## 2017 8th International Conference on Mechanical and Intelligent Manufacturing Technologies (ICMIMT 2017)

Cape Town, South Africa 3 – 6 February 2017



**IEEE Catalog Number: ISBN:** 

: CFP17K55-POD 978-1-5386-0378-9

## Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP17K55-POD

 ISBN (Print-On-Demand):
 978-1-5386-0378-9

 ISBN (Online):
 978-1-5386-0377-2

#### 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

E-mail: curran@proceedings.com Web: www.proceedings.com



### **Table of Contents**

# 2017 8th International Conference on Mechanical and Intelligent Manufacturing Technologies (ICMIMT)

Message from the General Chairsvii  Conference Committeesviii	
Session 1: Material Property Analysis and Proces	ssing
Effect of Scanning Speed on Laser Deposited 17-4PH Stainless Steel	1
Abiodun Bayode, Sisa Pityana, Esther Titilayo Akinlabi, Mxolisi Brendon Shong	gwe
Effect of Laser Power and Powder Flow Rate on Dilution Rate and Surface Finish Pr Laser Metal Deposition of Titanium Alloy	•
Rasheedat M. Mahamood, Esther T, Akinlabi, Moses G. Owolabi	
Development of Excellent Water-Repellent Coatings for Metallic and Ceramic Surface	es11
Aditya Kumar	
Fabrication of Durable and Renegerable Superhydrophobic Coatings on Metallic Sul Industrial Applications	
Priya Varshney and Soumya Sanjeev Mohapatra	
Sustainable Hydrogen Generation Substrates, Catalysts and Methods: An Overview	21
JA Adeniran, JJ deKoke, ET Akinlabi and TC Jen	
Application of Central Composite Design in Investigating the effect of Heat Treatmen Mechanical Properties of AISI 440C Martensitic Stainless Steel	
Charnnarong Saikaew and Anuparp Wijop	
Electro-Discharge Machining of <i>Ti-6Al-4V</i> Alloy Using <i>Cu-TaC</i> Compact Electrode will Reactions and their Effects on the Machined Surface	
Mohammed Baba Ndaliman, Ahsan Ali Khan, and Ruth Anayimi Lafia-Araga	

Effect of Particle Sizes on the Thermophysical Properties of Palm Kernel Shell Based Brake Pads38  R. S. Fono-Tamo
Microstructure and Electrical Resistivity Properties of Copper and Aluminium Friction Stir Spot Welds42
Mukuna Patrick Mubiayi, Esther titilayo Akinlabi and Mamookho Elizabeth Makhatha
Effect of Process Parameters on Tensile Strength and Morphology of Friction Stir Spot Welds of
Aluminium and Copper
Mukuna Patrick Mubiayi, Esther titilayo Akinlabi and Mamookho Elizabeth Makhatha
Applying Thermal Electric Cooler and Forced Convection to Cooling the RC Facades which Contain  Chimney Pipes Structure
San-Shan Hung, Jui-Lin Tsai, Chih-Yuan Chang, and Chien-Pang Lin
Temperature Control of an Energy Integrated Solid Oxide Fuel Cell System60
Nawadee Srisiriwat and Chananchai Wutthithanyawat
Prediction of Central Temperature Raise in Silica/CB filled SSBR/BR Compounds under Dynamic Compression
Shuang Wang, Xiaodong Zhang, Yuhua Zeng, Yaoshan Li, Zhaohui Chen
Session 2: Mechanical Power and Control Engineering  Rigid Body Dynamics Analysis in Design of Cantilever Beam of Entertainment Equipment Based on Solidworks-Motion
Yong-kui LI, Lu WANG, Yun SONG, Ping ZHAO
Research and Applications of the Hybrid Cameras Visual Servo Robot74
Guoliang SHI, Dan Chen
Research on the Control Method of 3D Printer based on FDM Technology80
Yin He, Wen Quangang, Lin Gang, Li Tingting
Finite Element Analysis on the Stress State of Rope Hoisting Equipment based on the ABAQUS84
DU Wenzheng, MA Baozhu, CAO Dazhi, and XIE Zheng
The Study of Principal Axis Controller in Open CNC System89
Lin Zhao
Research of large parts of the NC flexible logistics unit
Guangku Xue
Session 3: Mechanical Design and Manufacturing System
Contact Analysis of Tooth-locked Quick Closure in the Bast Fiber Modification Kettle97
Zhu Zina, Lai Leijie

Effects of Forces on the Welding Tool during the Dissimilar Joining of Aluminium and Copper102
Oluwatoyin Olabisi Ewuola, Esther Titilayo Akinlabi, Daniel Makundwaneyi Madyira, and Stephen
Akinwale Akinlabi
A Passive Control Method of HAWT Blade Cyclical Aerodynamic Load Induced by Wind Shear106
Hong-sheng Chen, Tien-chien Jen
Simulation Research on Bearing Lubricating Micro-jet Driven by Piezoelectric Ceramic110
Kai Li, Jun-kao Liu, Rui Yang, Wei-shan Chen, and Lu Zhang
Flywheel Energy Storage System with PermanentMagnetic Bearing and Spiral Groove Bearing116
Yujiang Qiu and Hongqin Ding
Research on Key Technologies of Magnetic Power Tools121
Hui Zhang
Modeling and Characteristic Analysis of a Marine Condenser based on Improved PSO-RBF Algorithm125
Huang Lin, Cheng Gang, Zhu Guoqing
The Research of Cross-flow Instabilities Transition Prediction Method based on Spalart-Allmaras-Gamma-Theta Transition Model
Jiakuan Xu, Junqiang Bai, and Ziyuan Fu
Design and Sustainability of a Biogas Plant for Domestic Use134
Tresor K. Kumba, Esther T. Akinlabi, and Daniel M. Madyira
Optimal Design and Modeling of Variable-density Triangular Honeycomb Structures138
Xin Jin, Guoxi Li, Song Gao, and Jingzhong Gong
Session 4: Mechatronics and Electrical Automation
Design the Control System Circuit of Vacuum Type Injection Machine144
Chang Zhong Wu, Shuai Shuai Lu, and Fu You Zhang
Distributed Fault Self-healing System and Identification and Management Method for Topology of The Smart Distribution Network
Yi ZHENG, Wei CON
Study on Polynomial Modelling of Detailed Multi-Machine Power Systems154
Yong Wan
Design on the Planar Magnetic Integrated EMI Filter Based on U-shaped Magnetic Core159
Li Jianjiang, Chen Lili, Zhang Xuemei, Huang Long, Lun Cuifen, Chen Lidong
Research of a loop-type sensor embedded in an insulator in 252kV GIS for partial discharge
measurement
Xizi Zhang, Chengrong Li, Shusheng Zheng, Hongxin Ji, Qifu Lu, and Zengbing Wang

Passive Filter Design with Considering Characteristic Harmonics and Harmonic Resonance of Electrified
Railway174
Jinhao Wang, Min Zhang, Shengwen Li, Tingdong Zhou, and Huijie Du
Analysis of Power Quality Issues of Electrified Railway
Jinhao Wang, Huipeng Li, Lei Feng, Long Xu, Xiaohui Lv, and Yonghai Xu
Directional Couplers Based on Substrate Integrated Waveguide
Ning Zhang, Qing Liu, and Jin-Kui Yan
Session 5: Vehicle Engineering
Analysis of the Mode Convertion from FWS to 4WS without Problem of Rear Overhang Swing186
Zhao Hui-yong, Zhang Guang-de, and Wang Bao-hua
An Optimal Matching Test on Vehicle Power Transmission System
Luo Yongqian
The Virtual Design and Experiment Study of Multi-Purpose Vehicle
Li Hongxun, Meng Xiangde, Li Lishun, and Qiu Yao
Application of Uniform Design in Deformation and Mass Improvement of an On-Road Bicycle Frame20
Yung-Chang Cheng, Wei-Siang Sun, Tsung-Han Huang, and Cho-Pei Jiang
Session 6: Aerospace Engineering
Multidisciplinary Optimization of Subsonic Wing Planform using Free Form Deformation20
Xiaolong He, Junqiang Bai and Liang Xin
Mechanical and Aerodynamic Study of 2D Trailing Edge Variable Camber System for Civil Transport
Aircraft
Shen Guangchen, Bai Junqiang, Liu Nan
Investigation of the Variable Camber Continuous Trailing Edge Flap on the Aerodynamic Performance of the Supercritical Airfoil
Tongbiao Guo, Junqiang Bai and Tihao Yang
Optimization Design of Hybird Laminar Flow Control Airfoil Using Directly Manipulated Free-form  Deformation Technique
Bin Guo, Junqiang Bai and Yayun Shi
Supercooled Large Droplets Impingement Simulation of 3-element Airfoils
Feifei Qin, Junqiang Bai and Xin Li

**Author Index**