Proceedings
2011 World Congress on
Engineering and Technology

Oct. 28-Nov.2, 2011, Shanghai, China

IEEE PRESS

Proceedings
2011 World Congress on Engineering and Technology

Copyright and Reprint Permission: 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 Operations Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved. Copyright ©2011 by IEEE.

Compliant PDF Files

IEEE Catalog Number:	CFP 1148N -ART
ISBN:	978-1-61284-365-0

Conference CD-ROM Version

IEEE Catalog Number:	CFP 1148N-CDR
ISBN:	978-1-61284-363-6

Print Version

IEEE Catalog Number:	CFP 1148N -PRT
ISBN:	978-1-61284-362-9

Publisher: Institute of Electrical and Electronics Engineers,

Inc. Printed in Beijing, China

2011 World Congress on Engineering and Technology

(CET 2011)

http://www.engii.org/cet2011/ Oct. 28-Nov.2, 2011, Shanghai, China

Sponsors:

- **IEEE Beijing Section**
- **IEEE Wuhan Section**
- **Tongji University**
- **Wuhan University**
- **Engineering Information Institute**

Home

Welcome

On behalf of the Organizing Committee of 2011 World Congress on Engineering and Technology (CET 2011), it is my great pleasure to present this proceedings of the conference held in Shanghai, China, Oct. 28th to Nov.2nd, 2011. I would like to take this opportunity to thank all the authors and participants for their support to our conference.

With the development of technology, a great variety of research results are emerging. Following the rapid development trend, CET 2011 serves as a forum for the academic professionals and researchers to exchange the most updated information and achievements in those exciting research areas.

I would like to express our gratitude to our sponsors: IEEE Beijing Section, IEEE Wuhan Section, Tongji University, Wuhan University, and Engineering Information Institute. At the same time, we appreciate the contributions from our paper reviewers and the committee members. Your efforts make the conference a success.

Thanks again for your attention and support to our conference.

We are looking forward to seeing you again next year.

Dr. Victor Jin

CET 2011 General Chair

Conference Organizing Committee

Honorary General Chair

Prof. Daniel N.Riahi, University of Illinois at Urbana-Champaign-uiuc, USA

General Chair

Dr. Victor Jin, Ohio State University, USA

Technical Program Committee Chair

Prof. Nickolas S. Sapidis, University of Western Macedonia, Greece

Technical Program Committee Co-Chair

Prof. Weidong Zhao, Tongji University, Shanghai, China

Technical Program Committee

Prof. Harald Morgner, Physical Chemistry, University Leipzig,

Germany Dr. Wenyuan Liao, University of Calgary, Alberta, Canada

Prof. Andrzej Kloczkowski, Iowa State University, USA

Dr. Serge Lawrencenko, National University of Science and Technology (Moscow), Russia

Dr. Ahn Jong-Hoon, Hanyang University, Seoul, Korea (South)

Dr. Peihua Qiu, University of Minnesota, USA

Dr. Yu Zhuang, Texas Tech University, USA

Dr. Zhenyu Yan, Fair ISAAC Corporation (FICO), Research Division, USA

Dr. Zhen-Xing Tang, Hangzhou Wahaha Co. Ltd, Hangzhou, Zhejiang,

China Dr. Weiping Zhang, Shanghai Jiao Tong University, China Prof. Bin

Zheng, University of Pittsburgh, USA

Dr. Lijuan zhang, University of Auckland, New Zealand

Prof. Ravi Janardan, University of Minnesota--Twin Cities, USA

Dr. Shyh-Feng Chen, China University of Science and Technology,

USA Dr. Zhuming Bi, Purdue University at IPFW Campus, USA

Dr. José Reinaldo Silva, University of São Paulo,

France Dr. Jianwen Fang, University of Kansas, USA

Dr. Alessandro Margherita, University of Salento, Italy

Prof. Petar M. Mitrasinovic, Indian Institute of Technology Roorkee,

India Prof. Inmaculada Zamora, University of the Basque Country,

Spain Prof. Gianluca Elia, University of Salento, Italy

Prof. Imed Kacem, University Paul Verlaine – Metz (UPV-M),

France Prof. Eugene Levner, Holon Institute of Technology, Holon,

Israel Prof. Irinel Dragan, University of Texas at Arlington, USA

Prof. Zuo-Guang Ye, Simon Fraser University, Canada

Prof. George A. Gravvanis, Democritus University of Thrace,

Greece Prof. Wanyang Dai, Nanjing University, Nanjing, China

Dr. Chaoyi Pang, the Australian e-Health Research Centre, CSIRO, Australia Prof.

Hui Tang, Kunming University of Science and Technology,Yunnan, China Dr.

Amal Kumar Mondal, Vidyasagar University,Midnapore, West Bengal, India

Dr. Ki Young Kim, Samsung Advanced Institute of Technology, Yongin, Korea

(South) Dr. Sajjad Haider, College of Engineering King Saud University, Saudi-

arabia Prof. Kewen Zhao, University of Qiongzhou, China

Dr. Chiranjib Chakraborty, Vellore Institute of Technology, India

Dr. Raj Kumar, Institute of Nuclear Medicine and Allied Sciences, India

Prof. Abdul Q. M. Khaliq, Middle Tennessee State University, USA

Dr. Yufeng Wang, University of Texas, USA

Prof. Atef Sayed Abdel-Razek, National Research Centre, Egypt,

Egypt Dr. Zhongming Zhao, Vanderbilt University Medical Center,

USA Prof. Shuying Qu, Yantai University, China

Dr. Chiranjib Chakraborty, VIT University, India

Prof. Jean-Claude Thill, University of North Carolina at Charlotte,

USA Prof. Abderrahmane BAÏRI, Université Paris Ouest, France

Prof. Yu-Ran Luo, University of Science and Technology of China, China

Prof. Feng-Biao Guo, University of Electronic Science and Technology of China,

China Prof. Celin Hin, MIT, USA

Prof. Ulrich H.E. Hansmann, Michigan Technological University,

USA Prof. Agassi Melikov, Institute of Cybernetics, Azerbaijan

Publication Chair

Mengqi Zhou, IEEE Beijing Section, China

TABLE OF CONTENTS VOL05

PART01

0828-1907773 **EFFECTS OF TOTAL FLAVONOIDS FROM SEA BUCKTHORN LEAVES ON OSTEOBLASTS IN VITRO** 1
Xin Chen, Hong-zhu Liu, Wei Zhao, Hong-nan Liu, Yao Li

0829-1903875 **A NEW COPPER(II) POLYMERIC COMPLEX WITH BRIDGING DISSYMMETRICAL OXAMIDE LIGAND: SYNTHESIS,CHARACTERIZATION,CYTOTOXIC ACTIVITIES AND DNA BINDING STUDIES** 6
Fahui Li

0830-1929133 **EXPRESSION AND CLINICAL SIGNIFICANCE OF B7-H4 IN COLORECTAL CANCER** 10
Liu Jie, Zhao Jianqiang , Zhang Nan ,Dang Qi, Du Zhenhua, Lin Wenli,Sun Yuping

0831-1911031 **LYMPHATIC MICROVESSEL DENSITY AND ITS RELATIONSHIP TO THE EXPRESSION OF HEPATOCYTE GROWTH FACTOR AND ITS RECEPTOR C-MET IN BREAST CARCINOMA** 15
Jianqiang Zhao, Jie Liu, Shuping Liu, Nan Zhang, Yuping Sun

0832-1927487 **EFFECT OF 500 HZ STIMULUS PHASE REVERSAL ON THE 20-40 HZ FREQUENCY COMPONENT OF THE AEP.** 19
Sami Azam, Travis Brown, Mirjam Jonkman and Friso De Boer

0833-1930369 **EFFECT OF GRADIENT COMPRESSION TIGHTS ON MUSCLE ACTIVITY DURING CONTINUOUS JUMPING** 23
Xiaowen Zhao, Aming Lu, Guodong Wang, Xiaoqun Dai

0834-1942203 **MODELLING OF MICROPARTICLE TRANSPORT AND DEPOSITION IN RESPIRATORY AIRWAY VIA NASAL INHALATION** 27
Kiao Inthavong, Qinjiang Ge, Jiyuan Tu

0835-1933921 **NOISE FILTERING OF PHYSIOLOGICAL SIGNALS USING WAVELET ANALYSIS** 31
Jeffrey Lam,Dr. C. Susan Y. Vasana

0836-1904279 **ESTABLISHING A LINEAR BASIS FOR QUANTIFYING MATERIAL COMPOSITION USING SPECTRAL COMPUTED TOMOGRAPHY** 35
R. Zainon and P. H. Butler,J. P. Ronaldson and A. P. Butler，
A. P. Butler and P. H. Butler

0837-1914129 **PREPARATION, AND CHARACTERIZATION OF A HUMAN SINGLECHAIN FV ANTIBODY FRAGMENT FUSED WITH FC OF IGG1 AGAINST RABIES ANTIGEN IN PICHIA PATORIS** 39
Dingding Wang, Yan Sun, Shulin Huang,Manman Su, Weiqun Yan

0838-1955613 **SPATIAL IMAGING OF THE HUMAN TYMPANIC MEMBRANE** 45

Jen-Fang Yu,Chia-Lun Fan

0839-2001907 **STUDY URINARY METABONOMICS OF STOMACH CANCER PATIENT BY RAPID RESOLUTION LIQUID CHROMATOGRAPHY/TIME-OF-FLIGHT MASS SPECTROMETRY AND MASS PROFILER PROFESSIONAL** **49**
JIANG Yang,GAO Yufei

0840-1924153 **A HUMAN BRACHIAL ARTERY SYSTEM PROTOTYPE CONTROLLER FINE TUNING (DYNAMIC MODEL)** **53**
Nenad Popovich,Shahariar Kabir

0841-1913901 **FAST RESONANT SCANNING CONFOCAL MICROSCOPE APPLIED TO BIOLOGICAL SAMPLES** **59**
Yong Wu, Pedro Felipe Gardeazábal Rodríguez, Hui Zhao, Enrico Stefani

0842-1933425 **A DETACHABLE ENDOSCOPE BASED ON CAPSULE ENDOSCOPE FOR GI EXAMINATION** **63**
Lan-Rong Dung, Tang-Hsuan Hong, Chang-Min Huang and Yin-Yi Wu

0843-1920959 **ALTERANTIONS IN VISCOELASTIC MATERIAL PROPERTIES OF THE SCLERAL FIBROBLASTS IN NORMAL AND EXPERIMENTAL MYOPIA** **67**
Zhang Quanyou，Li yangyang

0844-1937261 **WHOLE-BODY CT/MRA IMAGE FUSION USING MULTI P-TILE METHOD FOR CONFIRMATION OF VISCOUS FLUID REGISTRATION** **70**
Soichiro Tokuhisa，Kunihiko Kaneko

0845-1969843 **DYNAMIC MECHANICAL BEHAVIOR OF CHITOSAN SPONGE SCAFFOLDS IN UNCONFINED COMPRESSION** **74**
Li Ruixin, Li Hui, Guo Yong, Shi Caihong, Hao Qingxin, Liu Lu, Li Zhihong, Guan Jing, Zhang Xizheng

0846-1898675 **RHO KINASE INHIBITORS INDUCE NEURITE OUTGROWTH IN PC12 ADH CELL LINE RATHER THAN IN PC12 CELL LINE** **78**
Weigang Duan, Luyong Zhang

0847-1918833 **ASCORBATE-GLUTATHIONE CYCLING IN TRIFOLIUM REPENS L.** **81**
Zhao Ji-Qiang,Li Li-Xia, Wang Chang-Quan

0848-1916653 **THE EFFECT OF PPAR AGONISTS (HS00098) ON SERUM LIPID PROFILES IN DIET-INDUCED OBESE RHESUS MONKEYS** **85**
Luo Qi-Hui, Zeng Wen, Chen Zheng-Li, Cheng An-Chun, Wang Ming-Shu, Shen Yu-Bo Zhu Chun-Mei, Bi Feng-Jun

0849-1905121 **OPTIMIZING CULTURAL CONDITIONS FOR VALEPOTRIATE PRODUCTION FROM UNTRANSFORMED ROOT OF VALERIANA AMURENSIS SMIR. EX KOM. BY RESPONSE SURFACE METHODOLOGY** **93**
Lei Cui,Xiu-hua Zhou,Zhen-Yu Wang

0850-1898901 **REGISTRATION OF INTRACORONARY ULTRASOUND IMAGES** **98**
Sun Zheng,Liu Bingru

0851-1914905 **PRIMARY IDENTIFICATION AND CHARACTERISTICS OF HIGH SUCCINIC ACID PRODUCING MOLD STRAIN SH-24** **102**
Jian Lin, Ying Sun, Xiaoyan Liu,Shiai Xu

0852-1901853 **STUDY ON IMAGE SENSOR CONTROLLING CIRCUIT FOR WIRELESS ENDOSCOPIC MEMS** **106**
Yingjun Chen, Ping Huang

0853-1909107 **EVALUATION OF ANTIDEPRESSANT ACTIVITY OF A NEW FLAVANONES DERIVATIVES OF GUAN-1101** **110**
Hong-Mei Zhang, Pan Lin, Yin-Feng Xu, Li-Ping Guan

0854-1924793 **VARIATION OF CU, ZN, FE, K, AND MG CONTENTS IN TARTARY BUCKWHEAT SEEDS** **113**
Xiao-Yan Huang, Kai-Feng Huang and Qing-Fu CHEN

0855-1931275 **A STRATEGY FOR BOTH QUALIFICATION AND QUANTITATION OF PROTEIN BASED ON QUADRUPOLE-TIME OF FLIGHT TANDEM MASS SPECTROMETRY** **120**
Shanshan Wang, Rusong Zhao , Jian hua Liu , Jin Zhao

0856-2002045 **OPTIMIZATION OF CULTURE MEDIA AND ITS IDENTIFICATION OF 0288 TRICHOLOMA MATSUTAKE** **124**
ZHENG Shang-Yong，JIANG Zhong-Hai

0857-1900951 **SYNTHESIS OF (S)-3-HYDROXYL ETHYL BUTYRATE BY ASYMMETRIC REDUCTION OF ETHYL ACETOACETATE WITH CANDIDA PSEUDOTROPICALIS 104 IN AQUEOUS/ORGANIC SOLVENT BIPHASIC SYSTEM** **128**
Zhimin Ou, Qingmei Chen, Qinying Yan

0858-1948639 **SMART ROBOTIC DRILL FOR COCHLEAR IMPLANTATION** **132**
Du X , Zoka Assadi M , Brett PN , Capcelea E , Dalton J, Proops DW , Coulson CJ , Reid AP

0859-1934557 **CONSTRUCTION OF A CHIMERIC PORCINE CIRCOVIRUS (PCV1-2) FROM CHINA STRAIN** **136**
Junling XIE, Xiaoxue SHAO, Shuanghai ZHOU, Duoliang RAN

0860-1908075 **A SIMPLIFIED COMPUTER MODEL OF CARDIOVASCULAR SYSTEM WITH A ARM BRANCH** **140**
Guo Tao, Song Jia,Yu Mengsun

0861-1925875 **DESIGN AND APPLICATION OF SOFTWARE FOR GENERATING SIMULATED SIGNAL DATA** **143**
Longcong Chen,Bin Gao,Ping Chen,Shixiong Deng,Xingliang Xiong,Gaiqin Liu

0862-1920951 **COMPARATION FOR THE IMPORTMENT CHEMICALS FROM TWO MEDICAL FUNGUS IN CHINA** **147**
Xie Fang,Li Jianhong

0863-1955597 **THE HEAD SHADOW PHENOMENON AFFECTED BY SOUND SOURCE: IN VITRO MEASUREMENT** **149**
Jen-Fang Yu,Yen-Sheng Chen

0864-1955601 **THE NON-INVASIVE MEASUREMENT OF GEOMETRY OF HUMAN OSSICLES** **153**
Jen-Fang Yu,Chia-Lun Fan

0865-1955543 **THE DYNAMIC CHARACTERISTIC OF IN-VIVO HUMAN OSSICLES** **156**
Jen-Fang Yu，Ching-I Chen

0866-1904113 **THE VIBRATION ANALYSIS OF BONE CONDUCTION FOR BONE ANCHORED HEARING AIDS: IN-VIVO HUMAN MASTOID** **160**
Jen-Fang Yu,Ching-I Chen

0867-1934459 **DESYNCHRONIZATION OF ALPHA-BAND RHYTHM RELATED TO RETRIEVING SHORT-TERM MEMORY** **165**
Takuya Momiki,Yoshimi Nakazono,Koichi Yokosawa,Makoto Takahashi,Masashi Sata,Shinya Kuriki

0868-1906061 **SEMG FEATURE ANALYSIS - BASED ON PERMUTATION ENTROPY** **169**
Yuan Ming，Luo Zhi-zeng

0869-1921545 **ENZYMATIC SACCHARIFICATION OF IONIC LIQUID-PRETREATED SUGARCANE BAGASSE** **173**
Zhao-Mei Wang, Kai-Jun Xiao, Bi-Sheng Zheng

0870-1906089 **OGWE ALGORITHM AND ITS APPLICATION ON SEMG** **177**
Yang Xin-liang ,Luo Zhi-zeng

0871-1925221 **HIGH PERFORMANCE LIQUD CHROMATOGRAPHIC ANALYSIS OF DEGRADATION PRODUCTS OF TINIDAZOLE PILLS** **181**
Xia Ting，liu Xiaoyu,Zhang Yao,Li Qingshan,Teng Lirong

0872-1918273 **STUDY OF RAPID ENDOTOXIN DETECTION BASED ON INTERDIGITAL GOLD ELECTRODE AND SAW SENSOR** **184**
YANG Xiaohe, CHEN Xianming, SHEN Xiaojun,YANG Hao

0873-1908107 **IDENTIFICATION OF TWO CTL EPITOPES DERIVED FROM FOOT-AND-MOUTH DISEASE VIRUS** **187**
Feng-Shan Gao, De Zhao, Cui Qiao,Qiang Zhang

0874-1912587 **FABRICATION AND MODELING OF ULTRASENSITIVE LABEL FREE IMPEDIMETRICMMUNOSENSORFORIGG BASEDON POLY(OPHENYLENEDIAMINE) FILM MODIFIED GOLD ELECTRODE** **191**
Minghao Wang,Lixin Cao, Peisheng Yan, Ningning Wu

0875-1905651 **INTACT PLANTLET FORMATION BY ONE-STEP TISSUE CULTURE OF A MEDICINAL PLANT DIONAEA MUSCIPULA** **195**
Zheng-li Du, Yue-sheng Yang, Hong Wu,Gui-zhao Zheng, Chun-man Chen

0876-1906579 **THE RESEARCH OF EEG PROCESSING METHOD BASED ON WAVELET DE-NOISING AND BLIND SOURCE** **199**
XU Bin, LUO Zhi-zeng

0877-1903821 **ANALYSIS OF VASCULAR SOFT TISSUE DIVISION WITH LAPAROSCOPIC SCISSORS** **203**
L.F.Xiong, T.Yang, C.K.Chui, C.L.Teo, W.M.Huang, J.Liu, Y Su and S Chang

0878-1919005 **PROCESSING OPTIMIZATION FOR ORGANOLEPTIC QUALITY OF CHINESE LOW-FAT PORK MEATBALL** **208**
Hao Dong, Kai-jun Xiao, Cong-gui Chen

0879-1925885 **DEVELOPMENT OF DIGITAL-CONTROLLED MEASURING INSTRUMENT FOR HEARING** **212**
Longcong Chen,Bin Gao,Ping Chen,Xingliang Xiong,Gaiqin Liu

0880-1934241 **COMPARISON OF DOSE DISTRIBUTION BY RING AND FLETCHER APPLICATORS DURING HIGH DOSE RATE BRACHYTHERAPY IN CERVICAL CANCER: A STUDY FROM A RURAL CENTER OF PUNJAB, PAKISTAN** **216**
Muhammad Hammad Aziz, Muhammad Nadeem, Afifa Sarwar, Muhammad Afzal

0881-1961843 **BRAIN DEFORMATION MODEL FOR NEUROSURGICAL SIMULATION GPU-BASED MODEL FOR VOLUME-PRESERVING DEFORMATION** **220**
Roy Eagleson and Terry Moschandreou,Sandrine de Ribaupierre

0882-1922025 **A REVIEW OF ARTICULAR CARTILAGE PROTEOGLYCAN ASSESSMENT USING MAGNETIC RESONANCE IMAGING** **224**
Xu Dai , Janet L. Ronsky

0883-1929167 **MRP PRIOR: AN EVALUATION STUDY** **228**
E. Karali and D. Koutsouris

0884-1933849 **KINEMATIC MODELING AND ANALYSIS OF A PARAPLEGIC SWING THROUGH CRUTCH AMBULLATION** **232**
Sara Zohoor,Farzam Farahmand

0885-1899947 **BACTERIAL STERILIZATION BY THE HOMEMADE THREE-DIMENSIONAL DBD AT ATMOSPHERIC PRESSURE** **236**
Ming-Chen Wang,Shu-Hao Cheng,Chieh-Fu Wang,Kuen Ting

0886-1932795 **EFFECT OF ELASTIC BANDAGES ON MUSCLE STRENGTH AND ELECTROMYOGRAPHY ACTIVITY** **240**
Yuheng Zhang, Xiaoqun Dai, Hanchu Miao, Fanfan Liu

0887-1905363 **VIRTUAL NEEDLE INSERTION SIMULATION BASED ON MASS-SPRING MODEL** **244**
Min Xiao-ping, Ju ying,Bai Peng-gang, Chen Chuan-ben

0888-1898549 **SYNTHESIS OF TERT-BUTYL (3R, 5S)-6-CHLORO-3,5-DIHYDROXYHEXANOATE BY ASYMMETRIC REDUCTION OF TERT-BUTYL (S)-6-CHLORO-5-HYDROXY-3-OXO-HEXANOATE WITH YEAST CELLS** *Zhimin Ou, Zhihong Sui, Qinying Yan* **247**

0889-1898461 **OPTIMIZATION OF ARCTIIN BIOTRANSFORMATION CONDITION BY RESPONSE SURFACE METHODOLOGY** *Zhimin Ou,Hanbing Shi,Sun Xingyuan* **251**

0890-1901145 **EFFECTS OF CULTURE PASSAGE, SERUM STARVATION AND STARVATION PERIOD ON G0/G1 PHASE AND APOPTOSIS OF IN VITRO CULTURED BOVINE OVIDUCT EPITHELIA CELLS** *Gao Guo-long, Zhang Min, Li Si-qiang, Wang Hai-yan* **254**

0891-1912847 **SIMULTANEOUS DETERMINATION OF HARPAGOSIDE AND ITSETABOLITES HARPAGOSIDEMETABOLINE Ⅰ,HARPAGOSIDEMETABOLINE Ⅱ AND AUCUBININE B IN CULTURE OF ASPERGILLUS NIGER BY SPE-HPLC** *Jun Chang，Zhou Bin* **259**

0892-1929271 **THE EFFECT OF ELLAGIC ACID ON PHOTODYNAMIC THERAPY INDUCED CYTOTOXICITY IN K562 LEUKEMIA CELLS** *Dan Sun, Su-juan Zhang, Jin-Bo Hao, Li qianglong, Xiao Liu, Ling-fang Yin* **265**

0893-1907869 **GYRO-EFFECT AND EARNSHAW’S THEOREM：STABLE AND UNSTABLE EQUILIBRIUM FOR ROTARY AND STATIONARY PERMANENT MAGNETIC LEVITATORS** *Kunxi Qian* **269**

0894-1898701 **MODELING AND SIMUALTION OF SYSTEMIC CIRCULATION** *Kunxi Qian, Lingling Liu，Lan Li* **272**

0895-1898763 **CONNECTING CONDUIT-FREE AND BYPASS CIRCUIT-LESS MINI LVADS ELIMINATE THE MOST LIKELY SITES OF THROMBOSIS** *Kunxi Qian, Lingling Liu* **276**

0896-1916785 **IN VITRO COMPOUND CULTURE OF HUMAN-LIKE COLLAGEN/NANO-HYDROXYAPATITE POROUS SCAFFOLDS AND CARTILAGE CELLS** *Liping Jia,Zhiguang Duan,Daidi Fan,Yu Mi* **279**

0897-1937513 **A HOME BASED AID FOR ELEDERLY AND PHYSICALLY CHALLENGED WITH EMBEDDED INTEL-BOT** *Sudharsan.A,Parthiban.K* **283**

0898-1913991 **SCREENING OF MARINE ACTINOMYCETES AND ITS BIOACTIVE METABOLITES AGAINST AFLATOXIN PRODUCTION** *Yan Pei-Sheng, Shi Cui-Juan, Wang Kai, Wang Quan-Fu* **287**

0899-1919369 **EFFECTS OF IMPLANTABLE TRANSDUCER CONNECTION ON MIDDLE EAR RESPONSES** **290**
Xuelin Wang,Liling Wang

0900-1914043 **INHIBITORY ACTIVITY OF EXTRACTS FROM MYCELIA OF SEVERAL MEDICINAL MUSHROOMS ON THE ANGIOTENSIN I-CONVERTING ENZYME** **294**
GAO Xiu-Jun, YAN Pei-Sheng, Wang Yuan-Yuan

0901-1914061 **EFFECTSOFDIFFERENTFERMENTATIONMEDIA ON POLYSACCHARIDES PRODUCTION AND ANTITUMOR AND ANTIOXIDANT ACTIVITY** **298**
Dong Jing, Yan Pei-Sheng, Zhu Guo-Zhen, Gao Xiu-Jun

0902-1918739 **NONLINEAR IDENTIFICATION OF EPILEPTIFORM SIGNALS BASED ON ARTIFICIAL RECURRENT NEURAL NETWORKS TRAINED WITH THE CUBATURE KALMAN FILTER** **301**
Armando López-Cuevas,Laura Medina-Ceja,Bemardino Castillo-Toledo,Consuelo Ventura-Mejia

0903-1929367 **PREPARATION OF N,O-CARBOXYMETHYL CHITOSAN -COATED CALCIUM ALGINATE MICROPARTICLES AND APPLICATION IN BIFIDOBACTERIUM LONGUM BIOMA 5920** **305**
Ran Su,Xiaoli Zhu,Daidi Fan,Yu Mi

0904-1916051 **SYNTHESIS AND CHARACTERIZATION OF A NEW CARBOXYMETHYL CHITOSAN/HUMAN-LIKE COLLAGEN HYDROGEL** **308**
Lijun Zhang,Xiaoxuan Ma,Daidi Fan,Chenhui Zhu

0905-1914775 **ACTNET: ACTIVE CONTENT MANAGEMENT FOR PERSONALIZED MEDICINE** **312**
Wei Xing, Moustafa Ghanem, Claus Jorgensen, Chris Bakal, Andrew Thompson

0906-1919001 **PURIFICATION AND CHARACTERISTICS OF A NOVEL OPIOID PEPTIDE DERIVED FROM CASEIN BOVINE MILK SODIUM** **318**
Lei Wu,Guang-chang Pang, Yunxia Ren

0907-1908017 **APPLICATION OF SUB-CRITICAL WATER EXTRACTION IN PHARMACEUTICAL INDUSTRY** **322**
Xiao-xia Liang,Qiao-jia Fan

0908-1903807 **SYNTHESIS, STRUCTURE, CYTOTOXIC ACTIVITY AND DNABINDING PROPERTIES OF NOVEL TETRANUCLEAR COPPER(II) COMPLEX BRIDGED BY DISSYMMETRICAL N-BENZOATO-N′ - (3-N,N’ -DIMETHYLAMINOPROPYL)OXAMIDE** **326**
Fahui Li, Lintong Wang, Yinmin Feng, Jun Lin

0909-1905795 **SURFACE MODIFICATION OF POLYCARBONATEURETHANE BY COVALENT LINKAGE OF HEPARIN WITH A PEG SPACER** **330**
Mingqi Tan, Yakai Feng,Pengfei Zhang, Haiyang Zhao

0910-1905029 **NERVE GROWTH FACTOR EXPRESSION IN ASTROCYTOMA AND CEREBROSPINAL FLUID: A NEW BIOMARKER FOR PROGNOSIS,SURVEILLANCE AND TREATMENT OF ASTROCYTOMA** **334**
FENG Yun, YANG Yong, ZHANG Zhi-jian, GONG Ai-hua

0911-1898481 **GENE EXPRESSION INVESTIGATION FOR PRISTINAMYCIN YIELD ENHANCEMENT IN STREPTOMYCES PRISTINAESPIRALIS** **338**
Qingchao Jin, Zhihua Jin,Bo Xu，Shanjing Yao,Fuyong Li

0912-1901199 **SIMULATION OF SURFACE IMMOBILIZATION ON MICROELECTRODE ARRAY FOR BIO-IMPEDANCE MEASUREMENT** **343**
Y. Xu, M-E. Xu,L-J Qian

0913-1935943 **DESIGN AND IMPROVEMENT ON A STRESS LOADING DEVICE FOR LIGAMENT TISSURE ENGINEERING** **348**
Xiude Wu,Jian Hua

0914-1900465 **A NOVEL METHOD FOR FEATURE EXTRACTION OF CRACKLES IN LUNG SOUND** **352**
Li Zhenzhen , Wu Xiaoming,Du Minghui

0915-1917321 **A PRELIMINARY STUDY OF BIODEGRADABLE INFERIOR VENA CAVA FILTER** **355**
Wang Xiaoping, Feng Hao, Pan Haipeng,Xiao Yueyong

0916-1917635 **FINITE ELEMENT ANALYSIS OF CORALLINE BONE GRAFT** **359**
Wang Xiaoping, Feng Hao, Pan Haipeng,Mao Keya

0917-1918533 **MEASUREMENT OF THE STRENGTH OF VISUAL ILLUSION** **361**
Medvedev L.N., Fedorova E.S., Dubrovina R.H.,Kochneva K.S., Kozhuhovskaya E.S.,Shoshina I.I.

0918-1927969 **THE FEASIBILITY FOR THE RETRIEVE OF A VECTOR BASED ON A BACTERIAL ARTIFICIAL CHROMOSOME AFTER A LARGE DELETION BY RECOMBINEERING** **364**
Zhengyuan Yu, Jianhong Lu, Haibo Yu, Qijia Yan, Lielian Zuo, Guiyuan Li

0919-1938193 **FMRI PARADIGM TO PREDICT HUMAN BRAIN ACTIVITY** **368**
Ing. MSc.Octavio J. Salcedo Parra, Ing. Msc. Cristyan Manta, Dr.Gustavo López Rubio

0920-1903903 **SYNTHESIS, CHARACTERIZATION AND CYTOTOXIC ACTIVITY OF A NOVEL 2D NETWORK TRIORGANOTIN(IV) POLYMER CONTAINING TWO TYPES OF MACROCYCLES** **372**
Fahui Li

0921-1898635 **GRADIENT DELAY CORRECTION FOR FSE-MRI*** **376**
Ruipeng Ning,Guang Yang,Gengying Li

0922-1938409 **SYSTEMATIC EVALUATION MODEL OF CHINESE MEDICAL PLANTS BASE ON MAXIMUM LIKELIHOOD RADICALS** **379**

Zhang gang, , chao hui, hang heping,sheng jinghui, liu bai ning,Zhang gang ,wu shui cai

0923-2003073 **EFFECT OF 4'-METHERY-SCUTELLAREIN ON C-MYC EXPRESSION IN HUMAN CHORIOCARCINOMA JAR CELL** **383**
YANG Zui-Su, FENG Bo, HuANG Fang- Fang ,Gong Jian-Fang, XU Chang-Fen

0924-1955833 **THE CONTROL OF ACETATE FOR ESCHERICHIA COLI EXPRESSING HUMAN-LIKE COLLAGEN IN FED-BATCH CULTURE** **387**
Ru Xu,Yane Luo,Daidi Fan,Lei Guo

0925-1912809 **OPTIMIZATION OF A CULTIVATION PROCESS FOR THE HUMAN GROWTHHORMONEBIOSYNTHESISBYRECOMBINANT ESCHERICHIA COLI** **391**
Longan Shang, Yan-Hui Zhang, Fei-Fei Wu,Dai-Di Fan

0926-1929601 **ANALYTICAL PROTEIN MONITORING BY USING ULTRASONIC WAVES** **394**
S. Holz,P. Lindner,M. Stanke,S. Beutel,M. Hartlep,B. Hitzmann,J. Peters,T. Scheper,R. Winter

0927-1936331 **DIRECT SCREENING OF POTENTIAL POLYHYDROXYALKANOATES (PHAS) BACTERIAL FROM SOIL ENVIRONMENT USING SWEET SORGHUM AS A SOLE CARBON SOURCE** **397**
Varavut Tanamool,Pakawadee Kaewkannetra

0928-1943039 **CONSTITUTIVE EQUATION FOR PASSIVE MYOCARDIUM** **401**
MHBM Shariff and A. Bentiba

0929-1930621 **INSTABILITY OF A CANTILEVER PLATE IN OBSTRUCTED CHANNEL FLOW** **405**
M. R. Rasani, K. Inthavong and J. Y. Tu

0930-1980451 **RAW GINGER COMPOSITE ANTIOXIDANT WITH HIGH EFFICIENCY TO EXTRACT VITAMIN C FROM STRAWBERRY** **409**
GUO Yanhua, ZHANG Yumin，MA Tao，LUO Dabing

0931- 1990975 **CELL SIZE STATISTICS ON GRANULAR ANALYSIS** **413**
Lu Zheng， Li Yan，Duan Shan

0932-1922281 **CONVERSION OF BULK MALAYSIAN SEASHELLS TO BULK HYDROXYAPATITE FOR HUMAN BONE IMPLANT** **417**
Nur Farahiyah Mohammad, Norsima Nazirah Sidek, Md Azman Seeni Mohamed , Zulkarnay Zakaria, and Intan Shafinaz Mohammad

0933-1940427 **STUDY OF THE BIOACTIVITIES OF FIVE CHLOROPHYLLS BASED ON DENSITY-FUNCTIONAL THEORY** **421**
Zhan Min,Li Zhenghua, Zhang Yunhuai

0934-1952521 **DEVELOPMENT OF ARM DEVICE TO INVESTIGATE THE ELBOW JOINT MOTION** **425**
M.S. Salim, N.M. Khair, S. Yahya, M.F. Mahmud

0935-1930443 **EFFECT OF NORMAL AND SHEAR LOAD ON SKIN BLOOD FLOW** **429**
Yanan Huang, Xiaoqun Dai, Rong Jin ,Guannan Fang,Xiaowen Zhao

0936-1906205 **MULTIPLE PIPELINES FOR MASS SPECTROMETRY DATA PROCESSING** **432**
Qing-Wei XU

0937-1897971 **THE CRANIO-CERVICAL LYMPHATIC RETURN: THE CHANNEL OF INTRA-EXTRACRANIAL MACROMOLECULE TRANSPORT** **435**
Yufei Gao,Yang Jiang

0938-1913113 **NEW RESEARCH ON MEDICAL CT IMAGING TECHNOLOGY BASED ON CS THEORY** **440**
Liu Dun

0939-1929303 **EVALUATION OF RIF-RESISTANCE AS THE SCREENING INDICATOR FOR MULTI-DRUG RESISTANT TUBERCULOSIS** **444**
Ling-fang Yin, Hui-ping Sun , Dan Sun, Su-juan Zhang, Li-xin Shen

0940-1902119 **REVIEW OF RESEARCH PROGRESS IN BIOROBOT** **447**
Hui Wang, Ruituo Huai,Junqing Yang,Xuecheng Su

0941-1917553 **EXPERIMENTAL STUDY OF THERMAL DEPOLARIZATION OF DIFFERENT CUT-DIRECTION ND:YAG CRYSTALS** **451**
Menghua Jiang, Zhe Sun, Xiang Zhang, Hong Lei, Qiang Li

0942-1920507 **IMMUNE EFFICACY OF GENOMIC EXPRESSION LIBRARY FROM AVIAN PASTEUELLA MULTOCIDA IN MICE** **455**
GONG Qiang, CHENG Ming, Niu Ming-fu

0943-1928939 **AN IMPROVED APPROACH TO SUPER RESOLUTION BASED ON PET IMAGING** **459**
Huang Hui,Yan Peimin

0944-1917931 **HIGH AVERAGE POWER FOUR RODS PULSED ND:YAG LASER** **463**
Menghua Jiang, Weirong Guo, Yongling Hui,Jinguo Wang,Hong Lei, Qiang Li

0945-1934937 **CONSTRUCTION AND COMPARISON OF THREE KINDS OF INFECTIOUS DNA CLONES OF PORCINE CIRCOVIRUS TYPE 2** **467**
Junling XIE, Shuanghai ZHOU

0946-1931349 **PREDICTION OF SUITABLE MATERIAL PROPERTIES FOR LUMBAR ARTIFICIAL DISC USING FINITE ELEMENT METHOD** **471**
Azadeh Ghouchani,Hamid Reza Katouzian,Mohammad Ravari

0947-1933341 **EEG-BASED PERSON IDENTIFICATION BY USING WAVELET AND SVM** **475**
Zhifang Pan,Hongbin Yu,Hongtao Lu

0948-1952529 **CONTINUOUS BLOOD PRESSURE MEASUREMENT USING NEURAL NETWORK MODEL** **479**
M. K. Ali Hassan, M.Y. Mashor, A.R. Mohd Saad, M.S. Mohamed

0949-1921805 **CYTOTOXICITY AND CELL CYCLE OF KAPPA-SELENOCARRAGEENAN COMBINED WITH PACLITAXEL ON HUMAN BREAST CARCINOMA MCF-7 CELLS** **483**
Ling Na, Chen Chunying, Ling Jianjun, Xu Yanyan, Ji Yubin

0950-1907283 **BIOCOMPATIBILITY OF HYDROPHILIZED CHITOSAN-GELATIN POROUS SCAFFOLDS BY PLASMA POLYMERIZATION** **486**
K. Lee, B. H. Kim,S. C. Jung

0951-1925881 **DEVELOPMENT OF A DOUBLE-CHANNEL MEDICAL SIGNAL GENERATOR BASED ON STM32 WITH HIGH PERFORMANCE** **490**
Longcong Chen,Bin Gao,Ping Chen,Xingliang Xiong,Gaiqin Liu

0952-1909065 **EXPERIMENTAL STUDY OF THERMAL EFFECT ON LARGE SIZE SIDE PUMPED ND:YAG THIN DISK LASER** **494**
Feng Chi，Guo Weirong，Yan Lelun，Li Qiang

0953-1934505 **OPTIMIZATION OF MEDIUM FOR HEAT-STABLE ANTIFUNGAL FACTOR (HSAF) PRODUTION BY LYSOBACTER ENZYMOGENES STRAIN C3 USING RESPONSE SURFACE METHODOLOGY** **498**
TIAN Nan, ZHAO Lin, LIU Xin-li

0954-1934481 **STUDIES ON THE ADSORPTION OF EPOTHILONES WITH DIFFERENT KINDS OF RESINS** **503**
WANG Ting, ZHAO Lin, GAO Haiyan, LIU Xinli,LI Pengfei, LI Yuezhong

0955-1952507 **FAST VIRTUAL STENT-GRAFT DEPLOYMENT WITH DEFORMABLE MESHES: APPLICATION TO AORTIC DISSECTION** **507**
Duanduan Chen, Hanjun Li, Yuhua Peng,Kateryna Spranger, Yiannis Ventikos

0956-1960033 **IMPLEMENTING ISO 17025 IN DEVELOPING COUNTRIES: PROBLEMS AND CHALLENGES** **511**
Mona Moradi

0957-1956727 **USE OF ARTIFICIAL NEURAL NETWORKS AND ELECTROENCEPHALOGRAPHY TO PREDICT EPILEPTIC SEIZURE** **516**
Alireza Givehchi

0958-1981175 **DETECTION OF CARBOFURAN BASED ON CARBON NANOTUBES MODIFIED BIOSENSORS** **525**
Meng-Fei Wang，Jie Ma ,Shu-Ping Zhang, Kexi Ren

0959-1927799 **STUDY OF THE CORRELATION BETWEEN U1TRASONIC ATTENUATION COEFFICIENT AND TEMPERATURE** **529**
Liu Zhenlin, Yang Chunlan, Sheng Lei, Wu Shuicai

0960-1993255 **THE ANTIDRUG TENDENCY AND ENVIRONMENTAL DEPENDENCE OF BACTERIAL STRAIN IN SPUTUM SAMPLE OF LOWER RESPIRATORY TRACT INFECTION** **532**
XU Nianhui

0961-1981171 **ISCHEMIA DETECTION VIA DYNAMIC TIME WARPING AND FUZZY RULES** **536**
Eiman Farahabadi，Eiman Farahabadi，Hossein Rabbani，Mohammad Parsa Mahjoub，Alireza Mehri Dehnavi

0962-1945543 **EFFECTS OF HUMAN GAIT ON AIR DISTRIBUTION IN CONTAGIOUS ISOLATION TENT WARDS** **540**
Wei Gaofeng, Tian Feng, Sun Qiuming, Xie xinwu,Ni ai'juan

PART02

0964-1901827 **FEASIBILITY OF SMALL-PARTICLE COMPOSTING OF MUNICIPAL SOLID WASTE** **543**
Chun-ping LI, Guo-xue LI, Li-mei，REN, Xin-xia ZHU and Hong-yu ZHANG

0965-1903127 **CONSEQUENCES OF VARIATION OF PARTICLES SIZE ON ANAEROBIC DIGESTION AND BIOGAS PRODUCTION IN PIG FARMING SLURRIES** **549**
Lomas J.

0966-2011809 **PHOTOVOLTAIC PARAMETERS OF AG/SNO2:AL/NSI/AU CHEMICALLY SPRAYED DEVICE** **554**
Benouis C.E.;Benhaliliba M.

0967-1899819 **INFLUENCE OF ORGANIC LOAD ON THE CHARACTERISTICS OF PHOSPHOROUS RELEASE AND ABSORPTION IN ADVANCED HA-A/A-MCO SLUDGE REDUCTION PROCESS** **557**
ZUO Ning，JI Fang-ying

0968-1898599 **INFLUENCE OF INITIAL PHOSPHATE CONCENTRATION AND PH ON REACTANTS MOLAR RATIO OF MAGNESIUM AMMONIUM PHOSPHATE (MAP) CRYSTALLIZATION** **561**
Jing Ma, Liping Qiu，Shoubin Zhang , Xuedong Zhai

0969-1929859 **A COMPARISON OF PLANKTON DYNAMICS IN THE UPPER MIXED LAYERS OF ARABIAN SEA AND BAY OF BENGAL: A MODEL SENSITIVITY ANALYSIS** **565**
Girija Jayaraman，Raj Rani

0970-1905695 **THE EFFECT OF COMBINED ECOLOGICAL FLOATING BED FOR EUTROPHIC LAKE REMEDIATION** **569**
Liguo Zheng，Renbin Yang，Haiping Wang

0971-1918995 **REMOVAL OF 17B-ESTRADIOL BY NYLON FILTER MEMBRANE: ADSORPTION MECHANISM, PH EFFECT, TEMPERATURE INFLUENCE AND SPECTROFLUORIMETRIC ANALYSIS** **573**
Min Liu, Edward P.C. Lai，Yu Yang

0972-1913821 **ANALYSIS OF TOTAL SUSPENDED PARTICULATES POLLUTION ALONG SHANGHAI-NANJING EXPRESSWAY** **577**
YAO ZHAO，DI SHI

0973-1936111 **EXPERIMENTAL STUDY OF AMMONIA REMOVAL FROM WATER BY DIRECT CONTACT MEMBRANE DISTILLATION** **582**
Dan Qu,Jun Wang,Hongjie Wang

0974-1926925 **GC/MS ANALYSIS OF POLYBROMINATED DIPHENYL ETHERS IN VEGETABLES COLLECTED FROM SHANGHAI,CHINA** **586**
Zhen Li, Liwei Peng, Fei Gao, Weijun Kang, Minghong Wu

0975-1926947 **EFFECTS OF SLUDGE RETURN RATIOS AND INTERNAL RECYCLE RATIOS ON DENITRIFYING PHOSPHORUS REMOVAL PERFORMANCE IN THE MODIFIED UCT STEP FEED PROCESS** **590**
Xu Cao, Shuying Wang, Congcong Lu，Chuanxin Wang

0976-1924385 **EFFECT OF ELECTROKINETIC ON BIODEGRADATION OF BENZO[A]PYRENE（BAP）IN A CLAY SOIL WITH POLARITY REVERSAL** **594**
Diannan Huang,Tingting Li,Bo Wu，Fengmei Li, Jiangwei Zhang, Shuhai Guo

0977-1926483 **CATALYTIC GASIFICATION OF ACETIC ACID OVER THREE KINDS OF MODIFIED ORE** **598**
Shao-min Liu， Ming-qiang Chen， Jun Wang, Fan-fei Min, Ming-gong Chen, Zhong-lian Yang, Hua Wang, Qian-qian Sui

0978-1931773 **STUDY ON HIGH-RATE REMOVAL AMMONIA TECHNOLOGY IN A RECIRCULATION AQUACULTURE SYSTEM** **602**
Zhan Peirong, Liu Wei, Lu Ling

0979-1932957 **OPTIMIZED NUTRIENT REMOVAL IN WASTE WATER TREATMENT PLANTS：ACTIVATED RETURN SLUDGE PROCESS** **606**
Sille Bendix Larsen，Gert Petersen，Jes la Cour Jansen

0980-1901815 **GRAY CORRELATION ANALYSIS ON SEWAGE SLUDGE STABILIZATION BY ADDING SPRINKLE PROPORTIONS OF LIME** **610**
Chun-ping LI, Jian-guo JIANG, Min YIN and Jun GU

0981-1948701 **THE MECHANISM OF THE PHOTOCATALYTIC DEGRADATION OF OLEIC ACID ON EFFICIENT SELF-CLEANING SURFACES** **615**
Jiri Rathousky, Vit Kalousek, Jaromir Jirkovsky

0982-2002021 **ACTIVATED SLUDGE ACTIVATOR SCREENING USING THE BIOLOG MICRO-PLATE** **619**
ZHOU Sheng，WEI Chaohai，KE Lin

0983-1899893 **INFLUENCE OF SRT ON PHOSPHORUS REMOVAL AND SLUDGE CHARACTERISTICS IN HA-A/A-MCO SLUDGE REDUCTION PROCESS** **623**
ZUO Ning，JI Fang-ying

0984-1901419 **DERIVATION OF THE PREDICTED NO-EFFECT CONCENTRATIONS FOR THE 17B-ESTRADIOL (E2) AND 17A-ETHINYLESTRADIOL (EE2) IN AN AQUATIC ENVIRONMENT** **627**
Bing Li Lei，Qian Liu

0985-1898577 **STUDIES ON TREATMENT OF ASP FLOODING PRODUCED WATER BY HIGH-SPEED CENTRIFUGATION** **631**
Fu-jun XIA, Xiao-gang FAN, Xiang-nan SUI

0986-1897201 **A MULTI-OBJECTIVE MODEL FOR ASSIGN PORT RESCUE RESOURCES** **639**
WANG Zesheng，ZHU Zhonghua

0987-1898125 **REMOVAL OF CONTAMINATION FROM WASTEWATER USING ELECTROCOAGULATION METHOD** **644**
Dhorgham Skban Ibrahim, N. Sakthipriya，N. Balasubramanian

0988-1910083 **ECOLOGICAL RISK ASSESSMENT IN YANCHENG COASTAL WETLAND** **649**
Xi-Jun Ma，Bin Liu，Wei Ji

0989-1914171 **ORGANOPHOSPHORUS COMPOUNDS IN ROAD RUNOFF：SEDIMENTATION AND FILTRATION AS A MITIGATION STRATEGY** **653**
Sondre Meland，Roger Roseth

0990-1907815 **POLLUTION FLUXES FOR LAND-BASED CATCHMENT AREAS ENTERING THE JIAOZHOU BAY, CHINA** **657**
Hong-yan Han, Ke-qiang Li, Xiu-lin Wang, Guodong Qian, Xiao-yong Shi, Sheng-kang Liang，Jing Liu, Yan-ling Wang, Jin-bo Mu

0991-1914925 **ISOLATION AND IN-SITU BIOREMEDIATION OF THE OIL-DEGRADING HALOPHILE** **661**
Liu Xingwei，Liu Xianbin

0992-1912877 **QUANTITATIVE CALCULATION OF DISASTER INDEX AND DEGREE OF HARMFUL ALGAE BLOOMS** **665**
Tao Jiang, Min Cong, Mengmeng Tong, Tianjjiu Jiang，Mengmeng Tong

0993-1925593 **RELATIONSHIP BETWEEN BULKING SLUDGE AND SUBSTRATE TYPE UNDER AEROBIC CONDITIONS** **668**
Yang Xiong, Wang Shuying, Peng Yongzhen，Huo Mingxin，Guo Jianhua

0994-1940189 **INFLUENCE OF SMALL FOUR-WHEELED TRACTORS LOGGING ON FOREST SOIL RESPIRATION** **672**
Yang Deling , Wang Lihai

0995-1941807 **EVALUATION OF DOWNWARD CORRECTIONS OF GRAVITATIONAL FREE-AIR ANOMALIES TO EVALUATE GEOID IN COASTAL AREAS** **676**
Hongzhi Song，Alexey L Sadovski

0996-1925019 **SINGLE-PARTICLEANALYSIS IN AN INDOOR WORKING ENVIRONMENT IN VALENCIA, SPAIN** **679**
J. Llinares, C.Llinares, V. Moreno, M.C. Millán

0997-1926505 **DISTRIBUTION PROPERTIES OF PYROLYSIS PRODUCTS OF RICE HUSK BY MICROWAVE HEATING** **683**
Ming-qiang Chen, Peng Zhang, Jun Wang,Shao-min Liu, Fan-fei Min, Ming-gong Chen

0998-1899321 **DESCRIPTION OF LIFE HISTORY STRATEGIES OF S.MARIQUETER AND P.AUSTRALIS BY SEASONAL CHANGES OF CALORIC VALUE** **687**
He chiquan, Xu qiuyue, Meng zhaoshou , Zheng hong, Yang junna, Zhan yuewu,Lei yanru

0999-1925877 **PHOTOCATALYTIC ACTIVITY OF TIO2 IMMOBILIZED IN PERMEABLE GLASS MEMBRANE** **691**
Keyan Hu, Guoqiang Liu, Junsheng Liu ， Guoquan Shao

1000-1919199 **ENVIRONMENTAL MANAGEMENT USING DRAMA THEORY-CASE STUDY: CITARUM RIVER BASIN CONFLICT, WEST JAVA, INDONESIA** **694**
Pri Hermawan，Dini Turipanam Alamanda，Utomo Sarjono Putro，Dhanan Sarwo Utomo

1001-1904577 **STUDY ON EARLY WARNING SYSTEM OF GIS-BASED GEOLOGICAL HAZARD RISK** **698**
WanPing Wang，Liangxia Cheng，YongLing Zou

1002-1930847 **INVESTIGATION OF EMISSION FACTORS OF FLUORINATED GREENHOUSE GASES IN THE SEMICONDUCTOR INDUSTRIES** **702**
Shau-Chi Chiang，Jim Juimin Lin

1003-1919129 **REMOVAL OF NITRATE FROM GROUNDWATER USING THE TECHNOLOGY OF ELECTRODIALYSIS** **705**
Huizhen Xu，Changsheng Peng，Ahmed Abou-Shady，Jingjing Bi

1004-1979177 **DISTRIBUTION AND ADSORPTION OF PHOSPHORUS IN SIZE FRACTIONS OF PADDY SOILS WITH DIFFERENT FERTILIZATION HISTORIES** **709**
Zang Ling ,Tian Guangming

1005-1898547 **THE DETOXIFICATION OF TAILINGS SLURRY CONTAINING CYANIDE OF GOLD MINE** **713**
Zhang Tiezhi，Zhao Chengming，Chen Xi

1006-1908747 **PHOTOLYSIS OF CHLORODIFLUOROMETHANE (HCFC-22) WITH MICROWAVE DISCHARGE ELECTRODELESS MERCURY LAMP** **717**
S. C. Jung, Y. S. Bae, H. Lee，B. H. Kim，Y. I. Cho，S. G. Seo

1007-1922875 **TREATMENT OF LOW STRENGTH WASTEWATER AND SLUDGE CHARACTERISTICS IN AN ANAEROBIC BAFFLED REACTOR (ABR) AT ROOM TEMPERATURE** **721**
Zonglian She, Xiaohui Fu, Jian Wu, En Shi, Laili Zhao, Liang Guo

1008-1914173 **PILOT PLANT EXPERIMENT STUDY OF THE TREATMENT OF DYEING WASTEWATER BY PISTON-FLOW BIOREACTOR** **725**
Fu-Ji Wen, Jian-xiu Li，Hong-Bok Choi, Yan-Hao Yang, Burm-Shik Kim

1009-1901191 **STUDY ON IMPACT OF PENNISETUM HYDRIDUM HEDGEROW TECHNOLOGY IN SLOPE CROPLANDS ON SOIL CHEMICAL PROPERTIES** **729**

Wang Xiaolan，Su Chunjiang

1010-1921151 **HIGH-TEMPERATURE ADSORPTION OF CO2 FROM FUEL GAS BY FOUR MODIFIED CA-BASED SORBENTS** **734**
Lei Yang, Haowen Wang, Hongbing Yu， Shengqiang Wang， Jiangyao Yang

1011-1905527 **EFFECTS OF INTERNATIONAL TECHNOLOGY DIFFUSION AND ENERGY CONSUMPTION ON CO2 EMISSIONS IN CHINA** **738**
Rihui Lei, Yabin Zhang, Sichao Wei

1012-1904523 **DNAPL MASS FLUX STUDY WITH OXIDE MINERAL PRECIPITATION AT THE UP-GRADIENT DNAPL SOURCE ZONES** **742**
Huali Chen, Eungyu Park，Guoping Ding

1013-1917137 **SPATIAL VULNERABILITY ASSESSMENT FOR ROAD DEICING SALT ON SURFACE WATER USING GIS** **746**
Kjersti Wike，Stein Turtumøygard，Ståle Haaland,Nils-Otto Kitterød

1014-1921345 **LONG-TERM TRENDS OF WATER QUALITY IN UPSTREAM OF DALING RIVER IN CHINA** **750**
Huixiu Wu, Cuiling Jiang, Zhong Du

1015-1999009 **NUMERICAL SIMULATION OF INFLUENCE SCOPE OF OIL SPILLS IN THE SANSHA BAY** **754**
Huang Huiming, Wang Yigang, Zhu Yi

1016-1932759 **STUDY ON THE TREATMENT OF LANDFILL LEACHATE FROM ARB BY A COMBINED PROCESS OF OZONATION AND ACTIVATED SLUDGE** **758**
Zhengyang An, Xiaojun Xu, Haifeng Wang

1017-1935397 **MODEL DESIGN ON THE TREATMENT OF THE FLY ASH WEAK FOUNDATION** **762**
Zhang Jianwei,Zhu Minjie

1018-1936503 **EXPERIMENTAL STUDY ON THE PARTICLES CAPTURING OF FILTER MEDIA UNDER ELECTRIC FIELD** **766**
Zongbing Liu, Jingxian Liu, Ning Mao, Deqiang Chang, Xi Sun

1019-1933769 **OPTIMIZATION ANALYSIS OF AUTOMOTIVE REAR SPINDLE USING SHAPE OPTIMIZATION FOR PURPOSE OF WEIGHT REDUCTION** **770**
W.M. Wan Muhamad, Gunawan,E. Sujatmika, L. Mohd Fadzil

1020-1932159 **STUDY ON REMOVAL OF PHOSPHORUS IN RURAL DOMESTIC SEWAGE BY CONSTRUCTED INFILTRATION POND** **774**
Xu Bing,Pei Haiyan

1021-1950299 **DOES OPEN-PIT COAL MINING INCREASE THE NATURAL A ACTIVITY IN RESPIRABLE AEROSOLS?** **777**
Möllmann-Coers M., Kümmerle E., Pomplun E.,Klemp D.

1022-1939109 **SYNTHESIS OF A-MOO3 NANORODS AND THEIR APPLICATION FOR NO2 DETECTION** **781**

Bai Shouli, Luo Ruixian, Chen Chuan, Hu Jingwei,Li Dianqing, Chen Aifan

1023-1905319 **RUCL3-DCHA CATALYST SYSTEM: A SELECTIVE AEROBIC OXIDATION OF PRIMARY BENZYLIC ALCOHOLS UNDER MILD CONDITIONS** **785**
Ning Wang, Wen-Bing Qin，Qiong Chang, Wei-Yong Fan, Liang-Xian Liu

1024-1932947 **BIOELECTROCHEMICAL SYSTEM DEGRADATION OF AQUEOUS PHASE 1,4-DICHLOROBENZENE** **789**
Jianming Yu, Lusheng Xu, Qi Liu, Jiade Wang, Weidong Li

1025-1916473 **STUDY ON THE REGULARITY OF DUST DISSIPATION AND CONTROL TECHNIQUES IN SCREENING AND CRUSHING WORKSHOP** **792**
Huang Ying-pin,GE Shao-cheng,He Yuan

1027-1912131 **STRATEGIES TO REDUCE LATERAL FORCES ON HIGH-RISE BUILDINGS THAT USE DIAGRID STRUCTURAL SYSTEM** **795**
Binh K. Nguyen and Hasim Altan

1028-1934541 **MULTI-PARAMETER EXPERIMENTAL ADSORPTION EFFECT OF 239PU ON PHYLLITIC SLATE AND CLAY** **799**
Zhe Li, Xianguo Tuo,Mingzhe Liu, Yangchun Leng

1029-1913933 **ASSESSMENT OF THREE BACTERIAL STRAINS TO CONTROL POPULATION OF AFLATOXIN-PRODUCING FUNGUS IN SOILS** **804**
Yan Pei-Sheng· Xie Hai-tao · Shi Cui-juan · Xiao Wei

1030-1932137 **TECHNIQUES OF TWO-DIMENSIONAL FINITE ELEMENT MESH GENERATION FOR COMPLEX RIVERWAYS** **807**
Ma Li,Liu Xu

1031-1899709 **AIR POLLUTANT EMISSIONS FROM COAL-FIRED POWER PLANTS IN HENAN IN CENTRAL CHINA** **810**
Dongmei Li, Yang Guo, Xuefeng Dong, Pengguo Ding, Qiang Wang, Zhenqian Cao, Wenlong Wu

1032-1924317 **THE MATERIAL CONVERSION PROCESS BETWEEN THE AEROBIC AND ANAEROBIC REGION IN THE COUPLED AEROBIC-ANAEROBIC SYSTEM** **814**
Sun shiyang,Cao peng

1033-1898711 **RESEARCH ON HEAVY METAL BIOACCUMULATION IN WASTEWATER BY JUJUBE METALLOTHIONEIN(MT) GENETIC ENGINEERING BEACTERIA SYSTEM** **818**
Jinfeng Huang, Qinglan Ma , Hongping Chen, Qiufen Cao, Wang Kai

1034-1901593 **ENHANCED REMOVAL OF ALPHA-PINENE BY A BIOTRICKLING FILTER INOCULATED WITH PSEUDOMONAS STRAINS** **822**
Zhuowei Cheng, Yifeng Jiang,Jianmeng Chen, Zengliang Gao

1035-1927073 **SELECTIVE REMOVAL OF NITROGEN-CONTAINING COMPOUNDS FROM TRANSPORTATION DIESEL FUELS OVER FECL3/SBA-15** **827**
Shengqiang Wang, Lei Yang, Hongbing Yu,Ruicong Wang

Optimization Analysis of Automotive Rear Spindle Using Shape Optimization For Purpose of Weight Reduction

Wan Mansor Wan Muhamad[1*], Gunawan[1,2]
Endra Sujatmika[1], L. Mohd. Fadzil[1]
[1]Mechanical and Manufacturing Section, MFI
Universiti Kuala Lumpur (UniKL)
Selangor, Malaysia
[2]Departement of Mechanical Engineering,
Engineering Faculty, Sriwijaya University,
Palembang Indonesia
[*]drwmansor@mfi.unikl.edu.my

***Abstract*— In this paper optimization process was performed to have light component. Shape optimization was applied to front rear spindle in order to reduce its mass. Finite Element software, Hypermesh was used for preprocessing procedure and Hypermorph used to define the shape variables to have the optimum results for the front rear spindle. The optimization solver Optistruct used to solve the problem with maximum stress equal to yield stress as a design constraint to make sure the redesigned shape's stresses will not exceed the yield point. The results of the optimization process showed that the mass reduction using Optistruct was 8.37% of the original mass because of the limited changes due to the design space constraint. Mass reduction depends on the design space while the stress can be used as a controlling constraint to the optimization process. Reduction in weight for automotive industry will have good impact by saving more material, reduce cost and produce efficient cars.**

Keywords-Optimization; rear spindle; shape

I. INTRODUCTION

Car's components are subjected to many types of loadings; those components are designed and manufactured to meet the requirements for strength and safety.

CAD tool is developed to assist the engineers for better design and modeling process regarding to the modeling time. Another tool had been developed beside the CAD software which is CAE. This tool has great contribution to all the engineering fields. The needs of the CAE in industrial field are reported by Yoshio Kojima [1,2].

Optimization methods were developed to have lighter, less cost and may have better strength too. Many optimization types, methods and tools are available nowadays due to the revolution of the high speed computing and software development. There are four disciplines for optimization process [3,4,5].

a) Topology optimization: it is an optimization process which gives the optimum material layout according to the design space and loading case.

b) Shape optimization: this optimization gives the optimum fillets and the optimum outer dimensions.

c) Size optimization: the aim of applying this optimization process is to obtain the optimum thickness of the component.

d) Topography: it is an advanced form of shape optimization, in *which a design region is defined and a pattern of shape variable will generate the reinforcements.*

Finite element method used for many type of analysis, such as linear analysis, nonlinear analysis, fatigue analysis and another types. FE analysis was developed to solve the optimization process such as Optistruct linear solver [3], TopShape [6].

Optimization process for this work was conducted using Optistruct solver in order to reduce the mass of the component which will reduce the cost too much with respect to the mass production process.

II. 2. OBJECTIVE

This research aims to contribute to the development of structural design and mass reduction of vehicle components (rear spindle) using shape optimization by the gradient based method. Optimization process for this work was conducted using OptiStruct solver in order to reduce the mass of the component which will reduce the cost with respect to the mass production process.

III. METODOLOGY

Shape optimization was applied to reduce volume of rear spindle model. OptiStruct was used to perform the process. The approach is shown in Fig 1.

All of the optimization processes use some application software that included in the HyperWorks. Using HyperMesh as one of the application, solid model was imported for finite element modeling which is loads and constraints applied.

978-1-61284-365-0/11/$26.00 ©2011 IEEE

Shape optimization process requires shape definition for design variables and HyperMorph can be used to conduct such purposes.

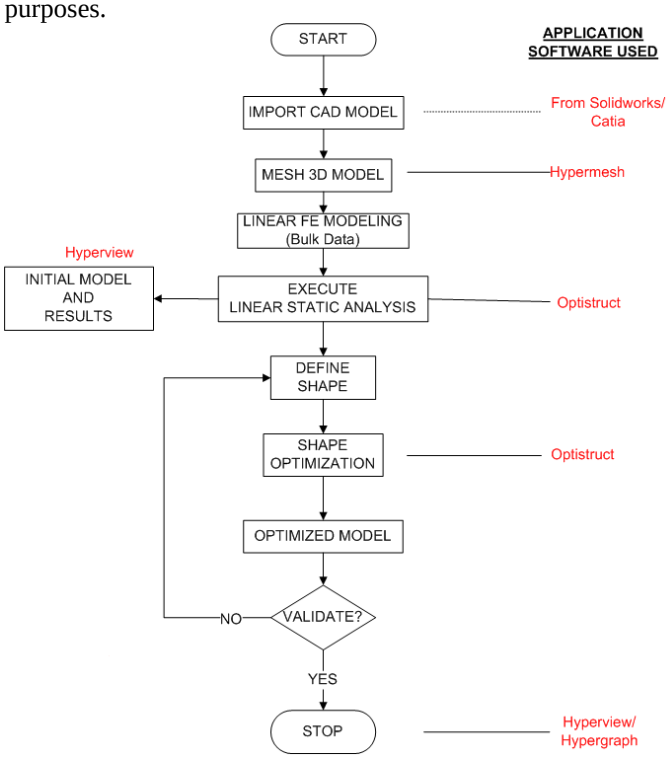

Figure 1. Design optimization flowchart

IV. MODEL AND NUMERICAL ANALYSIS

A. Finite Element Model

Finite element model for spindle is shown in Fig. 2 below,

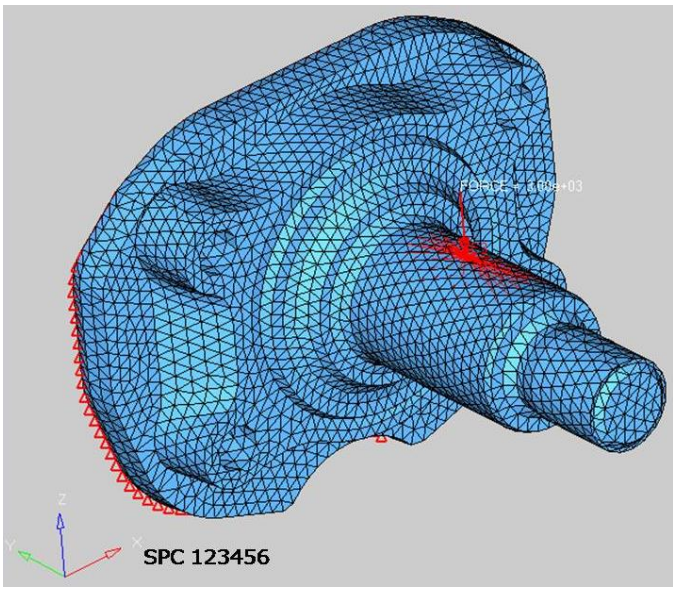

Figure 2. Finite elemen rear spindle model

The applied material properties are presented in Table 1.

TABLE I. MATERIAL PROPERTIES OF REAR SPINDLE

Material	Steel
Density	7.85e-9 tonne/mm^3
Poisson's Ratio	0.3
Modulus of elasticity	200000 MPa
Yield Stress	478.32 MPa
Ultimate tensile stress	621 MPA

B. Boundary Conditions and Loading

In actual test, the rear spindle is welded when it subjected to the load. To represent this condition it is constrained from the back with six degree of freedom constrains.

A cases were applied to investigate the maximum stress levels. The applied loads was chosen based on the actual test (fatigue test) there must be no failure with ± 2500N excitation at > 300,000 cycles, so 3000N load was used in this model.

C. Optimization Parameters

The vector of nodal coordinates (**x**) is used to define the shape of rear spindle structure in finite elements model. Changes of the boundary in model structure will translate to interior of mesh to avoid distortion of the elements when shapes change. During shape optimization, there are two approaches that can be used to account for mesh changes; those are the basis vector approach and the perturbation approach. Those approaches refer to the definition of the structural shape as a linear combination of vectors.

Using the **basis vector approach**, the structural shape is defined as a linear combination of basis vectors. The basis vectors define nodal locations.

$$x = \sum DV_i \,.\, BV_i \qquad (1)$$

Where **x** is the vector of nodal coordinates, BV_i is the basis vector associated to the design variable DV_i.

Using the **perturbation vector approach**, the structural shape change is defined as a linear combination of perturbation vectors. The perturbation vectors define changes of nodal locations with respect to the original finite element mesh.

$$x = x_o + \sum DV_i \,.\, PV_i \qquad (2)$$

Where **x** is the vector of nodal coordinates, x_o is the vector of nodal coordinates of the initial design, PV_i is the perturbation vector associated to the design variable DV_i.

The objective of this optimization is to minimize volume while maximum stress of the elements became constraint variable. Design variables were determined using Hypermorph. There are 6 shapes were defined (shape 1, shape 2, shape 3, shape 4, shape 5, and shape 6) as design variables

V. RESULT AND DISCUSSION

Initial simulation of a spindle in static analysis, the result is shown in the figure below

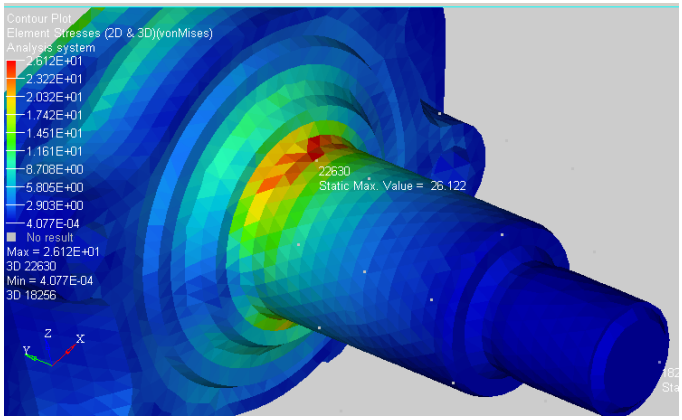

Figure 3. Rear spindle stress contour at initial run

From fig 3. show that maximum stress is 26.12 MPa and located in the node 92039. When comparing the maximum stress (23.209 MPa) with the yield stress (478.32 MPa) for this situation, it shows the yield stress is much higher than the maximum stress. In this case the safety factor is very high; this means that the current material for the rear spindle has very high strength. The maximum stress only in litle area and we can perform optimization stage in the others area.

The figures 5 – 9 are shape optimization results,

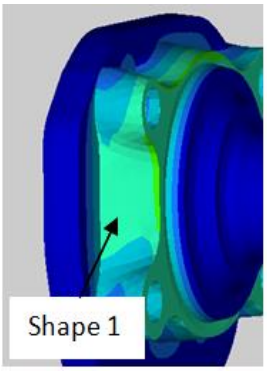

Figure 4. Shape 1

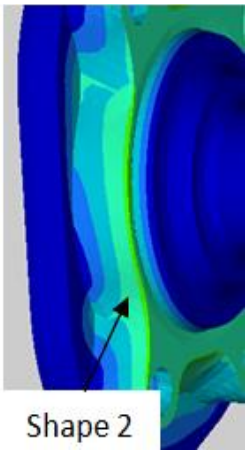

Figure 5. Shape 2

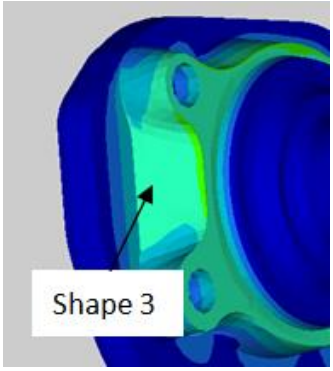

Figure 6. Shape 3

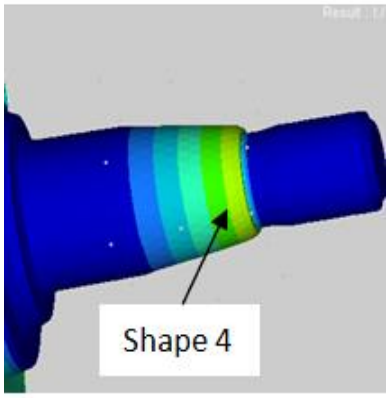

Figure 7. Shape 4

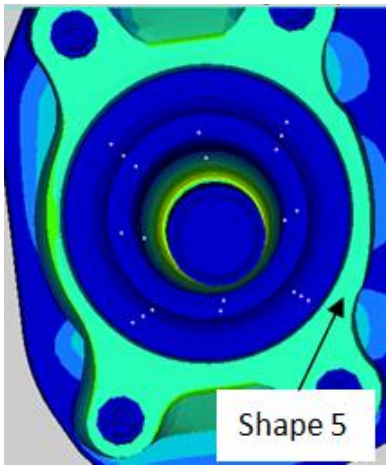

Figure 8. Shape 5

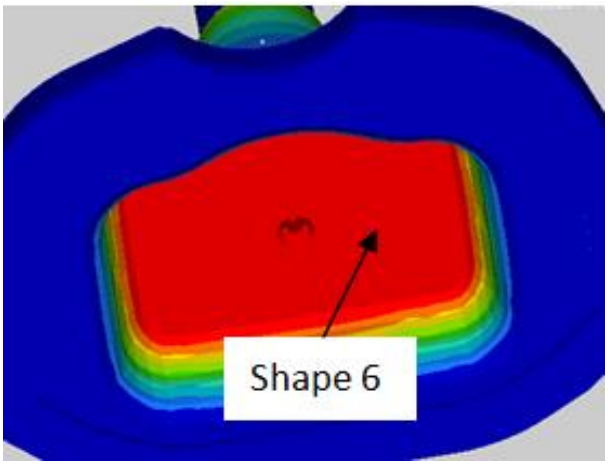

Figure 9. Shape 6

Simulation takes place in six iterations and at the last two iterations reach convergence of design variables. The shape 6 had the most reduction among all shapes.

Maximum stress at the end of the iteration does not show significant changes compared with the stress in the early iterations. This suggests that the shape changes do not affect to the value and location of maximum stress.

The objective of the research is to reduce the mass (represented by reduction volume) using shape optimization, fig. 10 shows the graph of volume minimization versus the iteration of the shape optimization process. The mass reduction for the front spindle was 17.2%.

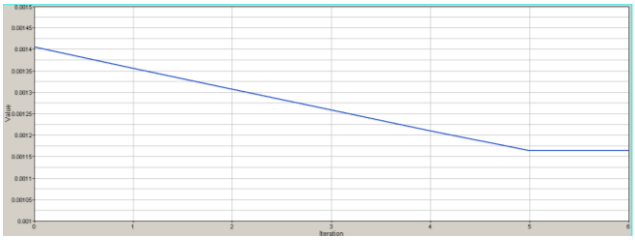

Figure 10. Objective function vs iteration

VI. CONCLUSIONS

Shape optimization used for this research in order to reduce the mass to have lighter component. The results of the optimization process showed that the mass reduction using Optistruct was 17.2%. of the original mass because of the limited changes due to the design space constraint. Mass reduction depends on the design space while the stress can be used as a controlling constraint to the optimization process.

REFERENCES

[1] Zurofi M., Manufacturing Process Effects on Fatigue Design and Optimization of Automotive Components– An Analytical and Experimental Study, The University of Toledo, Ph.D. thesis, (2004).

[2] Rao S.S., “Engineering Optimization Theory and Practice”, John Wiley & Sons, Inc.,(2009), 4th edition

[3] Altair Hyperworks 10, Altair Engineering Inc., (2010), India.

[4] Kojima,Y., “Mechanical CAE in automotive design”, R & D review of Toyota CRLD, Vol 35, No. 4, (2000).

[5] Obayashi S, Tsukahara T. “Comparison of optimization algorithms for aerodynamic shape design”. AIAA Journal, (1997), Vol. 35, No. 8, pp.1413–5.

[6] Richards RA. Zeroth-order shape optimization utilizing a learning classifier system. PhD Dissertation, Mechanical Engineering Department, Stanford University (1995).