## 2021 6th International Conference on Mechanical Engineering and Robotics Research (ICMERR 2021)

Krakow, Poland 11 – 13 December 2021



IEEE Catalog Number: CFP21BJ9-POD ISBN: 978-1-6654-0643-7

## Copyright © 2021 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:
 CFP21BJ9-POD

 ISBN (Print-On-Demand):
 978-1-6654-0643-7

 ISBN (Online):
 978-1-6654-0642-0

#### **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**

# 20216th International Conference on Mechanical Engineering and Robotics Research (ICMERR)

Prefacev		
Со	Committees	
_		_
<b></b>	Mobile Robots and Motion Planning	
Inc	orporating Moving Landmarks within 2D Graph-Based SLAM for Dynamic Environments	1
	Peter Aerts, Peter Slaets, Eric Demeester	
Dyı	namic Power Management on a Mobile Robot	8
	Rodrigo de Carvalho Techi, Plinio Thomaz Aquino Jr	
	bot-guided Lightweight Engineering Fixtures: Process Lightweight Engineering for More Flexible, source-saving and Energy-efficient Production	15
	Marten Geschonke, Markus Rössinger, Benjamin Hecht, Marcel Todtermuschke, Steffen Ihlenfeldt	
ΑF	Position-Control-Based Framework for Dynamic and Robust Quadrupedal Trotting	22
	Boxing Wang, Lihao Jia, Song Liu, Haoyu Zhang, Zeya Yin	
Gra	aph-based Motion Planning with Primitives in a Continuous State Space Search	30
	Matheus V. A. Pedrosa, Tristan Schneider, Kathrin Flaßkamp	
Pai	rticle filter as the localization of the robot on the football pitch	40
	Paweł Żakieta, Maciej Zieja, Bartosz Bok	
<b></b>	Mechanical Design and Control System	
Ass	sessment of a Test Rig for the Measurement of Contact Properties of Bolted Joints	46
	Murat Can Tuzel, Kenan Y. Sanliturk	

Keris Geometry Accuracy Using 3D Scanning Technique5
Wahyu Caesarendra, Maciej Sulowicz, Agus Suprihanto, Dwi Basuki Wibowo, Pg Emeroylariffion Abas Sumar Hadi Suryo, Aan Wibiantoro
Multispectral data classification with deep CNN for plastic bottle sorting5
Romans Maliks, Roberts Kadikis
Experimental investigation of the effect of prismatic roughness on the performance of belt skimmers in oil spill recovery applications
Mohammed Farid Khalil, Abdelrahman Amr Elmaradny, Eslam Reda Lotfy
Design and Analysis of Control Circuit for Danger Alarm Light and Turn Light of Vehicle Based on Multisim
Jianwei Ma
Experimental Investigation for The Influences of Bioinspired Tubercles Length on Aerodynamic Performance of Highly Cambered Airfoils in Low-Re Transient-Flow Regime
Amr Emam, Essam M. Wahba, Ihab G. Adam
An Adaptive Fuzzy Observer Based Delay Compensator for Time Delayed Bilateral Teleoperation Systems .
8 Linping Chan, Qingqing Huang, Ping Wang, Yan Han
A Self-rescue Mechanism for an In-pipe Robot for Large Obstacle Negotiation in Water Distribution Systems
Saber Kazeminasab, Moein Razavi, Sajad Dehghani, Morteza Khosrotabar, Katherine Banks
Object class-agnostic segmentation for practical CNN utilization in industry*9
Anas Gouda, Abraham Ghanem, Pascal Kaiser, Michael ten Hompel
♦ Vehicle Design and Manufacturing Engineering
Modeling and Simulation of Automatic Emergency Braking Control System for Unmanned All-terrain Vehicle
Jianwei Ma
Analysis of Stress on Boom Excavator V EC650BE Using Finite Element Method11
Wahyu Caesarendra, Kirana Astari Pranoto, Janusz Goldasz, Pg Mohd Iskandar Hj Petra, Macie Sulowicz, Juliana Zaini, Sumar Hadi Suryo, Gunawan Dwi Haryadi

Finite Element Analysis of Key Parts of Deformation Wheel for All Terrain Vehicle11	
Jianwei Ma	
Study on effectiveness of vibrating wheel's shape for improving running performance of small planetary exploration rovers with wheels on loose ground	
Tomohiro Watanabe, Kojiro lizuka	
Aeroelastic Model of a Morphing Wing for Control Design and Optimization	
Ales Balon, Petr Benes, Zbynek Sika	
Study on Relationship between Traveling State and Chassis Strain at Traveling Loose Soil for Rovers 136	
Kohei Inaba, Kojiro lizuka	
Finite Element Analysis of Transformable Wheel for Special Vehicle Based on ANSYS	
Jianwei Ma	