

# **9th International Conference on Mechatronics and Control Engineering (ICMCE 2020)**

Held online due to COVID-19

IOP Conference Series: Materials Science and Engineering  
Volume 922

Rome, Italy  
22 - 24 July 2020

ISBN: 978-1-7138-3167-9  
ISSN: 1757-8981

**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.**

This work is licensed under a Creative Commons Attribution 3.0 International Licence.  
Licence details: <http://creativecommons.org/licenses/by/3.0/>.

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. (2021)

For permission requests, please contact the Institute of Physics  
at the address below.

Institute of Physics  
Dirac House, Temple Back  
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481  
Fax: 44 1 17 920 0979

[techtracking@iop.org](mailto:techtracking@iop.org)

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## **CONTROL SYSTEM AND ENGINEERING**

REFERENCE TRACKING OF DYNAMIC SYSTEM USING PREFILTER AND INTEGRAL EXTENSION.....	1
<i>Jean Oscard Domguia Teto, Seewig Jörg</i>	
INVARIANCE AND CONTROLLED INVARIANCE IN SWITCHING STRUCTURED SYSTEMS WITH APPLICATION TO DISTURBANCE DECOUPLING .....	6
<i>G Conte, A M Perdon, E Zattoni, C H Moog, E Scharbarg</i>	
DEVELOPMENT OF HIGH-PERFORMANCE SAFETY CONTROLLER FOR EXCAVATOR .....	16
<i>Ka An</i>	
ENERGY HARVESTING FROM PNEUMATIC SECONDARY SUSPENSIONS FOR VEHICLE MONITORING .....	21
<i>A Genovese, G A D'Angelo, S Strano, M Terzo</i>	
A PHYSICAL-BASED OBSERVER FOR VEHICLE STATE ESTIMATION AND ROAD CONDITION MONITORING .....	27
<i>B Lenzo, G Ottomano, S Strano, M Terzo, C Tordela</i>	
MODELLING AND SIMULATION OF DAMAGE MECHANISMS IN RAILWAY VEHICLE-TRACK INTERACTION.....	33
<i>F Ciuffini, F Favo, S Giulianelli, A Miele, G R Sitongia, S Strano</i>	
AN ACTIVE COMPLIANCE CONTROL FOR A ROBOTIC WOUND CLOSURE SYSTEM .....	39
<i>Edward H. Currie, Y. M Zhao, Louis Kavoussi, Sina Y. Rabbany</i>	
DESIGN AND DEVELOPMENT OF AN AUTOMATED FLUID MANAGEMENT SYSTEM FOR ENDOSCOPY AIDED GYNAECOLOGICAL SURGERIES.....	45
<i>S P Hettiarachchi, G C K Pathirana, M R Perera, Y W R Amarasinghe, M A M M Jayawardane, V T Dau</i>	

## **ELECTRONICS AND COMMUNICATION TECHNOLOGY**

VEHICLE POSITIONING SYSTEM USING V2X THAT COMBINES V2V AND V2I COMMUNICATIONS .....	51
<i>Geon-Hee Kim, Dong-Sung Pae, Woo-Jin Ahn, Koung-Suk Ko, Myo-Tae Lim, Tae-Koo Kang</i>	
AN ALGORITHM FOR AUTOMATIC GRASPING AN UHF RFID PASSIVE TAG .....	57
<i>Emidio DiGiampaolo, Francesco Martinelli</i>	
GPS DATA INTEGRATION TO REDUCE DRIVING EMISSIONS OF MHEVS IN REAL OPERATING CONDITIONS .....	62
<i>Marika Fanesi, David Scaradozzi</i>	
MULTIPHYSICS DESIGN AND OPTIMIZATION OF A VIBRATION-BASED ENERGY HARVESTER FROM PANTOGRAPH-CATENARY INTERACTION.....	68
<i>A Genovese, S Schiano, S Strano, M Terzo, M Iodice, M Indolfi, G Coppola</i>	

**Author Index**