INTERNATIONAL CONFERENCE on APPLIED SCIENCES

- ICAS 2014 -

October 2-4, 2014

Hunedoara, Romania

Faculty of Engineering Hunedoara

Organizers:

Politehnica University of Timişoara, ROMANIA
Military Economics Academy of Wuhan, CHINA

in cooperation with:

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Huazhong University of Sciences and Technology, Wuhan
Naval University of Engineering, Wuhan
Zhongnan University of Economics and Law, Wuhan
Air Force Early Warning Academy, Wuhan
Air Force Academy "Henri Coandă", Braşov
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CONFERENCE PROGRAM

THURSDAY, 2nd OCTOBER 2014

16:00-20:00 Registration of participants – Hotel "Rusca"
20:00 Welcome Reception – Hotel "Rusca"

FRIDAY, 3rd OCTOBER 2014

8:00-9:30 Registration of participants – Faculty of Engineering
9:30-10:30 Opening Ceremony

Hall: Aula Magna of the Faculty of Engineering Hunedoara
Chairman: *HĂRĂU Carmen, Parliament of Romania, Chamber of Deputies*
Members of Presidium:
ARION Viorel (County Municipality of Hunedoara, Romania)
FANG Zengqi (Military Economics Academy of Wuhan, China)
FENG Shaozhong (Confucius Institute, Cluj-Napoca, Romania)
GAFTON Crinela (Chamber of Comerce and Industry Hunedoara, Romania)
GHERMAN Laurian ("Henri Coanda" Air Force Academy of Brasov, Romania)
GUO Zhonghou (Military Economics Academy of Wuhan, China)
KUMAR Amit (ArcelorMittal Hunedoara S.A., Romania)
ŞERBAN Viorel Aurel (Politehnica University of Timisoara, Romania)
PĂNOIU Caius (Politehnica University of Timisoara, Romania)
XI Yang (Eurosport DHS S.A. Hunedoara, Romania)

10:30-11:00 Coffee Break
11:00-12:30 Plenary Session 1

Hall: Aula Magna of the Faculty of Engineering Hunedoara
Chairman: *GUO Zhonghou (Military Economics Academy of Wuhan, China)*

11:00-11:30 *POPOVICIU Mircea Octavian (Academy of Romanian Scientists – Timisoara Branch, Romania): Timisoara Politehnica University, the beginning file 1920-1948*
11:30-12:00 *JIANG Yiwen (Military Economics Academy of Wuhan, China): The Relationship between Military Expenditures and Economic Growth-A case study of the United States, Russia, Japan, India and China*
12:00-12:30 *LATINOVIC Tihomir (University of Banja Luka, Bosnia and Herzegovina, Republic of Srpska): Develop virtual joint laboratory for education like distance engineering system for robotic applications*
12:30-15:00 Lunch – Hotel "Rusca"
15:00-17:00 PARALLEL SESSIONS

SESSION 1: ENGINEERING AND FUNDAMENTAL SCIENCES

Chairmen: *BORDEAŞU Ilare (Politehnica University of Timisoara, Romania), PATER Lucian Flavius (Politehnica University of Timisoara, Romania)*

15:00-15:15 *DEACONU Sorin Ioan (Politehnica University of Timisoara, Romania): Dual Stator Winding Variable Speed Asynchronous Generator: Optimal Design and Experiments*
15:15-15:30 *ANDREI Victor ("Politehnica" University of Bucharest, Romania): Experimental research on quality features of metallurgical coke*

15:30-15:45	*LEMLE Ludovic Dan (Politehnica University of Timisoara, Romania): On the L^{∞}-uniqueness of pre-generators*
15:45-16:00	*BEŞEA Liviu Marian ("Politehnica" University of Bucharest, Romania): Constructive & functional modernization of EAF*
16:00-16:15	*BEŞEA Liviu Marian ("Politehnica" University of Bucharest, Romania): About EAF and Environment*
16:15-16:30	*OSACI Mihaela (Politehnica University Timisoara, Romania): Studies about the attempt frequency influence on the effective relaxation time in a system of nanoparticles for magnetic hyperthermia*
16:30-16:45	*SOCALICI Ana (Politehnica University of Timisoara, Romania): The influence of the cast iron structure upon the hardness of brake shoes meant for the rolling stock*
16:45-17:00	*RUSU-ANGHEL Stela (Politehnica University of Timisoara, Romania): State control of robotic arm*

SESSION 2: ECONOMICS AND HEALTH SCIENCES

Chairmen: *GHERMAN Laurian ("Henri Coanda" Air Force Academy of Brasov, Romania), ROŞU Şerban (University of Medicine and Pharmacy "Victor Babes" Timisoara, Romania)*

15:00-15:15	*GUO Zhonghou (Military Economics Academy of Wuhan, China): The Nonlinear Relationship between Defense Expenditure and Economic Growth in China - An Empirical Analysis Based on MS-AR Model*
15:15-15:30	*QI Feng (Military Economics Academy of Wuhan, China): The surface micro topography and composition analysis of wool /polyester clothing*
15:30-15:45	*ANGHEL Iulia (Romanian Academy - Iasi Branch, Romania): Transitional society and the new economic roles of gender*
15:45-16:00	*FANG Zengqi (Military Economics Academy of Wuhan, China): A Scheme for Legislating the Signature Procedure of China National Defense Contracts*
16:00-16:15	*BENEA Marius (Politehnica University Timisoara, Romania): The Use of Social Media in Romanian Political Marketing*
16:15-16:30	*IACOB Olimpia (University of Agricultural Sciences and Veterinary Medicine Iaşi, Romania): A case of Nosema apis (Microsporea: Nosematidae) infection in humans induced by regular bee bread consumption*
16:30-16:45	*YU Jiajian (Military Economics Academy of Wuhan, China): A study on the improvement measures of the elements in military accounting statement on the accrual basis of accounting*
16:45-17:00	*MUNTEANU Rareş (University of Petrosani, Romania): Mining revival – a chance for recovering from crisis*
17:00-17:15	*ZHOU Dan (Military Economy Academy Wuhan, China): Analysis on Development of Specific Human Resource in Defense Economics*
17:00-17:30	Coffee Break
17:30-19:30	PARALLEL SESSIONS

SESSION 3: ENGINEERING AND FUNDAMENTAL SCIENCES

Chairmen: *LEMLE Ludovic Dan (Politehnica University Timisoara, Romania)*
LATINOVIC Tihomir (University of Banja Luka, Bosnia and Herzegovina)

17:30-17:45	*PĂNOIU Manuela (Politehnica University of Timisoara, Romania): Video Streaming Technologies Using ActiveX and LabVIEW*
17:45-18:00	*ARDELEAN Erika (Politehnica University of Timisoara, Romania): Technological aspects at continuous casting of semi-finished products with φ270mm*
18:00-18:15	*BARZ Cristian (Technical University of Cluj-Napoca, Romania): Using HMI Weintek in command of an industrial robot arm*
18:15-18:30	*BENEA Laura (Politehnica University of Timisoara, Romania): Characterization of the WC coatings deposited by plasma spraying*
18:30-18:45	*BORDEAŞU Dorin (Via University College, Horsens, Denmark): Laser beam treatment effect on AMPCO M4 Bronze cavitation erosion resistance*
18:45-19:00	*BORDEAŞU Dorin (Via University College, Horsens, Denmark): Influence of volumic heat treatments upon cavitation erosion resistance of duplex X2CrNiMoN22-5-3 Stainless Steels*
19:00-19:15	*ROB Raluca (Politehnica University of Timisoara, Romania): Study regarding the power quality improvement in functioning of nonlinear loads*
19:15-19:30	*GĂMAN Mugurel-Nicolae (Romanian Railway Authority – AFER, Romania): On the structure of molded steel thermic*

SESSION 4: ECONOMICS AND HEALTH SCIENCES

Chairmen: *IACOB Olimpia (University of Agricultural Sciences & Veterinary Medicine Iaşi, Romania), JIANG Yiwen (Military Economics Academy of Wuhan, China)*

17:30-17:45	*ROŞU Şerban (University of Medicine and Pharmacy "Victor Babes" Timisoara, Romania): Reconstruction of a labio-mentonier defect through a compound free flap - clinical case*
17:45-18:00	*ZHANG Lijun (Military Economics Academy of Wuhan, China): Performance related pay system of Modern enterprise and US DoD and its enlightenment*
18:00-18:15	*FRĂȚILĂ Mihaela (University of Medicine and Pharmacy "Victor Babes" Timisoara, Romania): Effectiveness study of radiographic examination in oroantral fistula diagnosis after tooth extraction*
18:15-18:30	*GRIGORE Constantin (Politehnica University of Timisoara, Romania): Final physical training programs specific for each roll in the performance volleyball obtained from experimental research*
20:00	Conference Dinner – Hotel "Rusca"

SATURDAY 4th OCTOBER 2014

9:30-10:30 PLENARY SESSION 2

Chaiman: *PĂNOIU Manuela (Politehnica University of Timisoara, Romania)*

9:30-10:00	*DEHELEAN Cristina (University of Medicine and Pharmacy "Victor Babes" Timisoara): To be announced*
10:00-10:30	*LI Xuewu (Military Economics Academy of Wuhan, China): Construction of emergency response force*
10:30-11:00	Coffee Break

11:00-12:00 POSTER SESSION

Chairmen: *BARCZI Attila (Szent István University, Gödöllő, Hungary)*
KISS Imre (Politehnica University of Timisoara, Romania)

01. *BUZDUGA Radu Vasile (Research and Development Institute for Refractories and Ceramic Products – CCPPR, Alba Iulia, Romania): Research on uses vegetables ashes in processing powders for classical moulding of steel*
02. *SHABANI Lulzim (University "Pjeter Budi" of Pristina, Kosovo): e–Government as socio-economic tend – Kosovo case study*
03. *CUNȚAN Corina (Politehnica University of Timisoara, Romania): Using microcontrollers for orienting a set of mirrors to focus the light beam*
04. *POPA Erika (Politehnica University of Timisoara, Romania): Industrial research on the quality of brake shoes meant for rolling stock*
05. *BARCZI Attila (Szent István University, Gödöllő, Hungary): Preservation of the kurgans in Békés County, Hungary*
06. *NAGY Valeria (University of Szeged, Hungary): Development and validation of microwave technological methodology for biodiesel production*
07. *SÁROSI József (University of Szeged, Hungary): Dynamic Investigation of a PAM Actuated Vibrating Pendulum*
08. *POPA Gabriel Nicolae (Politehnica University of Timisoara, Romania): Control of Industrial Plate-Type Electrostatic Precipitator with Three Sections with Microcontroller*
09. *POPA Iosif (Politehnica University of Timisoara, Romania): Spotting the earth connections and short circuits between the electric conductors, using D.C. bridges for resistance measuring*
10. *DINIŞ Corina (Politehnica University of Timisoara, Romania): Study on sources of charging lead acid batteries*
11. *FLORI Mihaela (Politehnica University of Timisoara, Romania): CFD numerical simulation of air natural convection over a heated cylindrical surface*
12. *MITITELU Cosmin Petre (Politehnica University of Bucharest, Romania): New technology for ferrous oxide waste utilization efficiency of reducting the melting iron cupola getting foundry*
13. *MITITELU Cosmin Petre (Politehnica University of Bucharest, Romania): Analysis of financial and economic feasibility study of the technique for implementation a new waste processing technology of ferrous oxide through melting in cupola reducing valves*

14. *JITIAN Simion (Politehnica University of Timisoara, Romania): The External Reflection of Monochromatic Light on Superficial Films on Solid Substrate*
15. *BERDIE Adela (Politehnica University of Timisoara, Romania): A datafit approach concerning to the data processing*
16. *MIHUȚ Gabriela (Politehnica University of Timisoara, Romania): Simulation of the bimetal cast in the case of milling rolls*
17. *ARDELEAN Marius (Politehnica University of Timisoara, Romania): Environmental impact of brown fields sites in Hunedoara area*
18. *IAGĂR Angela (Politehnica University of Timisoara, Romania): Analysis the electrical parameters of a medium-frequency induction furnace*
19. *VASIU Teodor (Politehnica University of Timisoara, Romania): Determining the reliability of DACIA 1304, 1,9D vans*
20. *JOSAN Ana (Politehnica University of Timisoara, Romania): Using lateral cores to casting of carbon steel parts, of drive wheel type, in a metallurgical enterprise*
21. *JOSAN Ana (Politehnica University of Timisoara, Romania): Using special additions to preparation of the moulding mixture for casting steel parts of drive wheel type*
22. *SOCALICI Ana (Politehnica University of Timisoara, Romania): Valorization of Powdery Ferrous Wastes in Siderurgy*
23. *ALEXA Vasile (Politehnica University of Timisoara, Romania): Production planing using the specialized software Technomatix Plant Simulation*
24. *POP-VĂDEAN Adina (Technical University of Cluj-Napoca, Romania): Applications of energy harvesting for ultra low power technology*
25. *POP Petrică (Technical University of Cluj-Napoca, Romania): Considerations regarding the concept of the level of reality in the process of learning the trans-disciplinary approach*
26. *RAȚIU Sorin (Politehnica University of Timisoara, Romania): Functional performance testing of the universal super absorbing air filters FSU 70 „Air by Corneliu"*
27. *BRĂNESCU Elena (Politehnica University of Bucharest, Romania): Experimental research on the characteristics of softening and melting of iron ore as the major factor of influence on gas permeability of blast furnace charge*
28. *BRĂNESCU Elena (Politehnica University of Bucharest, Romania): Experimental research on the characteristics of reducibility and mechanical strength of ferrous sinters*

12:00-18:00 Excursion

18:00 End of the conference

Book of ABSTRACTS

PLENARY SESSION

TIMISOARA POLITEHNICA UNIVERSITY, THE BEGINNING FILE: 1920-1948

Author: **M.O. POPOVICIU**

Abstract: In introduction are presented data of Timisoara and a few extremely important historical events of this town. Discussing the founding the Polytechnic School there is put into evidence the role of the Mayor Stan Vidrighin, which donate four buildings and 10 Ha of land, as well as the first Rector Traian Lalescu, a fine connoisseur of various universities, the man which established the future directions of the school development. From the other over one hundred persons, considered founders of this school, were selected five important personalities which are shortly presented: Plautius Andronescu, Remus Radulet, Aurel Barglazan, Dan Mateescu and Coriolan Dragulescu.

THE RELATIONSHIP BETWEEN MILITARY EXPENDITURES AND ECONOMIC GROWTH - A CASE STUDY OF THE UNITED STATES, RUSSIA, JAPAN, INDIA AND CHINA

Authors: **Y.W. JIANG,** J.X. MA, X.Y. XIAO

Abstract: This paper presents an exploration of the realistic relationship between national economic growth and military expenditures in 5 major states: the United States, Russia, Japan, India and China. Using statistical and case study methodologies, it examines how each country's military expenditure responded to increases in output levels and rates of growth over the period 1988~2013, proposes plausible explanations for the relationship in each country. If the experience holds true, economic growth in these countries will spur them to increase their rate of military expenditure growth and, as a result, their military capabilities. As we show, however, each country is unique, and strong economic growth by no means implies automatic expansion of military spending or capabilities. In fact, the analysis suggests that perceived threats from abroad may be the most significant factor contributing to increases in military expenditure. This distinction is important because policies designed to deter foreign military expansions motivated by ambition may have perverse effects if foreign military expansions are in fact motivated by fear. This paper should benefit particularly to policymakers concerned of the prospect of increased military expenditures by large and rapidly increasing economies.

DEVELOP VIRTUAL JOINT LABORATORY FOR EDUCATION LIKE DISTANCE ENGINEERING SYSTEM FOR ROBOTIC APPLICATIONS

Authors: **T. LATINOVIC,** S. DEACONU, M. LAZAREVIC, N. MALEŠEVIĆ, C. BARZ

Abstract: This paper work with a new system that provides distance learning and online training engineers. The purpose of this paper is to develop and provide web-based system for the handling and control of remote devices via the Internet. Remote devices are currently the industry or mobile robots. For future product development machine in the factory will be included in the system. This article also discusses the current use of virtual reality tools in the fields of science and engineering education. One programming tool in particular, virtual reality modeling language (VRML) is presented in the light of its applications and capabilities in the development of computer visualization tool for education. One contribution of this paper is to present the software tools and examples that can encourage educators to develop a virtual reality model to improve teaching in their discipline. This paper aims to introduce a software platform, called VALIP where users can build, share, and

manipulate 3D content in cooperation with the interaction processes in a 3D context, while participating hardware and software devices can be physical and /or logical distributed and connected together via the Internet. VALIP the integration of virtual laboratories to appropriate partners; therefore, allowing access to all laboratories in any of the partners in the project. VALIP provides advanced laboratory for training and research within robotics and production engineering, and thus, provides great laboratory facilities with only having to invest a limited amount of resources at the local level to the partner site.

CONSTRUCTION OF EMERGENCY RESPONSE FORCE

Authors: **X.W. LI**

Abstract: Emergency response is an important task facing China and even all over the world. This article is based on China`s emergency response to the problems existing in the construction, and putting forward the principle of the construction of emergency response force of China should follow and the measures to be taken.

Session: ENGINEERING AND FUNDAMENTAL SCIENCES

DUAL STATOR WINDING VARIABLE SPEED ASYNCHRONOUS GENERATOR: OPTIMAL DESIGN AND EXPERIMENTS

Authors: L.N. TUTELEA, S.I. DEACONU, G.N. POPA

Abstract: In the present paper is carried out a theoretical and experimental study of dual stator winding squirrel cage asynchronous generator (DSWA) behaviour in the presence of saturation regime (non-sinusoidal) due to the variable speed operation. The main aims are the determination of the relations of calculating the equivalent parameters of the machine windings to optimal design using a Matlab code. Issue is limited to three phase range of double stator winding cage-induction generator of small sized powers, the most currently used in the small adjustable speed wind or hydro power plants. The tests were carried out using three-phase asynchronous generator having rated power of 6 [kVA].

ON THE L^{∞}-UNIQUENESS OF PRE-GENERATORS

Authors: **L.D. LEMLE**, Y. JIANG, F. PATER

Abstract: We will present several properties for C_0-semigroups of linear operators on the dual of a Banach space and then we shall prove the L^{∞}-uniqueness of several important operators from mathematical-physics.

CONSTRUCTIVE AND FUNCTIONAL MODERNIZATION OF EAF

Authors: A. IOANA, P. MOLDOVAN, N. CONSTANTIN,
A.E. PREDA, **L.M. BEŞEA**

Abstract: This article presents the main constructive and functional modernization of Electric Arc Furnace (EAF). W.E. Schwabe, is the creator of UHP (Ultra High Power) EAF. We present in this article the optimal use of EAF power and time aspects. These two main factors determine the increase in the productivity of the Electric Arc Furnace. Electric arc furnace operation can be based on either the short arc (with high intensity and low voltage) or long arc version (with low intensity and high voltage). Introduction of vault walls and water cooled has resulted in major reductions in the consumption of refractory bricks from electric arc furnace. Another important technological evolution inserted in the process of elaboration of steel in electric arc furnace is lowering the temperature of the exhaust. Using a system of intensive oxygen insufflations during melting can get many technological advantages. Another constructive and functional modernization is EAF inflatable sealing device for retention of slug.

ABOUT EAF AND ENVIRONMENT

Authors: A. IOANA, P. MOLDOVAN, N. CONSTANTIN, A.E. PREDA, **L.M. BEŞEA**

Abstract: In this paper we present the results of industrial experiments consisted in determination, by specialized measurements, of the dust percentage in the evacuated gases from the EAF and of chemical composition of polluting burnt gases. The electric arc furnaces (EAFs), as powerful energy consumers, are also polluting emissions generators with an important environmental impact. The steel refining in the EAF is based on a complex mechanism of oxidizing chemical processes, due to the introduced oxygen and air. A first step is the diffusion and adsorption on the slag surface of molecular oxygen. The most significant polluting emissions of the EAF are metallic and oxides powders driven by emergent gases.

STUDIES ABOUT THE ATTEMPT FREQUENCY INFLUENCE ON THE EFFECTIVE RELAXATION TIME IN A SYSTEM OF NANOPARTICLES FOR MAGNETIC HYPERTHERMIA

Authors: M. CACCIOLA, **M. OSACI**

Abstract: Currently, in nanomagnetism, the study of magnetic nanoparticle systems and especially the iron oxides γ-Fe_2O_3& Fe_3O_4 occupies a special place because of the biomedical applications, in particular for the nanofluid-based magnetic hyperthermia. In the magnetic hyperthermia with nanocolloids, several heating mechanisms are possible, associated with susceptibility loss, hysteresis loss and viscous heating, i.e. stirring. The susceptibility loss occurs in the superparamagnetic particles and has two associated relaxation processes: the Néel relaxation process, corresponding to the magnetic moment rotation between two equilibrium positions, and the Brownian relaxation process, corresponding to the particle rotation in a liquid environment. These relaxation times give effective relaxation time. In many papers, the attempt frequency from Néel relaxation time is considered to be $f_0=10^9$ s^{-1} and depends only on the material properties, although, in most cases, the actual system conditions are beyond the single particle model in the absence of the external magnetic field. This paper presents a series of studies about the modality in which the attempt frequency influences the Néel relaxation time and thus the effective relaxation time, in a spherical nanoparticle saturated system in external magnetic field. The nanoparticles have a random distribution, and their magnetic moments have a magnetic dipole-dipole interaction, along with the distributions of sizes and anisotropy constants. Regarding the high complexity level of the problem, it seems useful to consider the numerical experiments by computational simulation.

THE INFLUENCE OF THE CAST IRON STRUCTURE UPON THE HARDNESS OF BRAKE SHAOES MEANT FOR THE ROLLING STOCK

Authors: **A. SOCALICI**, L. PASCU, E. POPA, T. HEPUT

Abstract: An important characteristic with a high impact upon the exploitation durability of the brake shoes is hardness. The paper introduces the influence of the phosphorous cast iron structure upon the hardness of the brake shoes meant for the tractive and trailing rolling stock. The results presented show the variation of hardness on the surface and the cross section of the braking shoe.

STATE CONTROL OF ROBOTIC ARM

Authors: **S. RUSU-ANGHEL**, N. RUSU, I.C. LIHACIU

Abstract: In control engineering, a state space representation is a mathematical model of a physical system as a set of input, output and state variables related by first-order differential equations. To abstract from the number of inputs, outputs and states, the variables are expressed as vectors. Additionally, if the dynamical

systems linear and time invariant, the differential and algebraic equations may be written in matrix form. The state space representation (also known as the & quot; time-domain approach & quot) provides a convenient and compact way to model and analyze systems with multiple inputs and outputs. With inputs and outputs, we would otherwise have to write down Laplace transforms to encode all the information about a system. Unlike the frequency domain approach, the use of the state space representation is not limited to systems with linear components and zero initial conditions. & quot; Statespace & quot; refers to the space whose axes are the state variables. The state of the system can be represented as a vector within that space.

CHARACTERIZATION OF THE WC COATINGS DEPOSITED BY PLASMA SPRAYING

Authors: **L.M. BENEA**, L.P. BENEA

Abstract: On the martensitic non-corrosive steel support (Z12CNDV12), it is deposited using a plasma jet, tungsten carbide in three different thicknesses. The characteristics of the coatings are determined by: its chemical composition, optical microscopy, RX analysis, tensile strength, Vickers hardness, the nature and the processing degree of the substrate and the deposition conditions. The method used for determining the corrosion behaviour of the WC coatings deposited by plasma spraying consists in measuring the electrochemical potential between the coating and the substrate, which are immersed in a solution containing NaCl as corrosive agent. The experimental results are then mathematically processed.

STUDY REGARDING THE POWER QUALITY IMPROVEMENT IN FUNCTIONING OF NONLINEAR LOADS

Authors: **R. ROB**, C. PĂNOIU

Abstract: Present paper represents a study about the variation of the electrical parameters during the functioning of a nonlinear load: an electrothermal installation with electromagnetic induction. In order to study the distorting regime effect induced into the power network (0.4kV) by the functioning of the electrothermal installation, 10 measuring sets were accomplished by increasing with 10% the consumed power of the installation. The measuring sets were studied also when a three phase passive filter system was connected at the point of common coupling.

TECHNOLOGICAL ASPECTS AT CONTINUOUS CASTING OF SEMI-FINISHED PRODUCTS WITH ϕ270mm

Authors: **E. ARDELEAN**, M. ARDELEAN, T. HEPUT, A. LĂSCUȚONI

Abstract: Continuous casting installation especially appreciated because steel can be poured in a more varied assortment. The flexibility of the system is not sufficient if the casting parameters are not properly adopted and adapted to the specific brand of steel. This paper presents some technical aspects relative to continuous casting of semi-finished products with φ270mm section. Graphical dependencies obtained in Excel and analytical equations of this allows to specialists from industry to adopt values for the addicted parameters according to the independent ones, already known.

LASER BEAM TREATMENT EFFECT ON AMPCO M4 BRONZE CAVITATION EROSION RESITANCE

Authors: I. BORDEAŞU, M.O. POPOVICIU, L.M. MICU, O.V. OANCA, **D. BORDEAŞU**, A. PUGNA, C. BORDEAŞU

Abstract: Ship propellers must resist simultaneously to ocean water corrosion and cavitation erosion. Till now, the best material used is the bronze with a great content of copper. The costs of such materials are very high and it exist the tendency to

reduce the copper content but to maintain the good properties. Such a material is AMPCO M4 used in the present for manufacturing details for aircraft retractable landing assemblies. In consequence we undertake cavitation erosion tests on this bronze. In natural state (cast or even extruded) the cavitation resistance is not acceptable so, we improved the specimens by treating them with laser beams at three different impulse powers (160, 180 and 220 W). The cavitation was generated in the Cavitation Laboratory of the Timisoara Politehnica University using a vibratory device respecting the conditions imposed by ASTM G2-2010 Standard. The comparisons with the genuine material (without any treatments) show that the applied procedure increased the hardness of the melted layer and in the same time the behavior to erosion.

USING HMI WEINTEK IN COMMAND OF AN INDUSTRIAL ROBOT ARM

Authors: **C. BARZ**, T. LATINOVIC, A. BALAN, A. POP-VADEAN, P. POP

Abstract: The present paper intends to highlight the utility and importance of HMI in the control of the robotic arm, commanding a Siemens PLC. The touch screen HMI Weintek eMT3070a is the user interface in the process command of Siemens PLC, in which are introduced the distances and displacement speeds on the three axes. The interface includes monitoring robotic arm movement but also allows its command by incrementing step by step the motion over axis.

INFLUENCE OF VOLUMIC HEAT TREATMENTS UPON CAVITATION EROSION RESISTANCE OF DUPLEX X2CrNiMoN22-5-3 STAINLESS STEELS

Authors: L.M. MICU, I. BORDEAȘU, M.O. POPOVICIU, M. POPESCU, **D. BORDEAȘU**, L.C. SĂLCIANU

Abstract: The stainless steels Duplex 2205 with austenite and ferrite structure have mechanical characteristics close to those of martensite stainless steels but a better corrosion resistance; these steels are very sensitive on the heat treatments. Present work studies the cavitation erosion for those steels for three different heat treatments: simply quenched, annealed at 475°C post quenching and annealed at 875°C. The researches were undertaken at Timisoara "Politehnica" University in the Laboratory of Material Science and the Laboratory of Cavitation, using the T2 facility which integrally respects the recommendation of ASTM G32-10 Standard. The best results were obtained with the specimens annealed at 875°C. In comparison with the stainless steel 41Cr4, with very good cavitation erosion qualities, all tested steels presented also good erosion resistance. So, Duplex 2205 steels can be used for details subjected to cavitation. The best results are obtained by increasing both the hardness and the quantity of the structure constituent with better cavitation erosion resistance, in our case the alloyed austenite.

VIDEO STREAMING TECHNOLOGIES USING ACTIVEX AND LabVIEW

Authors: **M. PANOIU**, C.L. RAT, C. PANOIU

Abstract: The goal of this paper is to present the possibilities of remote image processing through data exchange between two programming technologies: LabVIEW and ActiveX. ActiveX refers to the process of controlling one program from another via ActiveX component; one program acts as the client and the other as the server. LabVIEW can be either client or server. Both programs (client and server) exist independent of each other but are able to share information. The client communicates with the ActiveX objects that the server opens to allow the sharing of information. In the case of video streaming, most ActiveX controls can only display the data, being incapable of transforming it into a data type that LabVIEW can process. This becomes problematic when the system is used for remote image processing. We used ActiveX controls because the LabVIEW environment itself

provides little if any possibilities for video streaming, and the methods it does offer are usually not high performance. Hence, we chose to use existing software, specialized in video streaming along with LabVIEW and to capture the data provided by them, for further use, within LabVIEW. The software we studied (the ActiveX controls of a series of media players that utilize streaming technology) provide high quality data and a very small transmission delay, ensuring the reliability of the results of the image processing. We chose to process the data in the NI LabVIEW programming environment because it provides high performance toolkits and modules specialized in image processing.

EXPERIMENTAL RESEARCH ON QUALITY FEATURES OF METALLURGICAL COKE

Authors: **V. ANDREI**, N. CONSTANTIN

In order to analyze the influence of the parameters on the injection of hot air and pulverized coal flow on the replacement coefficient of metallurgical coke, it was taken into consideration the necessity of developing a 3D model of the metallurgical coke's heating area. The model can provide information regarding the following: the hot air and gas flow interaction with the pulverized coal; the mixing area of the pulverized coal with the injected air; the dispersion of pulverized coal on the tuyeres; the interaction of the coal and air with the flowing area in front of the tuyeres; The data collected could lead to information regarding the way technologies act to obtain an increased ratio for replacing metallurgical coke with pulverized coal from 0.78 – 0.8 to 1.0 – 1.1 kg coke/kg coal, and, an increased quantity of coal / ton of iron to an acceptable level of the replacement coefficient of coke from 80 – 90 kg / ton of iron to 130 – 150 kg / ton of iron, with noticeable impact on coke reduction in the iron elaboration in the blast furnace.

ON THE STRUCTURE OF MOLDED STEEL THERMIC

Authors: D.M. COSTEA, **M.N. GĂMAN**, G. DUMITRU

Abstract: The thermic welding steel used railway tracks and is obtained by burning thermite on the basis of aluminothermic reaction between iron oxide and aluminum, which are conducted by the reactions shown in the relations 1-3. Through these specific redox reactions resulting iron slag (Al_2O_3 – formula hereinafter referred corundum) and a significant amount of heat quantity generated. The thermite is a mixture of metal powders that contains mainly iron oxides (FeO, Fe_2O_3, Fe_3O_4), aluminum powder, ferro-alloys and moderators of response. The reaction moderators are added to the slag separation in a short time and improve flowability of the molten metal. The exothermic-burning of thermite reaction is developed the temperatures between 2500 and 3000°C. The reaction is very violent combustion and primed by firing a magnesium strip (the ignition temperature (the flash point) of the thermite is 1550°C) and does not need supplemental oxygen for further combustion reaction that once started the content in any kind of the environment.

Session: ECONOMICS AND HEALTHSCIENCES

A CASE OF NOSEMA APIS (MICROSPOREA: NOSEMATIDAE) INFECTION IN HUMANS INDUCED BY REGULAR BEE BREAD CONSUMPTION

Author: **O. IACOB**

Abstract: Investigations were conducted in the Parasitology and Parasitic Disease Clinic of the Faculty of Veterinary Medicine Iasi, on a breeder who consumed daily for a long period of time, as a supplement, a bee byproduct called bee bread, derived from their hives. Clinically, the subject, aged 32 years old, presented an advanced state of weakness, anorexia, headache, listlessness, severe diarrhea syndrome and

oscillating neurological disorders accompanied by aggressive and delusional seizures. Fecal and bee bread samples were studied for laboratory findings. The samples were assayed by direct and qualitative (Willis) or quantitative (Mc.Master) flotation methods. Examination and microphotography were performed by using Leica DM 750 optical microscope, Leica ICC 550 Camera and Leica Application Suite (LAS), version 4.2 (Oct. 2012), for image retrieval. The obtained results showed that in both fecal samples collected from the patient and the bee bread samples collected from the hives were identified Nosema apis spores, with a strong intensity (EPG: 20000-25000). These results confirm the Nosema apis infection in humans, triggering an alarm on the consumption of apiculture products and byproducts that are veterinary uncontrolled and warns not to ignore the risk of transmission to humans. It is the first case of Nosema apis spore infection in humans signaled in the country.

MINING REVIVAL – A CHENSE FOR RECOVERING FROM CRISIS

Authors: **R. MUNTEANU**, R.I. MORARU

Abstract: The development of the human society has always depended on material resources and energy. Mining provides the basic minerals and conventional source of energy necessary for all other industries. Therefore mining, together with agriculture, forestry and fishing represent the fundament of the economy. Accepting the necessity of mining represents a step towards the roots of the economy. Europe has a long tradition in mining. It was assessed that the rich reserves were exploited and it started to be too expensive to continue mining. Nevertheless, Europe still has resources, the progress of the technology and the increase of demand for resources made the European countries to turn once more towards mining. The renewable sources of energy are still too expansive, and so coal continues to be needed. Romania, as a part of Europe, faces the same challenges, and Romanian mining needs to continue. The present paper shows why mining must go on in Romania and particularly in the Jiu Valley. The paper gives a systematic and holistic overview of the challenges and opportunities which are ahead the Romanian mining industry in the upcoming two decades, in conjunction with the evolution of European and/or national economic policies and strategies.

TRANSITIONAL SOCIETY AND THE NEW ECONOMIC ROLES OF GENDER

Author: **I. ANGHEL**

Abstract: Romanian communism was characterized by a violent segregation of economic roles and by the isolation of gender labor force inside some closed economic patterns. The dissolution of the totalitarian order did not solve the problem of economic inequalities, and gender discrimination remained an essential feature of transitional societies. Also, the persistence of economic dependence of women stimulated the aggravation of some previous social and economical pathologies, such as: apparition of economic encapsulated enclaves, especially in the country side, stimulation of black labor market, due to the discrimination of women on accessing new professions, the conservation of a negative balance for gender participation in the field of private initiative. The entire phenomenon mentioned below affected the transition of the Romanian society towards a stabile and functional economical environment. This paper aims to explore three major issues regarding the new roles of gender in the economy of transitional states, with a special focus on the Romanian post communist experience. The first problem targeted in this research is the subject of gender economic exclusion in the rural space (in Romanian villages, gender labor force is very often pressed to accept unemployment or unpaid housework). The second level of the research is connected with the topic of gender effects over the entrepreneurial culture in transitional

societies (studies revealed a misbalance between genders in the case of entrepreneurial behavior, Lisowska, 2002). The third subject of study is focused on the relations between economic exclusion of gender and the educational policies and the social culture (the role of education in eliminating gender economic discrimination, Greenstein, 2004).

THE USE OF SOCIAL MEDIA IN ROMANIAN POLITICAL MARKETING

Authors: **M. BENEA**, O.D. BENEA

Abstract: The arrival of new media, and of the Internet in particular, has completely transformed the classical interactions between politicians, voters and the media. For politicians creating the appropriate networks to continue to exercise an influence over the debates is now vital: the applications of Web 2.0 are, for this purpose, a new opportunity. Facebook, Twitter, social networks... politics is also done on the Internet. A new essential type of media after the European referendum of 2005, and then Barack Obama overseas, have shown at which point it should henceforth count on this new democratic space. A space of anonymity and free speech, which disrupts the habits of elected officials and often undermines elaborate communication strategies. Viral videos, "buzz" at any level ... the internet worries the parties' top advisers. It is on the verge of attracting the hostility of some policies and communicants. This paper aims to explore the opportunities revealed by the use of Facebook and other social networks made by the candidates.

RECONSTRUCTION OF A LABIO-MENTONIER DEFECT THROUGH A COMPOUND FREE FLAP - CLINICAL CASE

Authors: **Ş. ROŞU**, M. FRĂŢILĂ

Abstract: Removal of the inferior facial third dramatically affects the vital functions of the body. A patient with inferior facial third removal cannot eat except nasogastric intubation, cannot breath without tracheotomy and cannot communicate with surrounding people. The purpose of this article is to present the microsurgical compound osseo-mio-coutaneous fibular flap used to reconstruct an inferior facial defect obtained after the removal of a malignant tumor of the mandibular body, anterior floor of the mouth, anterior lingual insertion and mental tissues. Our research presents the case of a 67 years old patient with mandibular carcinoma, with anterior invasion of the mental tissues and posterior invasion of the anterior floor of the mouth and lingual insertion that had to be removed together with the inferior facial third. In order to permit radiotherapy we decided immediate intraoperatory reconstruction of the defect by means of a microsurgical flap. The most suitable for that was the osseo-mio-coutaneous fibular flap. The operation had an exceptional morphological, functional and esthetical result. We faced a perfect integration of the flap that offered to the patient a good quality of life.

EFFECTIVENESS STUDY OF RADIOGRAPHIC EXAMINATION IN OROANTRAL FISTULA DIAGNOSYS AFTER TOOTH EXTRACTION

Authors: **M. FRĂŢILĂ**, Ş. ROŞU

Abstract: Oroantral fistula is a frequent casualty of the extraction of teeth from the upper side group, in particular the upper premolar and the first molar. Untreated oroantral fistula leads in most cases the penetration of germs from the non-sterile oral cavity in the sterile maxillary sinus, complicated consecutively with maxillary sinusitis and sinusal empyema. The purpose of this paper is to compare the various clinical and laboratory examination (radiography) used in establishing early diagnosis of oroantral fistula to find the method or combination of methods that ensure the highest accuracy in diagnosis. We considered patients with oroantral fistula after tooth extraction in whose diagnosis were used clinical examination,

palpation of the alveolar floor, Valsalva test to verify the existence of oroantral fistula completed with radiographic examination consisting of retroalveolar radiography, standard orthopantomography and frontal skull radiography, SAF incidence. The results in images allowed the comparative study of different methods of patient investigation.

FINAL PHYSICAL TRAINING PROGRAMS SPECIFIC FOR EACH ROLL IN THE PERFORMANCE VOLLEYBALL OBTAINED FROM EXPERIMENTAL RESEARCH

Author: **C. GRIGORE**

Abstract: Given the importance of defining the physical in getting sports performance, the present paper aims at to improve the physical in the game. In literature there are studies on physical preparation of volleyball players, but I think that physical training for each player, depending on the position they occupy in the team, it is considered to be a decisive element in performance in the game. This special preparation for each player based on the position represents something new and increases the performance of each player, and elite or more increases the performances in volleyball. The experimental physical training was done with one team that is part of the first echeloning the nationals by studying the development and evolution of each player after the implementation of this physical training program.

THE NONLINEAR RELATIONSHIP BETWEEN DEFENSE EXPENDITURE AND ECONOMIC GROWTH IN CHINA - AN EMPIRICAL ANALYSIS BASED ON MS-AR MODEL

Authors: **Z.H. GUO**, S.Q. LIU, L. JIN

Abstract: This paper, which was inspired by Laurent Ferrara, chooses the time series for national defense expense accounts for the central fiscal expenditure ratio during 1953-2010 as the empirical data and uses MS-AR model to carry out regime switching test. The research shows that: the Classification Schedule obtained by using the model agrees with the actual case in China very well, which indicates that the time series for national defense expense accounts for the central fiscal expenditure ratio was indeed influenced by a potential variable---the National Strategy; Since 1989, China's national defense policy is defensive and the national defense construction is subject to economic construction, and the defense expenditure would not have substantial increase as long as there is no serious threat to national sovereignty and security.

A STUDY ON THE IMPROVEMENT MEASURES OF THE ELEMENTS IN MILITARY ACCOUNTING STATEMENT ON THE ACCRUAL BASIS OF ACCOUNTING

Authors: **J.J. YU**, L.X. HU, L. ZHOU

Abstract: It is vital to the reform on the governmental accounting policy in China that is to introduce the accrual basis of accounting step by step, and stage by stage. In addition, to introduce the accrual basis into military accounting by a "progressive" means is the next step of the reform activity in this field. And this will have great effect on the recognization of the elements concerning the military accounting statements on the current cash basis. This paper precisely sets forth the characteristics of defining issue of the accrual basis. Meanwhile, the author also analyzes both the methods of how to introducing this basis in order to modify the current military accounting system, as well as the proposals to perfect and improve the elements in the military accounting statements.

A SCHEME FOR LEGISLATING THE SIGNATURE PROCEDURE OF CHINA NATIONAL DEFENSE CONTRACTS

Authors: **Z.Q. FANG**, L. DENG, L. YANG

Abstract: By taking the process of signing a national defense contract as the breakthrough point of this thesis, we propose a scheme for legislating the signature procedure of China national defense contracts, with suggestions on setting a standard for categorizing the signature procedures, building a procedure for disclosing information in advance, as well as on normalizing the criterion for selecting suppliers, for the purpose of embodying the principles of "fairness & efficiency, openness & impartiality and normalization" during signing such a contract.

THE SURFACE MICRO TOPOGRAPHY AND COMPOSITION ANALYSIS OF WOOL / POLYESTER CLOTHING

Author: **F. QI**

Abstract: In order to analysis whether the wool /polyester fabrics' aurora phenomenon relate to its surface microstructure and composition. This paper studied the wool /polyester surface microstructure by means of scanning electron microscopy (SEM), and also analyzed the surface material composition through the VERTEX 70 FT-IR spectrometer, CHNS /O Organic element analyzer and Gas chromatography mass spectrometry (GC-MS).We reached that the wool /polyester fabrics, wool scale severely damaged under the action of the tension, friction, compression and external mechanical forces in wearing process. The fabrics, surface really exists grease and lipid materials, which is also the important reasons that caused the fabrics aurora phenomenon.

PERFORMANCE RELATED PAY SYSTEM OF MODERN ENTERPRISE AND US DOD AND ITS ENLIGHTENMENT

Author: **L.J. ZHANG**

Abstract: Performance related pay is also called Appraisal related pay, and its basic features are the employee's salary is linked to the individual performance, and different individual performance leading to different payment. Modern enterprises and US DoD implemented performance related pay system earlier, and accumulated a lot of successful experience. To perfect the Chinese servicemen's salary system and build up the military performance related pay system with Chinese characteristics, researching on the advanced practice is of great significance.

ANALYSIS ON DEVELOPMENT OF SPECIFIC HUMAN RESOURCE IN DEFENSE ECONOMICS

Author: **ZHOU Dan**, ZHANG Hui, ZHOU Dongming

Abstracts: The defense economic realm own more professional talented person who are highly intensive and have high level than other social realms, therefore, the importance of developing and managing this kind of specific human resource in our army currently is outstanding at the time of constructing talented person troops. The quantities of this kind of specific human resource also have great influence in national defense science and technology industry. Firstly, this text analyzes the present condition of the specific human resource in national defense economic realm, and carries on contrast with the phenomenon that the specific talented person used in civil industrial realm. Secondly, aiming at the "ripped off" which is possible emergence problem under the incompletely contractual condition; we use the Psychological contracts theories to analyze the development and management of the specific human capital in national defense economic realm. Thirdly, by comparing with the four West Country's experience, and the request of our army currently under the condition that constructing a military with information-based

talented person. Finally, we put forward a counter plan suggestion for development and management problem of the specific manpower capital in national defense economic realm involving on this text.

POSTER SESSION

RESEARCH ON USES VEGETABLES ASHES IN PROCESSING POWDERS FOR CLASSICAL MOULDING OF STEEL

Authors: **R.V. BUZDUGA**, N. CONSTANTIN, E.A. LAZAR

Abstract: In this work we examine various possibilities of using vegetable ashes in processing powders for moulding steel, in order to reduce the consumption of steel. Thus, there have being studied vegetable ashes which can be used to process powders and then some moulding powder compositions have been analyzed.

USING MICROCONTROLLERS FOR ORIENTING A SET OF MIRRORS TO FOCUS THE LIGHT BEAM

Authors: C. SILAŞI, **C. CUNTAN**, I. BACIU

Abstract: The object of this paper is to analyze and to suggest improvements on intersection management systems using existing equipment currently available in street intersections. In order to do this, we designed an intersection management system capable of detecting traffic violations as well as vehicle collisions using high-speed cameras. We propose to implement the above mentioned system through design and simulation in the LabVIEW programming environment. LabVIEW offers all the instrumentation necessary to accurately simulate the phenomena that occur in modern-day intersections, making it possible to further develop the existing intersection technology. It also makes it possible to determine the requirements and limitations of the existing equipment and to find the best solutions for every scenario.

E–GOVERNMENT AS SOCIO-ECONOMIC TEND – KOSOVO CASE STUDY

Author: **L. SHABANI**

Abstract: The main mission of e-government in the first place is to provide a substantial increase of efficiency in the processing of massive requirements of citizens and providing administrative services within the state institutions, whether they are central or local institutions. There are increased amount of data for purchases, services and processing and is accelerated and the processing and storage of interactive databases and communication with customers. Likewise, e-governance contributes to long-term savings and significantly reduces the budget of the state apparatus. Substantial savings are possible, especially in the implementation of these governance models which interact in full horizontal communication among all relevant ministries, government institutions and public agencies or departments, and all state and local entities.

INDUSTRIAL RESEARCH ON THE QUALITY OF BRAKE SHOES MEANT FOR ROLLING STOCK

Authors: **E. POPA**, L. PASCU, A. SOCALICI, A. LASCUTONI

Abstract: Brake shoes wear appears as a normal exploitation process and depends both on the braking force and on the material the shoe is made of. Brake shoes are made of molded sulfurous cast iron. The industrial research and experiments aim at determining the specific characteristics of the phosphorous cast iron (chemical and structural homogeneity, hardness) and their optimization in view of improving the quality of the brake shoes meant for the rolling stock.

PRESERVATION OF THE KURGANS IN BÉKÉS COUNTY, HUNGARY

Authors: **A. BARCZI**, A. RÁKÓCZI, Á. PETŐ

Abstract: Ancient cemetery mounds so-called 'kurgans' (in Hungary: Cumanian mounds) have a great importance in the history of the Carpathian Basin considering cultural and nature conservation, landscape, archaeological, botanical and zoological viewpoints. The kurgans are thousands of years old national heritages. We can meet them in many areas of Eastern Europe. Unfortunately, the different agricultural activities resulted in their continuous degradation and their number also decreased over the past centuries. There were remarkable changes in agricultural regulation concerning Cumanian mounds in the EU – and in Hungary, too – in 2010. They were declared protected landscape elements therefore they became part of cross-compliance. In our research we will check the results of the new regulation in relation to the changes in the state of Cumanian mounds in Békés County.

DEVELOPMENT AND VALIDATION OF MICROWAVE TECHNOLOGICAL METHODOLOGY FOR BIODIESEL PRODUCTION

Authors: **V. NAGY**, G.KESZTHELYI-SZABÓ

Abstract: The energy is a key element for developments in the European Union. Impact of energy sector on the climate change, and the creation of energy independence are major challenges for the society. His Holiness Pope Francis proclaims: "I ask you to ensure that humanity is served by wealth and not ruled by it!" Every step is top priority and welcomed for society that aims to encourage the security of energy supply and to form a viable social model step by step in balanced and sustainable way. In essence, it is needed to research cost-effective production ways of biofuels – including the biodiesel – taking into consideration both energy and environmental aspects. As the research, which results in technological developments, it reveals a vision of the innovation-driven economy. This paper attempts to overview what is the effect of microwave field on vegetable oils. The efficiency of agriculture is significantly increased by the energy-efficient production of biodiesel from vegetable oils and then propagation of biofuels, integrating them into fuel mixes should need. During the biodiesel production technological research in the transesterification process the application of microwave energy transfer would like to contribute to realize the objectives of "Societal Challenges" topic area (such as making the local resources and the energy consumption models more sustainable, widespread utilization of energy-efficient technological developments etc.) of Horizon 2020 the EU Framework Programme for Research and Innovation.

SPOTTING THE EARTH CONNECTIONS AND SHORT CIRCUITS BETWEEN THE ELECTRIC CONDUCTORS, USING D.C. BRIDGES FOR RESISTANCE MEASURING

Authors: **I. POPA**, G.N. POPA, C.M. DINIS, S.I. DEACONU

Abstract: The paper establishes the necessary connections meant to spot the earth connections and short circuits between the conductors of a power line, using the DC bridges meant for measuring resistances between conductors at the ends of the power line. Since it is a relative method, it imposes an exact knowledge of the faulty power line setting. For values of the resistances measured between the conductors of the power line having over 1Ω at one end, the measurement will be carried out with a Wheatstone bridge, and for values below 1Ω with a Thomson bridge. In order to accurately determine the place of the fault, we measured the distances from the end of the line up to the fault and then we performed a correction calculation for this distance.

DYNAMIC INVESTIGATION OF A PAM ACTUATED VIBRATING PENDULUM

Authors: **J. SÁROSI**

Abstract: The dynamic model of the pneumatic artificial muscle (PAM) actuator introduced in this paper is a new one. In the published papers the model is assumed to be an ordinary one with one-degree-of-freedom which is described with an ordinary second order differential equation and based on that a general investigation on dynamics of PAM and its behaviour is discussed. In this paper the dynamic model of the system based on our static force model is developed. The model corresponds to a muscle of any arbitrary length, arbitrary diameter with any pressure. The investigations are carried out in MS Excel and MATLAB Simulink.

CONTROL OF INDUSTRIAL PLATE-TYPE ELECTROSTATIC PRECIPITATOR WITH THREE SECTIONS WITH MICROCONTROLLER

Authors: **G.N. POPA**, C.M. DINIS, I. POPA, S.I. DEACONU

Abstract: Plate-type electrostatic precipitators are the largest and most used industrial dust control, most applications are in the production of electricity (thermoelectric power plants). In many industrial applications, plate-type precipitators have three sections and silicon-controlled rectifier power supplies type. Although, the collection efficiency obtained by these type of precipitators are more than 95%. To improve the old industrial plate-type precipitators, the paper presents a microcontroler control of industrial plate-type electrostatic precipitator with three sections. The micocontroller is MC68HC05B6 type (Motorola). The logical diagrams of the programs are presented for the proposed solution.

CFD NUMERICAL SIMULATION OF AIR NATURAL CONVECTION OVER A HEATED CYLINDRICAL SURFACE

Authors: **M. FLORI**, L. VILCEANU

Abstract: In this study, a CFD numerical simulation is used to describe the fluid flow and heat transfer in air surrounding a heated horizontal cylinder. The model is created in 2D dimension involving a finite element solver of Navier-Stokes equations. As natural convection phenomenon is induced by a variable fluid density field with temperature rising, the Boussinesq approximation was correlated with the model.

STUDY ON SOURCES OF CHARGING LEAD ACID BATTERIES

Authors: **C.M. DINIŞ**, G.N. POPA, A. IAGĂR

Abstract: The paper presents the general characteristics of lead acid batteries and charging methods of these batteries. For charging of lead batteries with higher capacity was used a smart power source K 8012 (from Velleman). The power source allows fixing the level of the battery voltage (6V or 12V) and battery capacity (less than 4 Ah or greater than 4 Ah). In the paper experimental measurements were carried out using power source K 8012 and data acquisition card SER 10 BIT (from Conrad) for charging of a lead battery 12V/9 Ah and charging of another high capacity lead battery 12V/47Ah (390 A). Experimental measurements were carried out for the discharging the lead acid batteries using automotive lamps as electric loads.

NEW TECHNOLOGY FOR FERROUS OXIDE WASTE UTILIZATION EFFICIENCY OF REDUCTING THE MELTING IRON CUPOLA GETTING FOUNDRY

Authors: **C. MITITELU**, M. HRITAC, N. CONSTANTIN

Abstract: In the current context of this an amount of approximately 250 million tons of waste from industrial activity stored in historic dumps, in Romania there is no concern for the processing and disposal although there are sources of pollution on the environment. This work was based and evaluated the economic feasibility of

achieving a second cupola sections is designed to consume a significant amount of this waste range of approx. 15.000 - 23.000 tons/year. The multiplication of such modules production and increasing the number of cupola of each section or useful volume increase can lead to increasing the amount of waste processed annually.

ANALYSIS OF FINANCIAL AND ECONOMIC FEASIBILITY STUDY OF THE TECHNIQUE FOR IMPLEMENTATION A NEW WASTE PROCESSING TECHNOLOGY OF FERROUS OXIDE THROUGH MELTING IN CUPOLA REDUCING VALVES

Authors: **C. MITITELU**, M. HRITAC, N. CONSTANTIN, A. SEMENESCU

Abstract: Technological version proposed for the recycling of industrial activity in the form of steel slag and dust containing iron oxide through reducing valves in cupola meltdown is an efficient solution for the situation in which it is used 50% of the cargo but with roots of cast iron and steel recovered with 85% Fe and 50% of the ferrous scrap in oxidic powders moulding in auto-fuel with 20% version powdered coal. Investment recovery period is fast-1 year for a rate of return of 10% and three years for a recovery rate of 25%; In the economic analysis has taken into account the situation of using a wider range of waste products of ferrous oxide in historic dumps in order to achieve a higher consumption of these or to consume those with a potential of environmental pollution more sharply.

THE EXTERNAL REFLECTION OF MONOCHROMATIC LIGHT ON SUPERFICIAL FILMS ON SOLID SUBSTRATE

Authors: **S. JITIAN**

Abstract: Ellipsometrical analysis of external specular reflection of light on non-absorbing superficial films allows us to know factors which influence ellipsometric measurement of analyzed system. For optical non-absorbing superficial films the curves $\Delta=f(d_f)$ and $\Psi=f(d_f)$ are periodical, while the curves $\Delta=f(\Psi)$ are closed. The analysis of the periodicity of these curves allows us to correctly determine the film thickness for thicknesses greater than d_{min}. From the curve shape we can draw conclusions with respect to the domain of small errors, allowing us to correctly determine the thickness and refraction index of superficial films.

A DATAFIT APPROACH CONCERNING TO THE DATA PROCESSING

Authors: **A.D. BERDIE**, S. JITIAN, M.OSACI

Abstract: This paper presents an approach concerning to the data processing using the DataFit software tools. The processed experimental data sets are obtained by testing the same business applications implemented through three SAP UI technologies. The objective of this analysis focuses both on determining the correlations between the analyzed parameters as well as on the establishment of the analytical functions and of the dependency graphs between these parameters. The aim of this processing is to determine the dependency relations between the parameters, through the regression and correlation analysis.

SIMULATION OF THE BIMETAL CAST IN THE CASE OF MILLING ROLLS

Authors: **C.G. MIHUT**, E.M. POPA

Abstract: In the paper it's proposes, in main, to obtain of a model of numerical simulation, valid general and applicable the whole peculiars cases of bimetal casting, model with which help can be studied through the computer, the optimization possibility of flowing working condition of liquid alloy of the distribution of temperatures field, of the liquid phase and contraction during the solidification, with the minimum price (necessary reimbursement of the software & calculus equipment) in very short time etc.

ENVIRONMENTAL IMPACT OF BROWNFIELDS SITES IN HUNEDOARA AREA

Authors: **M. ARDELEAN**, E. ARDELEAN, L. VÎLCEANU, A. JOSAN

Abstract: By national economic restructuring, and global economic business climate most of the steel production capacities from Romania have been closed and completely disaffected. To clean up the polluted areas related to this disaffected production units, is a huge work has been made and shall be made, taking into account the high degree of soil contamination with various type of pollutants since 1884 when the first blast furnaces were put in operation. The evolution of former Hunedoara steel plant after restructuring and privatization is presented in this paper, and also is presented an environmental impact of brownfields sites results from disaffected of this production unit. It will also make a review of waste deposited on the company land and also proposals for reinstatement in economic circuit.

ANALYSIS THE ELECTRICAL PARAMETERS OF A MEDIUM-FREQUENCY INDUCTION FURNACE

Authors: **A. IAGĂR**, G.N.POPA, C.M.DINIŞ

Abstract: In the experiments was used an induction crucible furnace with a capacity of 7 kg molten iron (i.e. 2.5 kg aluminum). The furnace is fed by a medium-frequency (MF) static convertor of ITS2 12K20 type, with the output frequency 5...12 kHz, 600...1200 VAC rated voltage, and 20 kW rated power. Monitoring the electrical parameters of induction furnace installation was done for an aluminum charge, using a power quality analyzer CA8334. The measurement results showed that induction furnace operation causes harmonics in phase voltages, unbalance and harmonic currents in three-phase currents absorbed from the network. In the experiments was used a thermal imager, which provided thermal image of the charge and furnace crucible, at various moments of the final melting and casting aluminum. Thermal images of the crucible showed that heat losses are small. Therefore, the crucible is properly sized and built. Harmonics in the currents absorbed from the network are caused mainly by static converter, and to a lesser extent by furnace load and interaction of eddy currents induced in the charge and the magnetic field of the inductor. To reduce the negative impact of the current harmonics on the supply network is necessary the design and achievement of electrical filters (absorbing) for odd-order harmonics (5^{th}, 7^{th}, 11^{th}, 13^{th}, 17^{th}, 19^{th},23^{th}, 25^{th}).

DETERMINING THE RELIABILITY OF DACIA 1304, 1,9D VANS

Authors: A. BUDIUL BERGHIAN, **T. VASIU**

Abstract: The paper analyzes the function and malfunction of the vehicle Dacia 1304, 1,9D. The study includes Pareto chart based on data collected from observing the operation / failure of the vehicle and determining reliability was performed using specialized software Weibull ++ 6 from ReliaSoft company. Conclusions are shown in graphical form in the paper.

USING SPECIAL ADDITIONS TO PREPARATION OF THE MOULDING MIXTURE FOR CASTING STEEL PARTS OF DRIVE WHEEL TYPE

Authors: **A. JOSAN**, C. PINCA BRETOTEAN

Abstract: The paper presents the possibility of using special additions to the execution of moulding mixtures for steel castings, drive wheel type. Critical analysis of moulding technology leads to the idea that most defects appear due to using improper moulding mixture. Using a improper moulding mixture leads to penetration of steel in moulding mixture, resulting in the formation of adherences, due to inadequate refractarity of the mould and core mixtures. Using only the

unique mixture to the moulding leads to increasing consumption of new sand, respectively to the increase of price of piece. According to the dates registered in the industrial practice is necessary to use the special additions to obtain the moulding mixtures, carbonaceous materials respectively.

VALORIZATION OF POWDERY FERROUS WASTES IN SIDERURGY

Authors: C. HĂRĂU, **A. SOCALICI**, E. ARDELEAN, T. HEPUȚ

Abstract: The lack of reintroduction in the economical cycle of this pollutant flows as well as the ones deposited in dump sites or in lakes leads to the reduction of the pollution in the waste neighboring areas at water-air-soil level. One of the most important advantage of the recycling process consists of the fact that the spaces occupied by this type of waste is returned to the natural environment. The products and technologies proposed in this paper are relatively simple, do not require big investments and are easily implemented to the beneficiaries. Also, the implementation of technologies and the usage of materials proposed lead to the following benefits: intensification of siderurgical processes, recovery of useful elements from waste, raw material cost reduction, profit for processing plants and reduction of the pollution degree at water-air-soil level.

APPLICATIONS OF ENERGY HARVESTING FOR ULTRA LOW POWER TECHNOLOGY

Authors: **A. POP-VADEAN,** P. POP, C. BARZ

Abstract: Ultra-low-power (ULP) technology is enabling a wide range of new applications that harvest ambient energy in very small amounts and need little or no maintenance-self-sustaining devices that are capable of perpetual or nearly perpetual operation. These new systems, which are now appearing in industrial and consumer electronics, also promise great changes in medicine and health. Until recently, the idea of micro-scale energy harvesting, and collecting miniscule amounts of ambient energy to power electronic systems, was still visionary and limited to research proposals and laboratory experiments. Today an increasing number of systems are appearing that take advantage of light, vibrations and other forms of previously wasted environmental energy for applications where providing line power or maintaining batteries is inconvenient. In the industrial world, where sensors gather information from remote equipment and hazardous processes; in consumer electronics, where mobility and convenience are served; and in medical systems, with unique requirements for prosthetics and non-invasive monitoring, energy harvesting is rapidly expanding into new applications. This paper serves as a survey for applications of energy harvesting for ultra-low power technology based on various technical papers available in the public domain.

PRODUCTION PLANNING USING THE SPECIALIZED SOFTWARE TECHNOMATIX PLANT SIMULATION

Authors: **V. ALEXA**, S.A. RAȚIU, I. KISS

Abstract: By using the Technomatix Plant Simulation software, part of Siemens PLM package, we can model and simulate either the production systems, or the processes within thereof, for planning (designing) of a new plant, optimization of existing plants or establishment of new scenarios. Thus, the simulation aims to transform an optimal manufacturing scenario into a real one, as a result of certain analyzes and possible manufacturing optimizations, the simulation being carried out in a discreet manner, step-by-step. Finally, the production simulation leads to: productivity growth, resource optimization, reduction of production times and stocks.

CONSIDERATIONS REGARDING THE CONCEPT OF THE LEVEL OF REALITY IN THE PROCESS OF LEARNING THE TRANS-DISCIPLINARY APPROACH

Authors: **P. POP**, A. POP-VADEAN, C. BARZ

Abstract: In terms of trans-disciplinarity that meets the new global challenges require a new approach in the design, manufacture and operation of mechatronic systems. Each system consists of levels of reality that coexist matter regarded as a symbioses between substance, energy and information. On each level there is a third party included generating high quality information that leads to jump on the next level of reality mechatronics. The human being in all its hidden stylized third party to integrate with all subsystems are on different levels of reality mechatronic system ensuring operational efficiency by interfacing between man and system information.

FUNCTIONAL PERFORMANCE TESTING OF THE UNIVERSAL SUPER ABSORBING AIR FILTERS FSU 70 „AIR BY CORNELIU"

Authors: **S.A. RAŢIU**, V. ALEXA, C. BIRTOK-BĂNEASĂ, I. KISS

Abstract: This paper presents the experimental methodology to carry out functional performance tests for an air filter with a particular design of its housing, generically named Universal super absorbing FSU 70 „Air by Corneliu". The tests were carried out in the Internal Combustion Engines Laboratory, within the specialization "Road vehicles" belonging to the Faculty of Engineering Hunedoara, component of Politehnica University of Timişoara. We present some comparative values of various operating parameters of the engine fitted, in the first measurement session, with the original filter, and then with the studied filter.

USING LATERAL CORES TO CASTING OF CARBON STEEL PARTS, OF DRIVE WHEEL TYPE, IN A METALLURGICAL ENTERPRISE

Authors: **A. JOSAN**, C. PINCA BRETOTEAN, E. ARDELEAN, M. ARDELEAN

Abstract: This paper presents the possibility of obtaining castings using the lateral cores. Steps are presented for obtaining the core side a piece type drive wheel. This piece is cast carbon steel 230-450W, according to ISO 3755-95, and is part of a drive train. Using in industrial practice of such types of cores leads to significant reduction of the processing workmanship for castings, with a direct effect on the price of production.

EXPERIMENTAL RESEARCH ON THE CHARACTERISTICS OF SOFTENING AND MELTING OF IRON ORE AS THE MAJOR FACTOR OF INFLUENCE ON GAS PERMEABILITY OF BLAST FURNACE CHARGE

Authors: **E. BRĂNESCU**, A.O. BLĂJAN, N. CONSTANTIN

Abstract: It is widely accepted as a cohesive zone is directly influenced by softening and melting properties of iron ores, preparations (crowded, pellets, which represents about 90%, of the loads with metal furnace intake), or uncooked (raw ores ranked). Important results can be obtained through the study of behavior of ferrous materials at temperatures above 1000°C. Starting from research methods presented in the literature, this paper presents itself in carrying out their own laboratory experiments, conducted with the aim of analyzing the softening and melting properties of sinter iron cores.

EXPERIMENTAL RESEARCH ON THE CHARACTERISTICS OF REDUCIBILITY AND MECHANICAL STRENGTH OF FERROUS SINTERS

Authors: **E. BRĂNESCU**, A.O. BLĂJAN, N. CONSTANTIN

Abstract: Iron ores reductibility is defined usually by the speed with which it is removed the oxygen bound iron in chemical reduction reactions via a gas which passes through reducing agent loads. It depends on both the nature of oxides, as

well as a range of physical characteristics of ores. Although in practice research on industrial laboratory facilities are little used in specialties literature presents a large number of techniques and facilities. The method of research presented in detail in this paper implies: use as a reducing gas mixture CO + H2 or H2; the temperatures at which the determinations are between 800-900°C; the amount of oxygen reduction is determined by eliminated in most cases by weighing; ore sample analyzed vary from 0.2 to 1.0 kg and is generally smaller than that grit with which is inserted into the furnace; reducing active gas flow rates, as well as its speed, varies very wide limits.

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