

# **6th International Conference on Mechatronics and Mechanical Engineering (ICMME 2019)**

MATEC Web of Conferences Volume 306 (2020)

Osaka, Japan  
27 – 30 November 2019

**Editor:**

**Mohd Hamdi Abdul Shukor**

ISBN: 978-1-7138-0292-1

**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 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. (2021)

For additional information, please contact EDP Sciences – Web of Conferences at the address below.

EDP Sciences – Web of Conferences  
17, Avenue du Hoggar  
Parc d'Activité de Courtabœuf  
BP 112  
F-91944 Les Ulis Cedex A  
France

Phone: +33 (0) 1 69 18 75 75

Fax: +33 (0) 1 69 28 84 91

[contact-edps@webofconferences.org](mailto:contact-edps@webofconferences.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

INVESTIGATION ON DYNAMIC INTERACTION OF MULTIPLE CLEARANCE JOINTS FOR FLAP ACTUATION SYSTEM.....	1
<i>Wan Qi, Geng Liu, Ma Shangjun, Tong Ruiting</i>	
A STUDY OF HYBRID ENERGY STORAGE SYSTEM FOR ELECTRIC VEHICLE AIR CONDITIONING SYSTEM .....	6
<i>Veerathanaporn Phucha, Phaoharuhansa Danai, Yamakita Masaki</i>	
DYNAMIC MODEL OF PLANETARY ROLLER SCREW MECHANISM WITH CONSIDERING TORSIONAL DEGREE OF FREEDOM.....	11
<i>Wu Linping, Ma Shangjun, Wan Qi, Liu Geng</i>	
STUDY OF REGENERATIVE BRAKING SYSTEM AND BRAKE FORCE USING PULSE WIDTH MODULE.....	16
<i>Chueprasert Warunchit, Phaoharuhansa Danai</i>	
A NEW IMPACT DYNAMICS MODEL OF A CLEARANCE JOINT CONSIDERING THE ADHESIVE EFFECTS IN SPACE ENVIRONMENT .....	21
<i>Tong Ruiting, Quan Zefen, Wan Qi, Fu Xiaojun, Liu Geng</i>	
NUMERICAL SIMULATIONS OF BLOOD CELL FLOW IN NON-NEWTONIAN FLUID .....	26
<i>Shitara Kazuhiro, Hyakutake Toru</i>	
NUMERICAL SIMULATION OF SLURRY FLOW IN HORIZONTAL PIPE BASED ON CFD-DEM.....	30
<i>Fan Jinchao, Yao Benchun, Hao Yi, Zhang Shimin, Zhu Xiaoxiao</i>	
ANALYTICAL CALCULATION OF ANNULAR GAP THROTTLING OF DAMPING VALVE.....	36
<i>Chen Yijie, Gao Xiaodong, Han Xiaoling, Zhao Ning, Wan Yiqiang</i>	
EXPERIMENTAL RESEARCH ON STATIC STIFFNESS OF THE PLANETARY ROLLER SCREW MECHANISM.....	40
<i>Shangjun Ma, Guanyu Wu, Jianxin Zhang, Geng Liu</i>	
VERTICAL DYNAMIC ANALYSIS OF BALLASTLESS TRACKS ON TRAIN-TRACK-BRIDGE SYSTEM .....	44
<i>Xie Haoran, Yan Bin, Huang Jie</i>	
MODELLING OF ELECTRO-MECHANICAL SERVO SYSTEM BASED ON THE PLANETARY ROLLER SCREW MECHANISM.....	49
<i>Zhang Jianxin, Du Chuanming, Ma Shangjun, Liu Geng</i>	
A REFERENCED CYBER PHYSICAL SYSTEM FOR COMPRESSOR MANUFACTURING .....	53
<i>Cao Jin, Wang Junliang, Lu Junqing</i>	
DEVELOPMENT OF ADVANCED INTUMESCENT FLAME-RETARDANT BINDER FOR FIRE RATED TIMBER DOOR.....	59
<i>Jong Kwang Yin Jessica, Ming Chian Yew, Ming Kun Yew</i>	
NUMERICAL INVESTIGATION ON MAGNETICALLY ACTUATED TUNABLE MICRO LIQUID LENS .....	63
<i>Wu Shi-Hua, Zhu Gui-Ping, Huang Hu-Lin</i>	

IMPLEMENTATION AND INVESTIGATION OF A FORCE CONTROL FOR A FORMING DEMONSTRATOR WITH COUPLED SERVO DRIVES .....	70
<i>Sewohl André, Schleinitz Armin, Schlegel Holger, Putz Matthias</i>	
RESEARCH ON LOAD SIMULATOR CONTROL STRATEGY BASED ON BP NEURAL NETWORK AND PID METHOD .....	79
<i>Zhou Yong, Zhang Yubo, Yang Tianhao</i>	
DESIGN OF THE LANDSLIDE MULTI-FACTOR MONITORING SYSTEM BASED ON THE GNSS TECHNOLOGY .....	84
<i>Qingjia Meng, Chenhui Wang, Wei Guo</i>	
MODELLING OF ARTIFICIAL NEURAL NETWORK TO CONTROL THE COOLING RATE OF A LABORATORY SCALE RUN-OUT TABLE.....	88
<i>Prabir Biswas, Md Safwan Mondal, Saikat Mookherjee, Pranibesh Mandal</i>	
DESIGN OF DYNAMIC CONTROLLERS FOR CONTINUOUS PATHS ON PARALLEL PLATFORMS (SLIDE MODES AND PD+).....	93
<i>Valencia Angie, Mauledoux Mauricio, Castañeda Claudia</i>	
DESIGN OF RAPID MONITORING SYSTEM OF GEOLOGICAL DISASTER BASED ON LORA .....	97
<i>Chenhui Wang, Qingjia Meng</i>	
SIMULATION AND DISTURBANCE ESTIMATION OF SPEED-CONTROLLED MECHATRONIC DRIVE SYSTEMS.....	102
<i>Schöberlein Chris, Norberger Manuel, Schlegel Holger, Putz Matthias</i>	
VIBRATION AND COOLING PERFORMANCES OF PIEZOELECTRIC COOLING FAN: NUMERICAL AND EXPERIMENTAL INVESTIGATIONS .....	113
<i>Liu Thomas Jin-Chee, Chen Yu-Shen, Ho Hsi-Yang, Liu Jyun-Ting</i>	
DESIGN AND TESTING OF A VALVELESS PIEZOELECTRIC PUMP WITH CONICAL VORTEX DIODES .....	118
<i>Zou Lei, Li Kai, Huang Jun</i>	
ANTI-SEISMIC CHARACTERISTICS OF SAFETY VALVE AND ITS SPRING FAILURE PREDICTION ANALYSIS.....	122
<i>Meng Fanrong, Zhang Huibing, Dai Ye, Zhang Hanbo, Wei Wenqiang, Liu Rui</i>	
MINIMIZATION FOR CURRENT PEAK-TO-PEAK VALUE IN SWITCHED RELUCTANCE MOTOR .....	127
<i>Shang Chaoyi, Xu Aide, Li Qianni, Huang Lepeng</i>	
VIBRATION ENERGY HARVEST FOR LOW FREQUENCY USING DOUBLE-PIEZOELECTRIC CANTILEVER BEAM .....	132
<i>Tuma Chuttipong, Phaoharuhansa Danai</i>	
MINIMIZATION TORQUE RIPPLE FOR SRM BASED ON FLUX LINKAGE PARTITION IN DB-DTFC.....	137
<i>Li Qianni, Xu Aide, Shang Chaoyi, Huang Lepeng</i>	
VERIFICATION OF STRAIN TRANSFER CHARACTERISTICS OF DISTRIBUTED SURFACE-ATTACHED FBGS ON AIRCRAFT WINGS .....	142
<i>Ma Zhen, Chen Xiyuan</i>	

REAL-TIME ESTIMATION METHOD OF ROLL ANGLE BASED ON LEAST SQUARES RECURSION .....	146
<i>Jingsheng Chen, Chuanjun Li, Peisen Hu</i>	
PBL PROGRAM PRODUCING FLYING ROBOT IN MECHANICAL AND AEROSPACE ENGINEERING DEPARTMENT .....	151
<i>Hara Susumu, Kuroda Kazuhide, Aoi Yu, Nakagami Koki, Hashizume Koya, Hata Seiichi</i>	
RESEARCH ON RAPID ASSEMBLY TECHNOLOGY OF HELICOPTER TRANSMISSIONS .....	156
<i>Haiwei Wang, Lulu Li, Sheng Yuan</i>	
AERODYNAMIC EFFECTS OF CORRUGATION CONFIGURATIONS IN SWEEPING- PITCHING FLIGHT .....	162
<i>Xuan Haibin, Hu Jun, Yu Yong, Zhang Jiaolong</i>	

**Author Index**