Extrica L Conferences

ISSN ONLINE 2538-8479 ISSN PRINT 2345-0533

> October 2024 VOLUME 56

Mechanical Engineering

Multidisciplinary Engineering

Materials Science and Technology

Vibroengineering Procedia





OPEN ACCESS PROCEEDINGS

Editor in Chief

Minvydas Ragulskis Editorial Board Mahmoud Bayat Rafał Burdzik Jinde Cao Maosen Cao Sezgin Ersoy Chen Lu Nicola Nisticò Subhash Rakheja Vinayak Ranjan Miguel A. F. Sanjuan Gangbing Song Vincentas Veikutis Xiao-Jun Yang

Kaunas University of Technology, (Lithuania)

The University of Texas at Arlington, (United States) Silesian University of Technology, (Poland) Southeast University, (China) Hohai University, (China) Technische Universität Braunschweig, (Germany) Beihang University, (China) Sapienza University of Rome, (Italy) Concordia University of Rome, (Italy) Concordia University, (Canada) Rowan Uviversity, (United States) University Rey Juan Carlos, (Spain) University of Houston, (United States) Lithuanian University of Health Sciences, (Lithuania) China University of Mining and Technology, (China) minvydas.ragulskis@ktu.lt

ranjan@rowan.edu rafal.burdzik@polsl.pl jdcao@seu.edu.cn cmszhy@hhu.edu.cn sersoy@marmara.edu.tr luchen@buaa.edu.cn nicola.nistico@uniroma1.it subhash.rakheja@concordia.ca vinayak.ranjan@bennett.edu.in miguel.sanjuan@urjc.es gsong@uh.edu vincentas.veikutis@lsmuni.lt xjyang@cumt.edu.cn

VP Vibroengineering PROCEDIA

Vibroengineering PROCEDIA Volume 56 contains papers presented at the 70th International Conference on Vibroengineering in Cluj-Napoca, Romania, October 18-19, 2024. The main theme of the Conference is "Advancements in Mechatronics: Integrating Vibrations, Robotics, Measurements and Mathematical Models".

Aims and Scope

Journal publishes original papers presenting the state of the art in vibroengineering of dynamical systems. The list of principal topics:

- Measurements in engineering
- Mathematical models in engineering
- Acoustics, noise control and engineering applications
- Mechanical vibrations and applications
- Fault diagnosis based on vibration signal analysis
- Vibration control, generation and harvesting
- Seismic engineering and applications
- Modal analysis and applications
- Vibration in transportation engineering
- Flow induced structural vibrations
- Oscillations in biomedical engineering
- Chaos, non-linear dynamics and applications
- Oscillations in electrical engineering
- Fractional dynamics and applications
- System dynamics in manufacturing system modeling
- Dynamics of smart and functionally graded materials

All published papers are peer reviewed and crosschecked by plagiarism detection tools.

More information is available online https://www.extrica.com/journal/vp

Vibroengineering PROCEDIA is referred in:

Scopus: ELSEVIER Bibliographic Database. EI Compendex: ELSEVIER Bibliographic Database. EBSCO: Academic Search Complete; Computers & Applied Sciences Complete; Central & Eastern European Academic Source; Current Abstracts; TOC Premier. Gale Cengage Learning: Academic OneFile Custom Periodical; Science in Context. ResearchGate: https://www.researchgate.net Scilit: https://www.scilit.net Dimensions: https://www.dimensions.ai Semantic Scholar: https://www.semanticscholar.org Google Scholar: https://scholar.google.com CORE: https://core.ac.uk Ulrich's Periodicals Directory: https://ulrichsweb.serialssolutions.com CNKI Scholar: http://eng.scholar.cnki.net cnpLINKer (CNPIEC): http://cnplinker.cnpeak.com WanFang Data: https://www.wanfangdata.com.cn TDNet: https://www.tdnet.io WorldCat Discovery Services: https://www.oclc.org/en/worldcat-discovery.html MyScienceWork: https://www.mysciencework.com

Crossref: https://search.crossref.org

Content is archived in Martynas Mazvydas National Library of Lithuania

Internet: https://www.extrica.com E-mail: publish@extrica.com Publisher: Extrica

70th International Conference on VIBROENGINEERING

October 18-19, 2024, in Cluj-Napoca, Romania

The main theme of the conference: Advancements in Mechatronics: Integrating Vibrations, Robotics, Measurements and Mathematical Models

General Topics of the Conference:

- Mechanical vibrations and applications
- Fault diagnosis based on vibration signal analysis
- Seismic engineering and applications
- Vibrations in transport engineering
- Vibration control, generation and harvesting
- Acoustics, noise control and engineering applications
- Flow induced structural vibrations
- Modal analysis and applications
- System dynamics in manufacturing system modelling
- Materials and measurements in engineering
- Mathematical models in engineering
- Vibration Engineering
- Robotics and Mechatronics
- Vibration problems in smart Transportation Systems and Logistics
- Energy (topics related to vibroengineering)
- Artificial Intelligence and Machine Learning in vibroengineering
- Signal Processing and electronic circuits (topics related to vibroengineering)
- Electronics and power Systems (topics related to vibroengineering)
- Data analysis and visualization (topics related to vibroengineering)

Chairs:

Zoltan-Iosif Korka	Babes-Bolyai University of Cluj-Napoca, Romania
Cristian Tufisi	Babeș-Bolyai University, Romania

Scientific Organizing Committee Members

Gilbert-Rainer Gillich	Babes-Bolyai University of Cluj-Napoca, Romania
Tiberiu Manescu	Universitatea "Aurel Vlaicu" din Arad, Romania
Zeno-Iosif Praisach	Babes-Bolyai University, Romania
Mihai Vasilescu	Babeş-Bolyai University, Romania

VP Vibroengineering PROCEDIA

OCTOBER 2024. VOLUME 56, PAGES (1-208), ISSN PRINT 2345-0533, ISSN ONLINE 2538-8479

Contents

ANALYSIS OF VIBRATION CHARACTERISTICS OF SHIP PROPELLER SPINDLE Dan Li, Youwei Du, Yuqin Tian		
DESIGN OF MONITORING SYSTEM FOR MATERIAL VIBRATION SCREENING EQUIPMENT JUAN WANG, HAO SUN	8	
ANALYSIS AND OPTIMIZATION OF THE DYNAMIC RESPONSE CHARACTERISTICS OF AIRCRAFT CARGO RACK Zheng Zhang, Chunxiang Wang, Qi Zhang	15	
SUBSTANTIATION OF THE METHODOLOGY FOR CALCULATING THE DESIGN OF A SMALL-SIZED HYDRAULIC PULSE VIBRATOR Roman Obertyukh, Andrii Slabkyi, Oleksandr Petrov, Dmytro Bakalets	22	
SIMULATION AND EXPERIMENTAL TESTING OF LOCOMOTION CHARACTERISTICS OF A VIBRATION-DRIVEN SYSTEM WITH A SOLENOID-TYPE ACTUATOR VITALIY KORENDIY, OLEKSANDR KACHUR, ROMAN LITVIN, IHOR NAZAR, VASYL BRYTKOVSKYI, SERHIJ NIKIPCHUK, MYKOLA OSTASHUK	29	
VIBRATION CONTROL, GENERATION AND HARVESTING		
DYNAMIC CHARACTERISTICS ANALYSIS OF SHOCK ABSORBER BASED ON FLUID SIMULATION YING LI, RAN YANG	36	
COMPARISON OF PASSIVE AND SEMI-ACTIVE PIEZOELECTRIC TRANSDUCER DAMPING OF CANTILEVER OSCILLATION MUSTAFA T. HUSSEIN, AMEEN M. AL-JUBOORI, SARAH Z. MAHDI	42	

SEISMIC ENGINEERING AND APPLICATIONS

SEISMIC RESISTANCE ANALYSIS AND OPTIMIZATION OF GYMNASIUM TRUSS STRUCTURE		
CHUNXIANG WANG, WENCHENG LI, YUE ZHAO		
SEISMIC ISOLATION DESIGN OF HIGH-RISE SHEAR WALL STRUCTURES IN HIGH-INTENSITY AREAS	55	
SEISMIC RESISTANCE ANALYSIS AND OPTIMIZATION OF GYMNASIUM TRUSS STRUCTURE CHUNXIANG WANG, WENCHENG LI, YUE ZHAO SEISMIC ISOLATION DESIGN OF HIGH-RISE SHEAR WALL STRUCTURES IN HIGH-INTENTIY AREAS SHUFENG LI, SHUTING DU, ZHIHUI ZHANG, WEIJIE ZHU MODAL ANALYSIS AND APPLICATIONS OPTIMIZATION OF REDUCTION GEAR IN ANCHOR WINCH BASED ON MODAL ANALYSIS XIAOYU LIU, XIANGYAO WU, ALDRIN D. CALDERON MODAL ANALYSIS AND OPTIMIZATION DESIGN OF ULTRA-HIGH ACCELERATION PLATFORM RAIL FRAME ZHIYUAN ZHANG, JIAN ZHANG, SEN ZHANG MODAL ANALYSIS AND SEISMIC OPTIMIZATION OF MULTI-STOREY GYMNASIUM FRAME YUE ZHAO, CHUNXIANG WANG, WENCHENG LI MODAL ANALYSIS OF KEY COMPONENTS OF CRUSHER BASED ON DIGITAL SIMULATION TECHNOLOGY YANNA YAO, YAQING LI DYNAMICS ANALYSIS AND COLLABORATIVE OPTIMIZATION OF VEHICLE STEERING MECHANISM LINING ZHAO, XIAOLIN CUI, WENJING WANG VIBRATION IN TRANSPORTATION ENGINEERING SIMULATION ANALYSIS OF FORCE AND FATIGUE LIFE OF CIRCULAR WHEEL OF CRAWLER VEHICLE CHAO WANG, YU CHEN, TAO XUE, TONGXIN MA, RUIPENG ZHANG TRIANGULAR STATE STRESS AND DEFORMATION ANALYSIS OF DEFORMABLE TRACKED WHEEL YU CHEN, YU CAO, LEI ZHANG, MENGFENG LEI FLOW INDUCED STRUCTURAL VIBRATIONS ANALYSIS OF AERODYNAMIC CHARACTERISTICS OF DRONE WING BASED ON CFD		
MODAL ANALYSIS AND APPLICATIONS		
Optimization of reduction gear in anchor winch based on modal analysis Xiaoyu Liu, Xiangyao Wu, Aldrin D. Calderon	62	
MODAL ANALYSIS AND OPTIMIZATION DESIGN OF ULTRA-HIGH ACCELERATION PLATFORM RAIL FRAME Zhiyuan Zhang, Jian Zhang, Sen Zhang	68	
MODAL ANALYSIS AND SEISMIC OPTIMIZATION OF MULTI-STOREY GYMNASIUM FRAME	74	
YUE ZHAO, CHUNXIANG WANG, WENCHENG LI		
MODAL ANALYSIS OF KEY COMPONENTS OF CRUSHER BASED ON DIGITAL SIMULATION TECHNOLOGY YANNA YAO, YAQING LI	81	
DYNAMICS ANALYSIS AND COLLABORATIVE OPTIMIZATION OF VEHICLE STEERING MECHANISM Lining Zhao, Xiaolin Cui, Wenjing Wang	88	
VIBRATION IN TRANSPORTATION ENGINEERING		
SIMULATION ANALYSIS OF FORCE AND FATIGUE LIFE OF CIRCULAR WHEEL OF CRAWLER VEHICLE Chao Wang, Yu Chen, Tao Xue, Tongxin Ma, Ruipeng Zhang	95	
TRIANGULAR STATE STRESS AND DEFORMATION ANALYSIS OF DEFORMABLE TRACKED WHEEL YULCHEN, YULCAO, LEI ZHANG, MENGEENG LEI	101	
ELOW INDUCED STRUCTURAL VIDRATIONS		
FLOW INDUCED STRUCTURAL VIBRATIONS		
ANALYSIS OF AERODYNAMIC CHARACTERISTICS OF DRONE WING BASED ON CFD Chunxiang Wang, Zheng Zhang, Qi Zhang	107	
Investigation of dynamic response characteristics of light fixed-wing aircraft Qi Zhang, Zheng Zhang, Chunxiang Wang	114	

VIANG	W/IT	GUO	T AT	VANG	IEIII	VAN	TAO	CHU	XIII	VE	WANG	HAO	SUO
MANU	w0,	000	LAI	I ANO,	, ברבים	IAN	IAU	CIIO,	, 2110	тĽ	WANO,	IIAO	500

121

ACOUSTICS, NOISE CONTROL AND ENGINEERING APPLICATIONS

Analysis and optimization of abnormal noise in lubricating oil circuit of diesel engine Yongwei Tang, Lianmao Wu, Xiaoping Gong, Jingchang Chen, Zhao Chen, Hongjian Su, Lei Ren, Tao Zhang	128
MODAL ANALYSIS AND STRUCTURAL NOISE CONTROL OF VEHICLE BODY FRAME Xin Han, Xiubang Chi	135
RESEARCH ON DYNAMIC VIBRATION ABSORPTION TECHNOLOGY FOR POWER EQUIPMENT BASED ON ENERGY DEGRADATION JIMING SONG, JIANGANG MA, NING QIU, YALIN ZHAO, LV WANG, JIAO YAO	142
MATERIALS AND MEASUREMENTS IN ENGINEERING	
PREPARATION AND PROPERTIES OF POLYAMIDE ELASTOMERS BY A NEW SYNTHESIS ROUTE OF MICHAEL ADDITION REACTION HOUDONG RAO, YOUNA SHENG, DONGYANG ZHANG, LING ZHANG, ZIXIAN LI, LIUHE WEI, YUHAN LI	150
Reliability analysis of cable crimping terminals with different applicator tools Ilca Dacian, Manescu Tiberiu, Tufisi Cristian	157
INFLUENCE OF COPPER-IRON (CUFE) AND COPPER-TIN (CUSN) ALLOYS OVER MECHANICAL STRENGTH PROPERTIES IN CRIMPING PROCESS FLORIN DRAGOMIR, TIBERIU MANESCU, CRISTIAN TUFISI	163
MATHEMATICAL MODELS IN ENGINEERING	

FINITE ELEMENT ANALYSIS OF ROCKFALL IMPACT ON PIPELINES WITH DIFFERENT EROSION RESISTANT COATINGS YUE ZU, XU ZHANG, JIUFA LIU, YUNCHAO ZHANG, QI DING, ZHENFA JIA, XIAOYAN YANG, ZHEN CHEN	169
TRAJECTORY-BASED SYNTHESIS OF A SLIDER-CRANK MECHANISM FOR APPLICATIONS IN INERTIAL VIBRATION EXCITERS VITALIY KORENDIY, TARAS VILCHYNSKYI, VASYL LOZYNSKYY, ROMAN KACHMAR, YURII POROKHOVSKYI, ROMAN LITVIN	176
SYSTEM DYNAMICS IN MANUFACTURING SYSTEM MODELING	
A STUDY INTO THE FLUID POWER CONTROL CHARACTERISTICS OF A HYDROSTATIC TRANSMISSION FOR MOBILE MACHINERY	183

MOUJUN DAI, ZHONGFA WU, XUEGUAN LIAO, KAI YAN, WENLIN WANG

DYNAMICS AND OSCILLATIONS IN ELECTRICAL AND ELECTRONICS ENGINEERING

DEMAGNETIZATION OPTIMIZATION OF HYBRID EXCITATION EDDY CURRENT DAMPER

UNDER INTENSIVE IMPACT LOAD

Cor	JTE	NT	Ś
COI	N I L	181	L, D

STRUCTURAL DESIGN AND DYNAMIC CHARACTERISTIC ANALYSIS OF ADJUSTABLE	189
BADMINTON SERVING MACHINE	
WENCHENG LI, YUE ZHAO, CHUNXIANG WANG	
LUBRICATION OPTIMIZATION OF HIGH-SPEED TRAIN DRIVE GEARBOX Tian Ji, Changwen Tao, Tao Sun	196
DESIGN AND ANALYSIS OF FOLDING MECHANISM FOR AUTOMOTIVE SEATS BASED ON SPACE MAXIMIZATION Shijun Zhang, Xiaowei Huang, Shuai Li, Kefei Wang	202

Vibroengineering is an abbreviation of two words: vibration and engineering. Vibration phenomena play an important role in a wide range of mechanical, structural, electromechanical systems. Vibration engineering covers such topics as mechanical vibrations and applications, fault diagnosis based on vibration signal analysis, seismic engineering, acoustics and noise control, energy harvesting and vibration generation. Every consecutive Volume of Vibroengineering Procedia is dedicated to a separate conference in the series of International Conferences on Vibroengineering.





EXTRICA.COM