THE LOW-POWER TISSUE CUTTING OF ELECTROSURGERY ASSISTED WITH HEAT	228
<i>Wenshuai Wu, Guang Yao, Deyuan Zhang, Xiangyu Zhang</i>	
MULTIPLE REGRESSION PREDICTION MODEL FOR CUTTING FORCES AND SURFACE ROUGHNESS IN MICRO-MILLING OF TA2	233
<i>Zhihua Chen, Chengyong Wang, Yue Zhang</i>	
THREE-DIMENSIONAL RECONSTRUCTION OF JAW AND DENTITION CBCT IMAGES BASED ON IMPROVED MARCHING CUBES ALGORITHM	239
<i>Jingyi Wang, Zhi Huang, Xing Yang, Weibo Jia, Tao Zhou</i>	
ULTRASONIC-ASSISTED TRANSDUCER FOR ELECTROSURGICAL ELECTRODES.....	245
<i>Zhenlong Peng, Deyuan Zhang, Xiangyu Zhang, Guang Yao</i>	
DEVELOPMENT AND APPLICATION OF PHYSICAL VAPOR DEPOSITED COATINGS FOR MEDICAL DEVICES: A REVIEW	250
<i>Lan Geyao, Deng Yang, Chen Wanglin, Wang Chengyong</i>	
PREDICTION MODEL OF BONE DRILLING TEMPERATURE BASED ON HEAT SOURCE METHOD IN SURGICAL REHABILITATION.....	263
<i>Yahui Hu, Zhiqiang Yan, Xiangjun Li, Chunqiu Zhang, Qingchun Zheng</i>	
NEEDLE DEFORMATION IN THE PROCESS OF PUNCTURE SURGERY: EXPERIMENT AND SIMULATION.....	270
<i>Yonghang Jiang, Qinghua Song, Fan Gao, Zhanqiang Liu, Xiuqing Hao</i>	
EXPERIMENTAL STUDY ON LASER ASSISTED BELT GRINDING OF SHARK-SKIN BIO-INSPIRED RIBBLETS UNDER DIFFERENT SURFACE ROUGHNESS	277
<i>Yun Huang, Yuan Wu, Yi He, Quanzhong Zhao, Kangkang Song</i>	
PREPARATION AND APPLICATION OF A NOVEL WATER-BASED VISCOELASTIC POLISHING FLUID FOR ABRASIVE FLOW MACHINING	282
<i>Zhenzhong Zhang, Xianpeng Zhang, Xiao Liu, Peifa Zhou, Bin Zou</i>	

Author Index