BOOK OF ABSTRACTS

International Conference of Applied Sciences, Engineering and Mathematics

Apply the Science of Today –
Create the Opportunity of Tomorrow

5-7 May 2017
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Foreword

Dear colleagues,

The success story of the International Balkan University began in 2006. Recognizing more than 500 years of history between our nations, a group of intellectuals and academicians established the Foundation "ÜSKÜP", which then founded the International Balkan University in the heart of Balkans, in Skopje. The vision of our founders traced the road in which IBU would rise as a cultural bridge between Macedonia, Balkans and Turkey and increase the level of quality of the education in the region.

With this mission in mind, IBU has focused on educating self-confident, multidimensional, socially responsible and globally competitive individuals who will take responsibility for the development and welfare of their societies.

The International Conference on Applied Sciences, Engineering and Mathematics (IBU-ICASEM2017) intends to promote exchange of ideas, experience and knowledge between scientists and engineers whose interest is focused in the areas of applied sciences, engineering and mathematics, as well as to encourage collaborative interdisciplinary research activities.

The Conference aims to become a benchmark event by gathering academics, researchers and scholars from various countries, backgrounds and traditions who will discuss and debate on the challenges and opportunities in continuous technological development and engineering achievements.

IBU-ICASEM 2017 will offer ample opportunities for discussions among scientists, scholars, expert from industry and generally all participants in the Conference. Please, engage freely in discussions, share your ideas and build relationships among the group of international researchers, while taking the time to experience and explore Macedonia.

With an international scientific and board committee, IBU-ICASEM2017 will help in sharing knowledge, meeting people and will provide an intellectual and international friendship atmosphere. Different and important issues will be treated, analyzed and questioned in the debates organized in the conference.

As this year we are celebrating the 10th anniversary, the IBU family is motivated more than ever to give a boost to our growth and whole-heartedly accepts the challenge of becoming the most prestigious university in the region and beyond. In this regard, we have recently received a great recognition of our work, being ranked as the best university in Macedonia in the field of teaching and learning according to the Shanghai University Ranking for the academic year 2015/2016.

In the end, allow me to make a sincere call for engagement. In a time when our noble value of peace is at stake in the world, let us come together, inspire ourselves in courage and enthusiasm and, in one voice, send a joint message and promote our friendship, brotherhood and cooperation and contribute to a better tomorrow for all humanity.

Sincerely,

Prof. Dr. İsmail Kocayusufoğlu
Rector of International Balkan University

CONTENT

Plenary Lectures

Prof. Dr. Hacısalihoğlu was born in Tonya, Trabzon, Turkey in 1942. He graduated from Trabzon Teacher School in 1963. He completed his Ph.D. at Ankara University, Ankara Higher Education School at the Departments of Mathematics and Astronomy in 1966, in the field of Algebra and Geometry. In 1969, he became a Research Associate at Brown University, in 1971 he was elected into a title associated professor, and in 1979 he was elected as a full professor. After being retired in 2009, he lectured at Bilecik University, Faculty of Sciences and Literature, for 5 years more. He made short studies in Portugal, Germany, Egypt, and Malaysia. Prof. Dr. Hacısalihoğlu is author of more than 120 scientific publications, and more than 30 university textbooks. He delivered seminars in almost all of the universities in Turkey, and many Universities abroad, and still continues to do so. He was mentor of more than 100 M.Sc. and Ph. D. students from Turkey, Pakistan, Iran, and Egypt. He is currently acting as a honorary president of the Balkan Mathematicians Union. Prof. Dr. Hacısalihoğlu is married, has three children, and four grandchildren.

The mathematics of animal (behavior)

Prof. Dr. Hilmi Hacısalihoğlu

I. The mathematics of bees
II. The mathematics of spiders
III. The mathematics of fish

I. God ordained the bees to be examples to the human. 65-75 thousand bees practice a very clear mathematics program. They are equipped a beehive with a honeycomb that will serve as a beehive. The honeycombs are furnished with uniform hexagonal prisms starting from everywhere inside of the hive, the same type of prisms are built and finished. From a mathematical point of view it seems that bees choose the best possible shape of the combs cells which is optimal regarding spent material ensuring a maximum strength. The wax needed to build combs has been extruded from the worker bee glands under their abdomen. A foreign bee is not allowed to enter the hive. For the safety of the hive, guard bees located at the entrance of the hive are responsible. This discipline and diligence is also very interesting and worthy to notice. The inner arrangement of the honeycombs is also another story. At the bottom is a room for the queen, a separate second room at the top is for the eggs, a separate room at top of it for the larvae, and the last room is arranged for honey. Each bee follows the same rigor to all this unique structure. The size of the fractals is 1.
II. Spiders can be found everywhere all over the world. Spiders construct webs by producing the silk. Webs allow a spider to catch prey without having to expend energy by running it down. Thus it is an efficient method of gathering food. However, constructing the web is in itself an energetically costly process because of the large amount of protein required, in the form of silk. All male spiders are killed by their females, except those who can escape and survive immediately after mating. They do not need anything but a fixed point to construct their webs. Spider webs are used for hunting and feeding purposes, and they form the webs with same method. The webs are fractals of size 1.
III. Long-distance migrations of animals represent one of the great wonders of the natural world. In the marine environment, migratory movements sometimes reach astonishing extremes: for example, some sea turtles, salmon, sharks, and elephant seals travel distances that exceed the width of oceans before returning to their home areas to reproduce. How animals find their way during such migrations has remained a central mystery of sensory and behavioral biology.

Andrzej Kowal is a Senior Scientific Consultant in the National Science Foundation Project realized at the Institute of Nuclear Physics Polish Academy of Sciences in Kraków, Poland since 2015. Simultaneously, from 2011 he is a Senior Chemist at the Institute of Non-Ferrous Metals Department in Poznan CLAiO, Poland, and the Head of the Center for Synthesis & Characterization of Nanomaterials and visiting professor at the Faculty of Technology of University of East Sarajevo, Bosnia and Herzegovina. Since 2014 he has been the Director of the Krakow-based consulting company Elcatak.

In 1973 he obtained senior assistant position at the Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences (PAS), Krakow. After completing his PhD in chemistry in 1979 at the Institute of Physical Chemistry, PAS, Warsaw, he became an adjunct at the Institute of Catalysis and Surface Chemistry PAS, Krakow. Between 1980 – 2002, he led the Electrocatalysis Group at the Institute of Catalysis and Surface Chemistry PAS, Krakow. In 1995 Andrzej Kowal became the Head of the SPM (STM&AFM) Laboratory at the Institute of Catalysis & Surface Chemistry PAS, Krakow, which he led until 2002. From 2013 to 2014 he had an adjunct position at the Center for Microelectronics & Nanotechnology, Faculty of Mathematics & Natural Sciences, University of Rzeszow, Poland.

From 1985 until 2014 he had a very strong international collaboration and was a visiting scientist or professor in the following reputable Institutions: Fritz-Haber-Institute MPG, Berlin; Instituto de Quimica Fisica "Rocasolano" CSIC, Madrid; The University of Liverpool; Institute of Electrochemistry, IHTM, Belgrade University, Yugoslavia/Serbia; Brookhaven National Laboratory, USA; National Center for Metallurgical Research (CENIM), CSIC, Madrid; Seoul National University, South Korea and State University of New York, Binghamton, USA.

His current research interests are focused on the design, synthesis and characterization of modern nanocatalysts for Direct Ethanol Fuel Cells and Ethanol Solid Oxide Fuel Cells. He is the author and co-author of over 120 publications, 5 patents, over 1930 citations, h-factor over 20 and has presented 20 talks at international conferences including invited lectures and being chairman. He organized 6 international conferences on different topics, the last one being the Symposium on Clean Energy from Ethanol – ISCEE 2014 at the University of Rzeszow, Poland. He obtained 4 awards for best activity and scientific work from AGH-University of Sciences and Technology and Institute of Catalysis and Surface Chemistry PAS, Krakow. He also obtained an Award of the Factory "Stalprodukt" S.A. for the reduction of costs of hydrogen production. Andrzej Kowal became also an Honorary Research Fellow in the Department of Chemistry of The University of Liverpool.

Sustaining Energy from Ethanol: Design, Synthesis and Characterization of Nanocatalysts for Direct Ethanol Fuel Cells and Ethanol Solid Oxide Fuel Cells

Prof. Dr. Andrzej Kowal

Creating new, efficient, and environmentally friendly methods for transforming chemical energy into electricity is one of the most important tasks facing chemistry in the 21st century. Such transformations can be realized in fuel cells. Ethanol, with its high energy density, likely production from renewable sources and ease of storage and transportation, is almost the ideal combustible for fuel cells. The possibility of obtaining electrical energy from bio-ethanol has drawn increased attention in Direct Ethanol Fuel Cells (DEFC). There is a renewed interest in DEFC, particularly for portable electronics and mobile applications. Currently available commercial platinum nanocatalysts do not ensure complete combustion of ethanol. Two-component catalysts containing Pt and MeOx, characterized by higher selectivity, are still not

satisfactory. The most promising catalyst, which effectively oxidizes ethanol and splits the C-C bond in ethanol at room temperature, was designed, prepared and characterized in 2005-2009. This catalyst is composed of SnO_2 nanoparticles bonded with PtRh nanoparticles.

The Ethanol Solid Oxide Fuel Cell (ESOFC) has been realized as a device composed of an external reformer and a classical solid oxide fuel cell (SOFC). Nano-oxides such as SnO_2, SnO_2/Sb, CeO_2 and TiO_2 were prepared. The physicochemical properties of synthesized oxides were evaluated using DLS, XRD and HRTEM. After oxide deposition on nickel foam the catalytic systems (oxide/Ni) were tested in the external reformer and SOFC.

Mathematics, education and application

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Mathematics, education and application

Streamline Topologies of Axisymmetric Flow near Non-Simple Degenerate Points Using Normal Forms

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ABSTRACT

In this paper we study streamline patterns of axisymmetric flow and their bifurcations in two-dimensional incompressible fluid near non-simple degenerate critical points. A normal form transformation is used to simplify the differential equations of a Hamiltonian system that describes the streamlines. Bifurcations in the flow occur when parameters take certain degenerate values. When the degenerate configuration is perturbed slightly, an unfolding of the system is obtained. From this, we give a complete description of the bifurcations up to codimension two. A special flow patterns are found that critical points in a triangle which was seen only near the non-simple degenerate critical point.

Keywords: ***Normal Form Theory, Bifurcation, Divergence Free-Vector Field***

ACKNOWLEDGEMENTS: Research supported by the TUBITAK under Grant No: 114F525

Solutions of IVPs for a 2nd order Differential Equations in Intuitionistic Fuzzy Environment

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ABSTRACT

The fuzzy set theory was firstly introduced by L. Zadeh in 1965. Since for many reasons, vagueness or uncertainty is inevitable in most practices, he reminded us that things are not always black or white. To handle such situations he introduced a function $\mu(x) : X \rightarrow [0, 1]$, called membership function, instead of characteristic function for the classical set concept. Later to model the real world events which consist of uncertainty, fuzzy differential equations were investigated by the researchers. The term "fuzzy differential equation" was firstly coined in 1978 by Kandel and Byatt. Recently we have investigated the solution of second order initial value problems on the (intuitionistic) fuzzy environments by using Zadeh's Extension Principle with the heaviside step function approach and Generalized differentiability concept.

Keywords: ***2nd order differential equations; Intuitionistic fuzzy environment***

Rough sets and on Decision-Making Methods

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ABSTRACT

Many fields deal daily with the uncertain data that may not be successfully modeled bye the classical mathematics. The volume and complexity of the collected data in our modern society is growing rapidly. There often exist various types of uncertainties in those date related to complex problems. In order to describe and extract the useful information hidden in uncertain data, researchers in mathematics, computer science an related areas have proposed a number of theories such as probability theory, fuzzy set theory, intuitionistic fuzzy set theory, rough set theory. Molodstov, introduce the concept of soft sets that can be seen as a new mathematical theory for dealing with uncertainty. The soft theory has been applied to many different fields with great success. Chen at al. proposed a new definition of soft set parametrization reduction, and compared it with the related concept of attributes reduction in rough set theory in this study, we investigate a connection between two mathematical approaches to vagueness; rough sets and soft sets. Moreover, applications of rough sets on decision-making method are studied.

Keywords: Soft sets, rough sets, rough soft sets, decision-making theory

High Order Finite Difference Method for Burgers' Equation

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ABSTRACT

The Burgers' equation

$$u_t + uu_x - \nu u_{xx} = 0$$

is one of a few well-known non-linear partial differential equations which can be solved analytically for the restricted set of initial conditions. In the equation, ν is the viscosity parameter. Burgers' equation is the simplest partial differential equation combining both nonlinear propagation effects and diffusive effects. In this study, the Burgers' equation will be solved numerically using higher accurate finite difference method for time-space discretization. Then the accuracy of the presented method is demonstrated for the small values of viscosity parameter ν for the test problem. The numerical results are found to be in good agreement with the exact solutions.

Keywords: ***Burgers' equation; finite difference method; viscosity parameter***

A remark on a variable-coefficient Bernoulli equation based on auxiliary -equation method for nonlinear physical systems

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ABSTRACT

It is well recognized that in auxiliary equation methods, the exact solutions of different types of auxiliary equations may produce new types of exact travelling wave solutions to nonlinear partial differential equations in hand. In this study, we extend the class of auxiliary equations of classical Bernoulli equation which considered by various researchers in the literature to a variable-coefficient Bernoulli type equation. The proposed variable-coefficient Bernoulli type auxiliary equation produces many new solutions comparing to classical Bernoulli equation which produce two solutions only. Consequently, we introduce new exact travelling wave solutions of some physical systems in terms of these new solutions of the variable-coefficient Bernoulli type equation.

Keywords: ***The auxiliary equation; b-equation; Bernoulli equation; travelling wave solutions; nonlinear partial differential equations.***

B-Darboux Frame of a Surface

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ABSTRACT

In this paper, we introduce a new frame on a surface, called as B-Darboux frame. It is well known that we derive the parallel transport frame from the Frenet frame along a space curve. Analogously, we derive the B-Darboux frame from the Darboux frame on a surface. Then by using the new frame, we also reparametrized the parallel surfaces. Finally, some examples are constructed and plotted.

Keywords: ***Bishop frame; Darboux frame; Parallel surfaces.***

Local *T*3-Objects *in* the Category of Cauchy Spaces

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ABSTRACT

There are various generalization of the usual topological *T*3 - axioms to topological categories defined in [1] and [2]. [2] is shown that they lead to different *T*3 concepts, in general. In this paper, an explicit characterizations of each of the separation properties *T*3 at a point *p* is given in the topological category of Cauchy spaces [3]. Moreover, specific relationships that arise among the various *Ti*, *i* = 0*;* 1*;* 2*;* 3, *PreT*2*;* and *T*2 structures at *p* are examined in this category.

Key Words: ***Topological category, Cauchy space, Cauchy map, separation,***

ACKNOWLEDGEMENTS. This research was supported by the Erciyes University Scientific Research Projects Coordination Unit. (BAPSİS) under Grant No: FDK-2017-7175.

Topology of Divergence Free-Vector Fields Close To the Free Surface

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ABSTRACT

The aim of this paper is to find the streamline patterns and their bifurcations in a 2D incompressible fluid flow near a non-simple degenerate critical point close to a free surface. It will be shown that degenerate flow patterns and their bifurcations associated with the non-simple degenerate critical point near a stationary wall can also be seen near a free surface under certain conditions. The theory is applied to the pattern found numerically in the studies of Stokes flow in a roll coater. Also, a new degenerate critical point is found on the free surface. Their bifurcations give rise to a variety of flow patterns which have not been observed previously either theoretically or numerically.

Keywords: ***Normal Form Theory, Bifurcation, Free Surface***

ACKNOWLEDGEMENTS. Research supported by the TUBITAK under Grant No: 114F525

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Mathematics, education and application

Three New Sequence Spaces Derived By the Composition of Binomial Matrix and Generalized Difference Matrix

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ABSTRACT

To define new sequence spaces, the Euler matrix was first motivated by Altay, Başar and Mursaleen. They defined the sequence spaces e_0^r, e_c^r and e_∞^r, where the Euler matrix of order r is defined by

$$e_{nk}^r = \begin{cases} \binom{n}{k}(1-r)^{n-k}r^k & , \quad 0 \le k \le n \\ 0 & , \quad k > n \end{cases}$$

for all $n, k \in \mathbb{N}$ and $0 < r < 1$. Also, by using the Euler and difference matrices, Altay and Polat defined the Euler difference sequence spaces $e_0^r(\Delta), e^r(\Delta)$ and $e_\infty^r(\Delta)$ and improved Altay, Başar and Mursaleen's works, where $\Delta = (\delta_{nk})$ is difference matrix [4]. Recently, Bişgin has constructed the binomial sequence spaces $b_0^{r,s}, b_c^{r,s}$ and $b_\infty^{r,s}$ and generalized Altay, Başar and Mursaleen's works, where Binomial matrix is defined by

$$b_{nk}^{r,s} = \begin{cases} \dfrac{1}{(s+r)^n}\binom{n}{k}s^{n-k}r^k & , \quad 0 \le k \le n \\ 0 & , \quad k > n \end{cases}$$

for all $n, k \in \mathbb{N}$. Quite recently, Sönmez has defined the binomial difference sequence spaces $b_0^{r,s}(\Delta), b_c^{r,s}(\Delta)$ and $b_\infty^{r,s}(\Delta)$ and improved Bişgin's works.

In this work, we define new sequence spaces $b_0^{r,s}(G), b^{r,s}(G)$ and $b_\infty^{r,s}(G)$ which generalizes the spaces $b_0^{r,s}(\Delta), b_c^{r,s}(\Delta)$ and $b_\infty^{r,s}(\Delta)$, where G is generalized difference matrix. Moreover, we investigate some inclusion relations and give Schauder basis of those spaces. Finally, we obtain $\alpha-, \beta-$ and $\gamma-$ duals and characterize some matrix classes of those spaces.

Keywords: ***Matrix domain of a sequence space; Schauder basis; β- and γ-duals; Matrix transformations***

On Baer Subplanes of the Left Hall Plane of Order 9

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ABSTRACT

In this study, we give an algorithm (implemented in C#) to determine Baer subplanes of the projective plane plane of order 9 coordinatized by elements of a left nearfield of order 9 and classify these subplanes.

Keywords: ***Near field; Projective plane; Baer subplane;***

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Mathematics, education and application

On New Sequence Spaces Obtained By the Double Band Matrix

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ABSTRACT

We define the sequence spaces ℓ_{p}($\tilde{T}$) as the set of sequences whose $\tilde{T}$ - transforms are in the ℓ_{∞} and ℓ_{p} where 1≤p≤∞. We also give some inclusion relations and its topological properties. Also, we define the alpha-, beta- and gamma- duals of the space ℓ_{p}($\tilde{T}$). Finally, we give some matrix mappings.

Keywords: ***Sequence spaces; Matrix transformations; alpha-, beta- and gamma- duals***

On An Algorithm For Constructing (K,2)-Arcs In Hall Plane

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ABSTRACT

We present an algorithm for constructing (k,2)-arcs in Hall Plane and apply the algorithm (implemented in C#) to determine and classify them.

Keywords: ***Hall Plane; Projective plane; arcs***

Some Notes on the Sequence Spaces Generated By Triple Band Matrix

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ABSTRACT

By λ, we denote any of the classical spaces ℓ_∞, c, c_0, and ℓ_p of bounded, convergent, null, and absolutely p-summable sequences, respectively, and let $\lambda(B)$ also be the domain of the triple band matrix $B(r, s, t)$ in the sequence space λ, where $1 < p < \infty$ and $B=\{b_{nk}(r,s,t)\}$ is defined by

$$b_{nk}(r,s,t)=\begin{cases} r, & (n=k),\\ s, & (n=k+1),\\ t, & (n=k+2),\\ 0, & \text{otherwise,}\end{cases}$$

for all $n; k \in \mathbb{N}$ and $r,s,t \in \mathbb{R}\setminus\{0\}$.

We touch on a point that $B(r,s,0)=B(r,s)$, $B(1,-2,1)=\Delta^{(2)}$ and $B(1,-1,0)=\Delta^{(1)}$. So, the results related to the matrix domain of the triple band matrix $B(r,s,t)$ are more general and more comprehensive than the consequences on the matrix domain of $B(r,s)$, $\Delta^{(2)}$, and $\Delta^{(1)}$, and include them.

In this study, we introduce the sequence space $\lambda(B)$ and determine the β- and γ-duals of those space. Furthermore, we give the Schauder bases for the spaces $c(B)$, $c_0(B)$, and $\ell_p(B)$ and examine some topological properties of the spaces $c(B)$, $c_0(B)$, and $\ell_p(B)$.

Keywords: ***Matrix domain of a sequence space; Schauder basis; β- and γ-duals; Matrix transformations***

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Mathematics, education and application

Pullback Cat[1] Objects in Modified Categories of Interest

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ABSTRACT

In this study we define pullback Cat[1] object in a modified category of interest. This is the Cat[1] objects that obtained by a pullback diagram with extra structures on certain arrows of the corresponding diagram. Remark that, these are not the pullback objects in the category of Cat[1] objects of modified categories of interest. This structure unifies many corresponding results for the case of groups, commutative algebras, dialgebras, Leibniz algebras, etc.

It is proven that the category of crossed modules is equivalent to the category of Cat[1] objects of modified categories of interest. Under the light of this property: the main idea of this study comes from the pullback crossed modules of groups that are defined by Brown and Wensley (1995).

Keywords: ***Modified category of interest, Cat1 object.***

A New Construction of the Fractal Structures in Galilean Plane

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ABSTRACT

A fractal is a fascinating mathematical set which is made up smaller copies of itself and fractals are generated by iterated function systems (IFS). Each IFS is a collection of transformations. Applying this transformations to a set using recursive algorithm method with computer programming it is obtained a fractal set. Two important features of fractals are self-similarity and fractal dimension. Until now, fractals have been formed by Euclidean geometry. At this point we claim that it is metric properties that shape an object. From this point of view, in this work we study geometrical concept of the fractal structures in Galilean plane and Galilean space. We obtain some known fractal structures such as Sierpinski carpet in Galilean plane using the similar idea in Euclidean plane. We called them Sierpinski-type fractals and compare them with the Euclidean ones. Furthermore, we obtain Galilean self-similarity system.

Keywords: ***Fractal, Galilean transformation, iterated function system.***

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Mathematics, education and application

Rotation Minimizing Frame and its Applications in E^3

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ABSTRACT

In this paper, it is showed conditions that any frame is rotation minimizing frame (RMF) using spherical curves. It have also expressed how the Bishop frames can be obtained from frames of any curve on surface and on space. The necessary and sufficient conditions are given. Then, it is investigated whether obtained frames are rotation minimizing frame (RMF) or not. Theorems, warnings and conclusions are expressed. The examined situations are shown over the examples.

Keywords: ***Spherical curve; Bishop Frame; Rotation minimizing frame (RMF)***

On the parallel ruled surfaces with q-frame in Euclidean 3-space

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ABSTRACT

In this paper, the parallel ruled surfaces with q-frame are introduced in Euclidean 3-space. Then some characteristic properties such as developability, striction point and distribution parameter of the parallel ruled surfaces with q-frame are given in Euclidean 3-space.

Keywords: ***Parallel ruled surface, q-frame, surfaces.***

Isotropic Smarandache curves in the complex space C^4

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ABSTRACT

In this work, we study isotropic Smarandache curves according to the Cartan frame in the complex 4-space. We define isotropic Smarandache curves in the complex space, as curves whose position vectors are composed by the Cartan frame vectors on another isotropic curves. Then we give some differential geometric properties of isotropic Smarandache curves such as the e_1e_4-isotropic Smarandache curves, the e_2e_4-isotropic Smarandache curves and the $e_1e_3e_4$-isotropic Smarandache curves in the complex space C^4

Keywords: ***Complex space C4, isotropic Smarandache curves, isotropic cubic.***

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Mathematics, education and application

Cat[1] Leibniz - Rinehart Algebras and Related Structures

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ABSTRACT

Leibniz - Rinehart algebras can be seen as an algebraic counterpart of Leibniz algebroids. It is clear that any Lie algebroid morphism is already a Leibniz algebroid morphism. Thus, one can obtain that the category of Lie algebroids is the full sub category of the category of Leibniz algebroids. This yields us to say that a Leibniz - Rinehart algebra is the generalization of a Lie - Rinehart algebra.

In this oral presentation, we will talk about Cat[1] objects and some related (even categorically equivalent) structures for the category of Leibniz - Rinehart algebras.

Keywords: ***Leibniz-Rinehart algebra, crossed module, Cat1 Leibniz - Rinehart algebra***

Pseudo-Finsler Eikonal Equations

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ABSTRACT

In this study, we generalize pseudo-Finsler map by introducing the concept of semi-Riemannian map. After that we find pseudo-Finsler eikonal equation using pseudo-Finsler map. Then we give the relations between some differential operators defined by conformally transformation in this space.

Keywords: ***pseudo-Finsler manifold; eikonal equation; conformally transformation.***

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Mathematics, education and application

Some classification of translation surfaces in pseudo-Galilean space G_1^3

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ABSTRACT

In this paper, we study translation surfaces in pseudo-Galilean 3-space G_3^1 by using the Laplace operator Δ. Also, we investigate coordinate finite type translation surfaces and provide some examples of translation surfaces in G_3^1.

Keywords: ***Pseudo-Galilean space, finite type, translation surface***

Spacelike Directional Tubular Surfaces

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ABSTRACT

In this paper, we introduce a new reparametrization of spacelike tubular surfaces. We first define a new adapted frame along a space curve, and denote this, the q-frame in Minkowski space. We then reveal the relationship between the Frenet frame and the q-frame. We give a parametric representation of a spacelike directional tubular surface using the q-frame.

Keywords: ***Frenet frame; spacelike tube surface; tube; adapted frame.***

On The Circular Inversions in Alpha Plane

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ABSTRACT

Alpha plane geometry is a non-Euclidean geometry, and also a Minkowski geometry. Here, the linear structure is the same as the Euclidean one but distance is not uniform in all directions. That is, α-plane is almost the same as Euclidean plane since the points are the same, the lines are the same, and the angles are measured in the same way. Since the α-plane geometry has a different distance function it seems interesting to study the α-analog of the topics that include the concepts of distance in the Euclidean geometry.

One of the concepts which include notation of distance is an inversion. There are two kind of transformations which are their own inverses. However, a new transformation also is its own inverse. This transformation is an inversion in a circle.

Since inversion has attracted the attention of scientist from past to present. So there are a lot of study about inversion. Many scientist studied and also are studying different side of this concept. For example, there are some articles which was investigated the inversions with respect to the central conics in real Euclidean plane. There are some detailed articles about the inversions with respect to taxicab circle.

In this representation, the author introduce inversion which is also valid in the alpha plane geometry, and give some properties such as cross ratio, harmonic conjugates with respect to inversion in the alpha plane geometry.

Keywords: ***Alpha plane; Circular Inversion; Cross ratio; Harmonic conjugates***

Local T_1 Pseudo-Semi Metric Spaces

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ABSTRACT

It is well-known that the category **MET,** of metric spaces and non-expansive maps, is not stable under the formation of initial structures, in particular, of infinite products. As a remedy to this defect, in 1990, Adámek and Reiterman defined extended metric spaces, where an metric is allowed to attain the value infinity. By using initial and discrete structures, in 1991, Baran introduced local T_1-axiom of topology to a topological category. One of the uses of local T_1 separation property is to define the notion of strong closedness in set-based topological categories which is used in the notions of compactness, regular, completely regular, and normal objects. One of the other uses of local T_1 property is to define various forms of local regular and local normal objects in arbitrary topological categories. The aim of this paper is to characterize each of local T_1 extended pseudo-semi metric spaces and T_1 extended pseudo-semi metric spaces and investigate the relationships between them.

Keywords: ***Topological category, local T1 objects, extended pseudo-semi metric spaces.***

ACKNOWLEDGEMENTS. This research was supported by the Erciyes University Scientific Research Projects Coordination Unit. (BAPSİS) under Grant No: FDK-2017-7175.

Quasi-similarity to L-weakly and M-weakly compact operators

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ABSTRACT

L-weakly compact and M-weakly compact operators are subclasses of the weakly compact operators defined between Banach lattices. In this study, we present some results about operators quasi-similar to these operators. Firstly, we obtain that L-weakly and M-weakly compactness is not a property preserved by quasi-similarity as compactness. Secondly, we deal with invariant subspace problem. Let T be an L-weakly compact operator defined on a Banach lattice E without order continuous norm. We prove that the bounded operator S defined on a Banach space X has a non-trivial closed invariant subspace if there exists an operator in the commutant of S which is quasi-similar to T. Also, some similar and relevant results can be obtained for M-weakly compact operators because of the reason that these operators are dual of each other. Additively, these results are extended to a larger classes of operators called super right-commutant.

Keywords: ***Invariant subspace, L-weakly compact operator, M-weakly compact operator, Quasi-similarity***

*T*3-Objects *in* the Category of Cauchy Spaces

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ABSTRACT

In this paper, an explicit characterizations of the generalized separation properties *T*3 is given in the topological category of Cauchy spaces. Moreover, specific relationships that arise among the various *Ti*, *i* = 0*;* 1*;* 2*;* 3, *PreT*2*;* and *T*2 structures at *p* and the generalized separation properties are examined in the category of Cauchy spaces. Finally, we investigate the relationships between the generalized separation properties and the separation properties at a point *p* in the category of Cauchy spaces.

Key Words: ***Topological category, Cauchy space, Cauchy map, separation,***

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Mathematics, education and application

Some continuity results for the Stockwell transform on distribution spaces

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ABSTRACT

The Stockwell transform was proposed by Stockwell and his coworkers in 1996. We consider and analyze the Stockwell transform and its transpose on the test function space $S_0(R)$ and $S(R\times R^n\setminus\{0\})$ respectively, and prove continuity theorems on these spaces. We also give extended reconstruction formula and some Parseval relations. We use the obtained results to extend the definition of the Stockwell transform on the space $S_0'(R)$ of Lizorkin distributions.

Keywords: ***Stockwell transform; test function space; Lizorkin distributions***

On the second regularized trace of a differential operator with bounded operator coefficient

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ABSTRACT

In this work, we study the spectrum of a fourth order differential operator with bounded operator coefficients defined on a finite interval and give a trace formula to this operator.

Keywords: ***Hilbert space, adjoint operator, kernel operator, spectrum and resolvent***

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Mathematics, education and application

Split Quaternionic Version of Hamiltonian Mechanics

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ABSTRACT

The geometrical applications of Split quaternions is considered. The new representations of the basis units of Split quaternions having Hamilton mechanics is presented. Quaternionic and Coquaternionic (split analoque of quaternions) extensions of Hamilton mechanics are introduced and are shown to offer a unifying framework for quantum mechanics. This study leads to the possibility of employing algebric techniques of quaternions and coquaternions to absorbing in quantum mechanics. At the end of the study the founded equations are compared with the hamilton energy equations generally known and the hamilton energy equations obtained in minkowski space. Finally, the physical evaluation of the hamilton energy equations obtained in this study is given.

Keywords: ***Quaternion, Split Quaternion, Hamilton Mechanical System, Hamilton Energy Equations, Minkowski Space***

Exact Solutions and Conservation Laws of the CH-KP equation

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ABSTRACT

In the present work, we dealt with exact solutions and conservation laws of the 2+1 dimensional CH-KP equation. We applied the generalized Kudryashov method to obtain travelling wave solutions of given equation. The obtained solutions are included the hyperbolic functions.

Furthermore By utilizing the multiplier approach, we obtained six different multipliers of the form $Q(x, t, u)$, and thus, six local conserved vectors were obtained in each case.

Keywords: ***Generalized Kudryashov method, Nonlinear Partial Differential Equation, Trawelling Wave Solution, Conservation Laws, Multiplier Approach***

Lagrangian Energy Systems on Supermanifolds

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ABSTRACT

The aim of this article is to improve Lagrangian energy equations for the super jet bundles using supermanifolds. The super coordinates on the super bundle structure of supermanifolds have been given for body and soul and also even and odd dimensions. For given super bundle structures, all super fundamental geometrical properties have been investigated in super Lagrangian energy equations and applications to super bundle structures. The improved super lagrangian energy equations have applied to the presented example in order to test its performance. Moreover, we have presented a new concept of velocity and time dimensions for energy movement equations. Results showed that body and soul Lagrangian values are opposed to even and odd Hamiltonian values in m+n dimensions. Finally, this study showed a physical application and interpretation of super velocity and super time dimensions in super Lagrangian energy equations for given example.

Keywords:

On a new ring structure

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ABSTRACT

Molodtsov introduced the theory of soft sets, which can be seen as an effective mathematical tool to deal with uncertainties, since it is free from the difficulties that the usual theoretical approaches have troubled. Soft set theory has continued to experience tremendous growth in the mean of algebraic structures since Aktaş and Çağman defined and studied soft groups, soft subgroups, normal soft subgroups, soft homomorphisms, adopting the definition of soft sets. The authors introduced two new operations on soft sets, called inverse production and characteristic production depending on the relation forms of soft sets and obtained two isomorphic abelian groups called "the inverse group of soft sets" and "the characteristic group of soft sets". In this study, we redefine the operations inverse and characteristic products of soft sets without using relation forms of soft sets. This leads to simplicity and brevity. Using the operations inverse product, soft intersection and characteristic product, soft union, we construct two isomorphic ring structures, whose elements are soft sets. Also, we give two methods for transferring a soft set to letters and letters to a soft set, called soft cipher method (scm) and letter-soft method (lsm), respectively.

Keywords: ***Soft sets, group structure, ring structure***

ACKNOWLEDGEMENTS. Research supported by the T.C.ERCİYES UNIVERSITY Scientific Research Projects Coordination Unit. (BAPSİS) under Grant No: FYL-2016-6259

Lagrangian Energy Systems for Super Helix on Supermanifolds

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ASTRACT

The aim of this article is to improve Lagrangian energy equation for super helix on super manifolds with super jet bundles. The super helix coordinates on the super bundle structure of supermanifolds have been given for body and soul part and also even and odd dimensions. For given super bundle structures, super fundamental geometrical properties have been investigated in super Lagrangian energy equations and applications to super bundle structures. We have presented a new concept of velocity and time dimensions for energy movement equations. Finally, this study showed a physical application and interpretation of super velocity and super time dimensions in super Lagrangian energy equations for given example.

Keywords: ***Supermanifold, Superbundle, Super Helix, Lagrangian Energy, Lagrangian energy equations***

Some New Inequalities for Harmonic Mathieu Series

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ABSTRACT

In this paper we derive some new estimates for some class of harmonic Mathieu series, using their integral representations and well known results for the harmonic numbers and the polygamma functions.

Keywords: ***harmonic Mathieu series, psi function, polygamma functions, inequalities***

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Mathematics, education and application

Stokes Flow in A Z-Shaped Domains

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ABSTRACT

The aim of this paper is to consider Stokes flow in Z-shaped domains. A boundary value problem is formulated for the case of Stokes flow, which is solved analytically, stream function (ψ) as an infinite series of Eigen functions. Possible flow transformation mechanisms have been identified. The control space diagram is constructed for exhibiting the mechanism by which new dividing streamlines are obtained in the Z-shaped cavity. The control space diagram, and the flow bifurcations in the Z-shaped cavity are explained in two categories. In the first case we consider flow bifurcations away from the boundaries and in the second case we consider those near the reentrant corner of the Z-shaped cavity. It is shown that three heteroclinic connections from three on-wall separation points merge at an in-flow saddle point to produce two separation bubbles with opposite rotations which occur only near a non-simple degenerate critical point. This type of bifurcation can be seen in the Z-shaped cavity when the lids moving in the same directions.

Keywords: ***L-shaped cavity, Flow structure, Bifurcations, FEM, Stabilization.***

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Further Properties of Completely Delta-b-irresolute Functions

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ABSTRACT

Of course, continuous functions is important in engineering as well as general topology. Besides, the notion of irresolute functions is weaker than the notion of continuous functions. In this talk, we state that some new properties and characterizations of completely delta-b-irresolute functions.

Keywords: ***Delta-b-open sets, completely delta-b-irresolute functions***

AHP – Topsis Model as A Mathematical Support In The Selection Of Project From Aspect Of Mobility

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ABSTRACT

The multi-criteria decision support systems are used in various fields of human activities. In each alternative of the multi-criteria decision making, the problem could be represented as a set of properties or constraints. Today the modern societies demand a high degree of mobility in the process of planning and construction, therefore it is necessary to examine a large number of different criterions in the decisions. The mobility is an important feature of life and plays a significant role in people's activities. This paper, presents a model for the selection of projects of the housing complexes, which can be integrated in the urban core of the cities and in such case that encourages frequency of activities and events of employed in IT sector, while increases the quality of life in city. The Comparison of predetermined criteria and determination of their weight has been done with AHP method, and the best alternative is selected with TOPSIS method. The aim of this study is to highlight the importance of using of the multi-criteria optimization in the moments of making complex and important decisions by taking into account the number of criteria that needs to be considered in the course of construction practice.

Keywords: ***AHP method, comparison matrix, TOPSIS method, eigenvector.***

Protein Engineering

Perspectives on Molecular Dynamics Simulations & Free Energy Calculations for Biomolecular Systems

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ABSTRACT

Molecular dynamics (MD) simulations can provide detailed insights into the dynamics of biomolecular systems, which involve transitions between various conformational states due to atomic motions. The main problem of standard MD simulation is the time and size scale limitations of the approach in studying slow conformational motions of complex molecular systems. Therefore, the large time and size scale (bio) physical and chemical phenomena will indeed require new statistical and computational approaches in order to be studied efficiently.

In this presentation, we discuss different approaches that have been suggested for enhancing the search and sampling efficiency of MD simulations. In particular, we will focus on the swarm particle-like molecular dynamics (SPMD) approach to enhance conformational sampling in computer simulations of peptide/protein folding problem.

Furthermore, free energy calculations using MD simulations allow computing binding free energies of protein complexes, such as, protein-ligand and protein-protein complexes. In this study, we focus on recent advanced methodological studies in application of MD simulations and free energy calculations in biomolecular complexes, in particular, the role they will play in enabling rational drug design technologies.

Keywords: Protein folding; enhanced sampling; molecular dynamics; swarm particle intelligence; free energy; drug design

Functional Classification of Proteins Having Role in Cellular Response to Nanoparticles: A Proteome-Wide and Bioinformatics Approach

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ABSTRACT

High-throughput functional classification of proteins or genes coming from the proteomics and transcriptomics studies is an important issue to understand cellular process of various types of diseases and conditions. In this study, we have analyzed high-throughput proteomics data of nanoparticle induced fibroblast cells using bioinformatics tools to understand cellular responses. Effects of nanoscale ZnO on human dermal fibroblast cells were studied by label-free protein quantitation to identify cellular response to particles. In experiment, 15 µg/ml nano-ZnO for 24 hours was applied to cell culture. After cell collection, protein extraction and digestion, proteome profile was determined by LC-ESI-qTOF (Waters, USA) and quantified by Progenesis LC-MS software. Proteomics data were analyzed by PANTHER server for functional classification of proteins having roles in biological process, molecular function, cellular component and pathway. Proteomics profiling reveals that due to oxidative stress, production of antioxidant and detoxification proteins by completely activation of Nrf-2/ARE pathway. Some up-regulated proteins were found related with DNA repair process, pro-inflammatory process, glycolysis and pro-apoptotic process when compared with control cells. Besides this, proteins responsible from cell proliferation, survival and anti-apoptotic process were found to be down-regulated. These outcomes of this work will help to further studies for elimination of side effects of nanoparticles and makes them more biocompatible.

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Keywords*: Label-free proteomics; Protein expression; Protein classification, Cellular response*

Industrial potential of a new Bacillus subtilis (EU07) besides its biocontrol property

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ABSTRACT

Bacillus subtilis produces enzymes such as proteases and amylase and widely used as a broad spectrum antibiotic producers. The proton binding properties of its surface plays a role in the degradation. Moreover, commercial applications of B. subtilis include cleaning agents in detergents, in de-haring and batting in the leather and paper industry are known well. In the production of special Japanese and Korean cuisine, starch modification, the de-sizing of textiles, and other specialized chemicals this bacteria is commonly used. Our B. subtilis isolate (Eu07) was investigated using proteomics and advanced molecular microbiology techniques. Production of proteases, iturin A, B, amylase, celulase and 1,3 β Glucanase enzymes has been proved. We showed that Bacillus subtilis (Eu07) has also potential in purpose of industrial and pharmological process after cloning of genes encoding enzymes, besides its biocontrol property to plant diseases.

Keywords: ***Bacillus subtilis; omics science; enzyme production,***

Industrial Engineering

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Industrial Engineering

Fuzzy-Sliding Mode Control of a Quarter Bus Model with an Air Suspension System

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ABSTRACT

This paper presents the fuzzy-sliding mode control of a bus suspension system with an air spring. The equivalent physical model of the air spring and mathematical model of the quarter bus model are obtained and the model parameters are given. Then, the sliding mode control and the fuzzy logic control (multi-input-single-output) are chosen to suppress undesirable vibration. The vertical displacement of the vehicle body and its derivative are the membership functions for the input variables and the slope constant of the sliding surface for sliding mode control is the membership functions for the output variable. In order to investigate the performance of Fuzzy-Sliding Mode controller on the bus suspension system, the time responses of the vehicle body are presented. Finally, numerical results of the model indicate that the proposed Fuzzy-Sliding Mode Control method improves the ride comfort of the passengers.

Keywords: ***bus suspension system; air suspension; fuzzy-sliding mode control; active suspension system; vibration control.***

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Industrial Engineering

A Comparative Analysis of Forecasting Daily Stock Market

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ABSTRACT

Stock market data is known for its high fluctuations and difficulty to make predictions. In this study, we have compared three models according to data analytical approach and evaluated the results of accuracy, sensitivity and specificity. Apart from, ARIMA and Artificial Neural Network forecasting methods we, have evaluated Wavelet Neural Network model to see how efficient it is compared to the above-mentioned models on data analytics basis. In three of the models we will use only the data itself with no other outputs, however, in Wavelet Neural Network model we will be decomposing the data set in order to form more than one output containing extracted detailed and approximate data of the signal itself. The comparison analysis is evaluated on stock market value of ten-year daily interval from 2007 to 2017.

Keywords: ***ARIMA, Artificial Neural Network, Wavelet Neural Network, Forecasting, Stock Market.***

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Industrial Engineering

Vibration Control of a Bus Suspension System with an Air Spring Using PD Type Fuzzy Logic Controller

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ABSTRACT

In this study, a proportional-derivative (PD) type fuzzy logic controller (FLC) is presented for reducing the vibration levels of vehicle body. The error and its derivative are chosen as the input variables and the control signal is the output variable of the PD type FLC. Then, a fuzzy associative memory (FAM) is identified by these variables. The proposed control is applied to a bus suspension system to demonstrate the efficiency of the controller. Unlike the conventional springs with constant stiffness, a bus suspension system which has an air spring with variable spring coefficient is used. The performance of the developed controller (active suspension system) has been discussed and compared with the passive suspension system. The numerical results indicate that the PD type FLC decreases undesirable vibration of the vehicle body and improves the ride comfort.

Keywords: ***PD type fuzzy control; bus suspension system; air spring; active suspension system; vibration control.***

Electrical and electronics engineering

Torque Ripple Analysis of Permanent Magnet Motor

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ABSTRACT

The demand for Permanent Magnet (PM) Motors in industrial applications is increasing because of their high efficiency and power density. But, PM motors have torque ripple which causes vibrations and noises, which deteriorates their performance. As a consequence, it is important to apply accurate methods for calculation and assessment both the electromagnetic toque and torque ripple. In the paper, torques assessment of PM Motor, using magnetic field analysis (FEA) is presented. The particular emphasis is put on torque pulsations and cogging torque.

There are mainly two contributions to the torque ripple in PM motors. The first one is cogging torque which arises from the interaction of permanent magnets with stator teeth. The second contribution is torque pulsation caused due to motor power supply and control device.

The knowledge of static electromagnetic and cogging torque is an important issue for performance analysis of electric motors. For torque calculations the electromagnetic field theory is applied.

The particular interest in investigation of the PM motor is certainly a prediction and an assessment of torque pulsations. Introducing in the simulations the algorithms of the control device, different graphs are derived and analyzed.

In the paper, there will be presented full torque ripple analysis of the PM motor.

Keywords: ***Permanent Magnet Motor; Magnetic Field Analysis (FEA); Electromagnetic torque; Cogging torque; Torque ripple.***

A Comparative Study of Theoretical and Experimental Results for Estimating a Solar PV Module Temperature

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ABSTRACT

The performance of a solar photovoltaic (PV) module is directly affected by the operating cell temperature. This effect is mainly reflected in both current-voltage output, and also power output. Thus, for evaluating long term performance of the PV systems, the variation and characterization of the cell temperature is needed. Therefore, in this study, the comparative study of different methods employed to estimate the operating cell temperature has been analyzed and discussed. Both theoretical and experimental methods proposed by many authors have been evaluated via local environmental conditions including ambient temperature, wind speed and global solar radiation. In addition, these approaches have been compared with the actual measured data performed on a polycrystalline PV module in 10th of November, 2015. As a result of the analysis, all estimation methods have generally showed a similar tendency during the day, however, the closest method on the actual data is determined from the study of Chenni et al., (2007) with 99% of equivalency at 12:00.

Keywords: ***solar PV module; module temperature; a comparative study***

Photoelectrochemical cells based on ZnO/CdS composite films

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ABSTRACT

Composite films of ZnO/CdS have been deposited on glass substrates using an air spray pyrolysis technique. The obtained ZnO/CdS composite films were investigated by X-ray diffraction (XRD), and UV-Vis spectroscopy, for as-deposited and annealed in air atmosphere. The electrical parameters of the samples were obtained by applying the dc constant electric field technique. The photovoltaic characteristics of the cells were investigated. The photochemical solar cells SnO_2-ZnO:CdS shows maximally a short-circuit current density of I_{sc}=0.8 mA/cm2 and an open-circuit voltage V_{oc}=0.80 V..

Keywords: ***ZnO/CdS; composite films; X-ray diffraction, photochemical solar cells***

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Electrical and electronics engineering

Steady State Characteristics of a Small Single-Sided Double-Layer Linear Induction Motor

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ABSTRACT

In the present paper an approach to electromagnetic field analysis on a single-sided double-layer linear induction motor is proposed; as an object of study, a small laboratory unit model 8228 Lab-Volt is selected. Numerical calculation of the electromagnetic field distribution is carried out by using the Finite Element Method (FEM) for investigation and analysis of the specific magnetic processes in the motor. For this purpose, is used the software package FEMM Ver. 4.2 which performs 2D calculation of the magnetic field.

The design of the linear induction motor involves many parameters that can be varied to affect the performance of the machine, such as pole pitch, number of poles, secondary surface resistivity, primary core, the air gap. It is started with field calculations and the computational results, such as the flux density distribution, resistive loss in the rail, the induced eddy currents in the plate and stator core loss, which are used for determination of steady-state motor characteristics. The calculated characteristics will be presented on charts. The special attention will be put on the magnetically produced forces and their dependence of the excitation currents, the vehicle velocity and the air gap length. The presented characteristics are good basis for steady-state analysis of the studied LIM.

Keywords: ***linear induction motor; characteristics; magnetic field; Finite element method; steady-state analysis***

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Electrical and electronics engineering

Shape Reconstruction of Obstacle Located above PEC plane

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ABSTRACT

Shape reconstruction of perfect electrically conducting (PEC) 2-D obstacle located above PEC plane is presented. It is assumed that this obstacle is infinite cylinder with arbitrary cross section and its cylinder axis is parallel to PEC plane. This obstacle is illuminated by monochromatic plane wave whose electric filed is along cylinder axis. Scattered field is measured in both near field or far field and used to construct cross section of obstacle by using Hybrid Newton method. Hybrid Newton method is an iterative method starting with initial estimation of cross section of the obstacle. Scattered field is represented by single layer integral equation, whose Kernel is Green's function of the region with PEC plane, defined on initial estimation. Since this integral equation is ill posed, it is solved by Tikhonov regularization. This method does not require to solve direct scattering problem in each iteration step and Frechet derivative which are computationally expensive. This iterative method continues until some predefined criteria is satisfied. The proposed method is applied to some illustrative examples and good reconstruction is observed.

Acknowledge: We would like to thank the KBU-BAP unit for their support.

Keywords: ***inverse obstacle scattering; scattering; Newton method***

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Electrical and electronics engineering

A Lower Extremity Prosthesis System Design Based on Myoelectronic Controller

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ABSTRACT

Electromyography (EMG) is a medical technique for evaluating and recording the electrical activity produced by skeletal muscles. EMG method has become more accurate in prosthetics design and exoskeletal assistive devices with the help of recent improvements in signal processing technology. Scientific studies have been conducted to quantify attributes that may be important in the creation of more functional and comfortable lower-limb prostheses. The prosthesis socket, a human-machine interface, has to be designed properly to achieve satisfactory load transmission, stability, and efficient control for mobility. In this study, a new control mechanism of lower-limb prostehesis was designed based on the the myoelectric system principles and its conditions of use was tested on three subjects. EMG sensors were placed on internal of prosthesis socket and data acquisition via Myoware EMG module. Position sensors were used for acquiring the motion data via an Arduino board. Using this position data, the corresponding responses of the upper and lower hydraulic cylinders with the motion of knee joints and ankles were controlled via this microcontroller board.

Keywords: ***Electromyography; Prosthetics; Lower extremity; Arduino***

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Electrical and electronics engineering

Newton Method for Reconstruction of Medium Parameters

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ABSTRACT

Newton method for reconstruction of dielectric cylinder from scattered field is presented. It is assumed that infinite dielectric cylinder is located in free space and its permittivity and conductivity change within 2-D cross section. This cylinder is illuminated by monochromatic plane wave whose electric filed is along cylinder axis. Scattered field is measured in both near field or far field and used to construct permittivity and conductivity of the dielectric cylinder within its cross section by using Newton method. Newton method is an iterative method starting with initial estimation of permittivity and conductivity in reconstruction region which covers cylinder cross section. The reconstruction region can be obtained by bandwidth of Fourier transformation of the scattered field or prior knowledge about the cylinder. By using data and state equation related to fields, Frechet derivative is obtained for Newton method and estimation of permittivity and conductivity is updated. This procedure continues until some predefined criteria is satisfied. The proposed method is applied to some illustrative examples and good reconstruction is observed.

Acknowledge: We would like to thank the KBU-BAP unit for their support.

Keywords: ***inverse scattering; scattering***

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Electrical and electronics engineering

Dynamic Modeling of Three Phase Induction Motor Using MATLAB/Simulink

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ABSTRACT

The determination of the dynamic characteristics of a motor is very important in order to have a proper overview of the dynamic response of the motor at different working regimes. Especially this is important for regimes that have hazardous implications for the motor. In this paper an investigation of the dynamic characteristics of a three-phase induction motor is going to be presented. In order to perform the dynamic analysis of the motor an adequate determination of the equivalent circuit motor parameters should be performed. The equivalent circuit parameters of the motor are determined by applying to the motor a no load and a short circuit test. After the motor is properly modelled in MATLAB/Simulink a numerous investigations for different loads and dynamic working regimes are performed. In the full version of the paper the methodology for measurement and determination of the equivalent circuit parameters will be presented, as well as the dynamic model of the motor and the dynamic characteristics for different working regimes of the motor.

Keywords: ***Induction motor; Dynamic modelling; Motor parameters;***

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Electrical and electronics engineering

Mobile Oscilloscope Application to Acquire Real-Time Signals Wirelessly

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ABSTRACT

An oscilloscope is a commonly used laboratory instrument to display and analyze the waveform of electronic signals as a function of time. In addition, portability is also desired property for this device when especially it is used in the medical area, for example. However, a portable oscilloscope is expensive. In this study, a mobilloscope (mobile oscilloscope), is a mobile-phone application with an external hardware to display real-world signals wirelessly, is implemented. Beyond the mobility property, Mobilloscope accepts the signals via wireless environment using Bluetooth Communication. Arduino MEGA board is used in acquiring data from the real-world and to transmit this data to an Android-based phone (or tablet). Arduino-side application is implemented as 32-line code using Arduino IDE and Android-side application is implemented as 540-line code using Android Studio. This study is able to acquire real-time data and draw it on the phone's screen instantaneously. As a limitation, this implementation of mobilloscope has only one signal channel now. In the future studies, increasing the number of signal channels is planned.

Keywords: ***Oscilloscope; Arduino; Android; Signal acquisition; Mobile application***

Computer and communication engineering

Design of Incubator Control System with Online Video Streaming using Raspberry PI

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ABSTRACT

Since the premature babies and infants with health problems are not able to maintain their homeostasis, a safe area to balance temperature and humidity and to supply fresh air with no bacteria is required in order to prevent their health conditions from worsening. This type of safe area can be supplied by an incubator. In addition, it is also necessary for doctor supervision and nursing care. Because of challenges and the importance, the electronic control system with video support of incubators is quite expensive. In this study, a cheaper alternative that uses a Raspberry PI was presented. It is capable of monitoring, managing and recording temperature data from 3 temperature sensors inside the incubator, operating desired devices (heating, cooling, supplying fresh air) using digital outputs, sending online video via USB-Webcam. Nonetheless, because the capacity of the system is limited, the frame rate of the system is reduced down to 15 fps.

Keywords: ***Incubator; Raspberry PI; Data acquisition; Signal processing; Embedded systems; Video streaming***

Design of a New Electronic Board to Control Wheelchair Motors Using EOG Signals

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ABSTRACT

In this study, a motor control system is designed for wheelchairs to run two motors using only signal obtained from eyes. Electrooculogram (EOG) is a measurement technique to acquire potential differences from eye movements. Five electrodes are attached to both sides of horizontal and vertical locations near to eyes with a reference electrode. All eye movements can generate up to only 500 microvolts. An electronic card is designed to amplify these EOG signals and to eliminate unwanted frequency components using filters. Then, clean EOG signals are applied to analog inputs of an Arduino NANO board. The developed Arduino program gives a decision to the direction of eyes. The eye direction of “Up and Down” is used for speeding up and down of both motors, respectively. Similarly, the eye direction of “Left and Right” is used for stopping the left motor and the right motor, respectively. As a result, an electronic board was designed and Arduino program was coded to control motors of a wheelchair in this study. The designed system was tested by four volunteers and achieved perfectly-classified motor directions.

Keywords: ***EOG; Arduino; Wheelchair; Motor control***

Energy Optimal Quadrotor Stabilization Using PD control obtained by BB-BC Algorithm

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ABSTRACT

The quadrotor is an unmanned aerial vehicle with high maneuverability, four propellers, six degrees of freedom and VTOL capability. They have been the focus of attention in recent years because of their simple structure and cheap cost. In contrast to its simplicity, its nonlinearities and coupled dynamics make it control challenging. PD control is widely used in quadrotors due to its simple structure. In this manuscript, a PD controller for altitude and position stabilization of quadrotor is proposed using Big Bang-Big Crunch (BB-BC) optimization algorithm. An objective function is defined to provide not only reaching the desired position accurately and fast but also decreasing the consumed energy during this motion. For a performance verification of the proposed approach, a test path is considered from rest position to the desired position. Obtained results demonstrate that altitude stabilization is provided in short times and energy consumption is decreased considerably. PD controller parameters obtained by BB-BC optimization algorithm significantly outperforms the ones set manually.

Keywords: ***quadrotor; PD control; optimization; big bang-big crunch; position control.***

Evaluation of Queue Management Algorithms in LTE Networks

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ABSTRACT

Increasing the usage of smart mobile devices laid out in front of the need for high data rate in mobile communication. The fourth – generation communications technology, LTE(Long Term Evaluation) has been developed to address this need. When compared to previous cellular systems, new networks structure of LTE is designed to enable the cellular communication at higher speeds and efficiency, simplify the process and reduce cost. One of the most important issues accepted by researchers in LTE cellular systems is to develop queue management algorithms for RLC (Radio Link Control). The success of queue management algorithms depends on parameters such as delay, packet drop and network output. Simulation software is used to evaluate the developed queue management algorithms and to test their performance. In this study, the topology is designed using NS-3 network simulator and the success of the queue management algorithms that Drop Tail, RED (Random Early Detection), CoDEL (Controlled Delay) and pFIFO (Priority First in First Out) are examined.

Keywords: ***wireless; network; protocols; simulator; NS-3;***

Non-scientific requirements of scientific journals, suggestions and need of a one click software

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ABSTRACT

Scientists are always producing new results that has to be publish in some form; mostly in peer-reviewed journals in the form of communications, letters, research articles etc. Due to distinct format of each journal, authors has to write according to the author's instructions of the target journal. Most of the manuscript are being rejected, and to submit to another journal, we have to change the format of journal including title page, headings and subheadings, numbering and bullets, formatting the page (indentions and margins, Line spacing font size, font) etc. Often we waste two/three days just to change the format. We can deal with the references styles using Endnote, that is also expensive software. Mendeley and Zotero are available for free but the reference style of most of our desired journals are not available and it is not easy to edit a present style. Time is money, precious and should not be loose in formatting. We suggest a single format for all scientific journals. If for commercial reasons, a single style is not possible, then we suggest for a software where the format of the manuscript (title page, author names and addresses, headings, bullets and numberings, figures and tables, references etc.) with a single click; by just selecting the name of desired journal. In this regard, we are working on "Palvasha Manuscript manager". Herein we are presenting a beta version of the desired software. We are planning to upgrade our software so that in a single place, one can write the manuscript, draw figures and drawings, create tables, find most suitable journal as well as submit the manuscript automatically to the desired journal with a single click.

Keywords: ***scientific journals, non-scientific requirements, manuscript formatting software, submissions***

5G Next Generation Wireless Network Concept

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ABSTRACT

Mobile communications and wireless networks are developing at an outstanding speed, with evidences of significant growth in the areas of mobile subscribers and terminals, mobile and wireless access networks and mobile services and applications. Mobility management, network selection, handover mechanisms and QoS control in next generation heterogeneous networks are still open research issues and all of them depended to each other.

In this paper, different mobility solutions in heterogeneous wireless networks are over-viewed and classified according to their layer. QoS support for mobility, network selection and handover mechanisms are also reviewed to have complete picture of next generation networks.

Keywords: ***5G, next generation networks, QoS, heterogeneous networks, mobility, wireless networks***

Pilot Tones Design Using Genetic Algorithm for OFDM-IDMA System

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ABSTRACT

In this paper, since the positions of pilot tones have a direct effect on the channel estimation performance, the Genetic Algorithm (GA), having a widespread use in various complex problems in different engineering areas is utilized for optimizing the positions of pilot tones in order to increase the performance of Least Squares (LS) Algorithm employed for channel estimation process in Orthogonal Frequency Division Multiplexing- Interleave Division Multiple Access (OFDM-IDMA) system. Besides, Gershgorin disc theorem is used for obtaining the upper bound of Mean Square Error (MSE) employed as an objective function of GA to get rid of computing matrix inversion which is imperative in obtaining MSE. In the simulations, the proposed GA based pilot design technique is compared with the classical methods called random and equispaced based pilot placement strategies according to the MSE and Bit Error Rate (BER) criteria. Simulation results show that our proposed method leaves behind the other considered strategies with a minimum impact on the system complexity thanks to the usage of upper bound of MSE as an objective function.

Keywords: ***Pilot tones design; OFDM-IDMA; channel estimation; LS algorithm; GA***

On Adopting Networking Research in Undergraduate Education

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ABSTRACT

Sensor networks have an ever increasing role in sensing, monitoring, and real time applications. The seamless network operation is facilitated by ensuring the wireless connectivity of the power limited sensors over the network coverage area. The possible applications are numerous including, e.g., environmental, health, industrial and utility monitoring.

Such considerations have the potential to be adopted into undergraduate networking education due to their ability to illustrate the interplay between the coverage area, the number of sensors, their power, the packet size, packet retransmissions, and quality-of-service requirement. In doing so, the emphasis needs to be placed on the development of easy to use tools, that readily illustrate the impact of various parameters on the network performance.

Keywords: ***networks; sensors; education;***

PAPR Reduction Using Particle Swarm Optimization for LBWPM System

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ABSTRACT

The progression in technology requires improved modulation techniques for wideband digital communication systems. Orthogonal frequency division multiplexing (OFDM) and lifting based wavelet packet modulation (LBWPM) are efficacious systems to fulfill high-speed data transmissions needs. However, high peak-to-average power ratio (PAPR) which results in a significant reduction in performance and power efficiency is one of the serious drawbacks of OFDM and LBWPM systems. Due to scientific and industrial relevance, the investigation of the PAPR reduction in OFDM and LBWPM systems have become popular subject in the current decade. This study presents a PAPR reduction method with a low computational complexity based on a combination of Particle Swarm Optimization (PSO) algorithm with PTS scheme in LBWPM system. A set of simulations are performed to comparatively evaluate the PAPR reduction performance of the PSO-PTS scheme in LBWPM and OFDM systems.

Keywords: ***LBWPM; lifting scheme; PAPR; PSO; PTS***

Arrhythmia Classification Using Fuzzy C-Means Clustering

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ABSTRACT

In this study, a Fuzzy C-Means (FCM) based arrhythmia classification system was proposed. It was aimed to determine arrhythmia type using raw ECG directly with no help of any feature extraction techniques. The used ECG data set consists of normal heart beats and six different arrhythmia beats (Left bundle branch block, Right bundle branch block, Atrial premature contraction, Ventricular premature contraction, Ventricular escape, Ventricular flatter wave). The dataset has 17211 records in total that are recorded from 15 subjects. FCM is a clustering algorithm. All the necessary code was implemented in the integrated development environment of MATLAB version 2015a. To achieve performance evaluations, Sensitivity (SEN), Specificity (SPE) and Accuracy (ACC) values were calculated. Results show that the classification performance of normal beats is very high with values of SEN, SPE and ACC as 99.8%, 83.6% and 85.7%, respectively. Left and right bundle branch block beats were also classified with high accuracy. Nonetheless, other arrhythmia types cannot be classified with high performance.

Keywords: ***Clustering algorithm; Fuzzy C-Means; Arrhythmia***

Composition of Web Services for student evaluation system

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ABSTRACT

Composition of Web Services is the process of combining two or more services to create contemporary information systems. In this research we intend to establish a better communication among Web services for student evaluation system which will allow students to do the evaluation on instructors online or in LAN form, depending on implemented architecture. Furthermore, we intend to ease the access of data managed by the administrator in more effective way. In addition, the data will be conveyed in XML and SOAP format to reach loosely coupled status. Web services will be composed in the way that it will allow to reuse them in different forms. Analyzing of data will be done in different form depending on the way we want to show it. All the data will be centralized.

Keywords: ***Web Services, Evaluation System, Composition of WS***

Chemistry, Chemical and Environmental Engineering

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Chemistry, Chemical and Environmental Engineering

3D printing technology for quick prototyping of micro-hydrocyclone components

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ABSTRACT

Small diameter hydrocyclones, or micro-hydrocyclones (below 100 mm), are commonly used in the industry due to their ability to achieve cut sizes lower than 40 μm. The common technology for their fabrication is the polyurethane injection molding. For small productions, molding is cost expensive. Moreover, it is necessary to modify the mold for each modification of the standard design. Therefore, the study of micro-hydrocyclone performance by means of functional prototypes requires time an important inversion. 3D printing technology is a cheaper and faster alternative. This work analyzes the 3D printing technology for functional prototyping of micro-hydrocyclones components. In this study, a 50 mm micro-hydrocyclone was used and two identical vortex finders were tested: one built in the traditional way using polyurethane and the other one made with a plastic 3D printer using PLA. The components were tested at 4 different pressures and 3 repetitions were made at each pressure. The results show that the difference between the cut sizes obtained with the two vortex is negligible. Consequently, it is concluded that plastic 3D printing technology is appropriate to build functional prototypes of micro-hydrocyclone components.

Keywords: ***micro-hydrocyclone; 3D printing technology; prototype***

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Chemistry, Chemical and Environmental Engineering

The Friction and Wear Behaviors of Nylon 6/Polypropylene/SEBS-g-MA/ Nanoclay Composite Against Steel

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ABSTRACT

In this experimental study, the friction and wear behavior of montmorillonite nanoclay filled nylon 6/Polypropylene (PA6/PP) polymer blend with compatibilizer (styrene-ethylene/butylene-styrene (SEBS-g-MA)) have been studied. Friction and wear studies were carried out using a pin-on-steel disc wear tester under dry sliding conditions. Friction and wear tests were run at sliding speed of 0.5 m/s and applied load of 20N values. The results show that the addition of compatibilizer into the nylon6/PP blend resulted to enhancement in coefficient of friction and specific wear rate values while montmorillonite 2.5wt.% nanoclay addition into the PA6/PP-5%SEBS-g-MA blend resulted to an increment in specific wear rate value but decreasing in coefficient of friction. Optical microscope was used to investigate microstructural properties of Nylon 6/PP/SEBS-g-MA polymer blend and composite.

Keywords: Nylon; wear; polypropylene; nanoclay; compatibilizer

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Chemistry, Chemical and Environmental Engineering

Effect Of The Length Of Fountain Confiner On Bed Pressure Drop In A Conical Spouted Bed

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ABSTRACT

Spouted bed is a valid technology for a variety of processes. However, the processing of smaller particles with broad size distribution is an underdeveloped area, so the advances in this field could open new ways of research and even give rise to new design projects of equipment for industrial processes. It has been already demonstrated that the addition of a fountain confiner is a very useful alternative to manage fine particles and achieve stable fluidization. With the final aim of designing a new dryer for fine sands based on spouted bed technology, in this paper, a stainless steel conical spouted bed provided with a draft tube and fountain confiner has been studied to determine the influence of the length of the confiner on the bed pressure drop. The most important result of the study is that a large fountain confiner improves the hydrodynamics, reducing the bed pressure drop without loss of effectiveness in the reduction of elutriation. Furthermore, pressure values obtained with a largest tested confiner were similar to a conventional contactor, so it is possible to obtain its benefits without a worsening of the process hydrodynamics. This is crucial to a good design of the new device.

Keywords: ***spouted bed; fine particles; hydrodynamics, fountain confiner***

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Chemistry, Chemical and Environmental Engineering

Tribological Behavior of Glass Fiber Reinforced Poly-ether-ether-ketone Composite A gainst Steel and Polymer Counterparts

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ABSTRACT

In this experimental study, the tribological performance of poly-ether-ketone (PEEK) reinforced with glass fiber composite materials against steel, polymer blend and polymer composite materials under dry sliding condition were evaluated. Wear tests were carried out on a pin-disc arrangement and under 0.707, 1.41 and 2.12 MPa applied pressures and 0.5 m/s sliding speed condition. Disc materials, stainless steel, 10wt.% poly-tetra-fluoro-ethylene (PTFE) filled poly-ether-imide (PEI) polymer blend and 40wt.% glass fiber reinforced poly-phenylene-sulphide (PPS) composite were used. The results show that the coefficient of friction and specific wear rates for PEEK polymer against steel, polymer blend and polymer composite material increases slightly with the increment of applied pressure values. Finally, the specific wear rates for PEEK polymer, against stainless steel, PTFE filled PEI polymer blend and glass fiber reinforced PPS composite under dry sliding conditions are in the order of 10^{-15}, 10^{-14} and 10^{-14} respectively. The results suggested that it is more convenient to use PEEK+30%GFR composite against steel for tribological applications.

Keywords: Polymer, wear, PEEK, PEI, PTFE

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Chemistry, Chemical and Environmental Engineering

Concentration and Toxicity of OCPs in Meric-Ergene Basin

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ABSTRACT

The Meric-Ergene Basin, located on the north-western part of Turkey, begins with the Istanbul provincial border in the east and covers the border area with Bulgaria and Greece borders in the west. The industry developed at a rapid race, especially in the last fifty years, despite the importance of agriculture in the basin. A significant part of the basin is made up of agricultural land. 65% of the total area of the basin consists of agricultural arable land and most of the wheat, sunflower, corn, paddy and canola are planted.

In the study, 18 types of Organochlorine Pesticides (OCPs) were determined in 4 regions of in an intense industrialized area, industrial+residential area, an agricultural area and a background area in total of 12 points, in 2014-2015, representing 4 seasons, in soil, bioindicators (lichen and pine needles) and bulk samples, in the basin. According to obtained results, spatial and seasonal changes in OCPs concentrations were set forth and "Incremental Lifetime Cancer Risk" were conducted for the observed values. According to the information obtained, total OCP reached the highest concentrations in agriculture and background areas and the "Cancer Increase Rate" due to the OCP concentration was found to be over 10^{-5}.

Keywords: ***Organochlorine pesticides, bioindicators, incremental lifetime cancer risk, Meric-Ergene basin***

Acknowledgement: ***The present study was supported by TUBITAK (Scientific and Technological Research Council of Turkey) under Grant Project No:112Y070***

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Chemistry, Chemical and Environmental Engineering

Biocatalitic diameter influence of beads immobilized in kinetic fermentation with immobilized yeast

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ABSTRACT

The immobilization of yeast cells on alginate is a simple and effective method. Fermentation with immobilized yeast depends from the way of immobilization ($CaCl_2$ and alginate Na concentration), the size of beads, vitality and the generation of yeast.

Alcoholic fermentation with immobilized cells of yeast *Saccharomyces cerevisiae* in alginate have been carried out in batch bioreactor. We have used three different biocatalysts particles sizes. Immobilized beads were used for six batches.

Batch after batch beads increase their diameter with 0.5 – 2 mm. Tendency of growth is linear with initial bead size. Bead growth iameter is higher on beads with initial large diameter. Bead size increase is accompanied with the release of alginate structure and cell flow from the matrice to the fermentation medium. Michaelis- Menten kinetic constant is not affected by beads size.

Keywords: ***immobilized cells, yeast, beads diameter, alcoholic fermentation, alginate***

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Chemistry, Chemical and Environmental Engineering

Biodiesel production using NaOH/sepiolite as heterogeneous base catalyst

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ABSTRACT

NaOH/sepiolite catalyst were prepared via impregnation process and tested in three-neck flask equipped with reflux condenser for biodiesel production from transesterification of canola oil in excess methanol. The ratio between NaOH and sepiolite was selected as 1:4. In order to obtain maximum yield of biodiesel was studied the influence of various operational parameters such as methanol to oil molar ratio, catalyst dosage, reaction temperature. Raw sepiolite and modified sepiolite are characterized by FT-IR, XRD, SEM and EDX. This work can be a good candidate as the practical application of biodiesel production.

ACKNOWLEDGMENTS: The authors are grateful to Mugla Sıtkı Koçman University Research Fund (13/125) for financing this research.

Keywords: ***NaOH/sep.; canola oil; trans esterification; biodiesel production***

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Chemistry, Chemical and Environmental Engineering

Determination of heat demand and optimal production capacity for yeast production by use of MS Solver

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ABSTRACT

The main cost of production is directly related to the heat demand, the quantity of used raw material and the prices of raw materials and utilities. This value could be optimized. So, the main task of this work would be the minimization of heat energy demand and maximization of production capacity. For these purposes, it was created a simulation model as mathematical function of all inputs and outputs of the analyzed system. That model is based on mass and heat balances for all streams which connect processing units in different modes of work as batch, continuous, semi-continuous and feed-batch. This mathematical model was made in MS Excel. All variables like temperatures and flows are inserted in that worksheet and calculated from set of equations for mass and heat balances. Change of values for input variables (quantity of raw materials), cause changes of all processing parameters and parameters that characterize final products. The optimization is done with MS Solver. That tool use only one parameter as objective for optimization. Because of that, three different objectives were chosen for three different optimization goals for the production processes. Optimization was done as minimization of total heat demand, maximization of final product's capacity and minimization of the common parameter that relate to heating demand and production capacity. The use of the common parameters for heat demand and production capacity gives the best result, because it minimized heat energy and maximizes production capacity. This optimization also created optimal process scheduling as its result.

Keywords: ***optimization; heat demand; heat recovery; Baker`s yeast***

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Chemistry, Chemical and Environmental Engineering

The Utilization and Comparison of Nano Fluids in the Air to Air Heat Exchanger Systems

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ABSTRACT

The global warming has become one of the most significant concerns for a few decades. Heat recovery systems have come forward to overcome this issue. Therefore, in this study, the heat pipe heat exchanger is designed to be employed in HVAC units to increase the heat transfer rate in the heat exchanger by using nano fluids. In the experimental setup, 15 wickless copper pipes, 14 K type thermocouples, anemometers and data logger are used. For the experimental study, 1/3 of the evaporator volumes of heat pipes are filled with working fluids. Thus, it is determined that the heat is removed from the condensation section by using different cooling air flows and two different heating powers in the evaporation section. In addition, titanium dioxide and fly ash experiments are performed, respectively and the results are compared with each other. Results show that the maximum thermal efficiency of the heat pipe heat recovery system is determined as 68% by using fly ash nano fluid as the working liquids at a heating power of 3 kW, air velocity of 1.5 m/s and air flow of 0.061 kg/s.

Keywords: ***Heat Recovery; Nano Fluids; Heat Pipe***

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Chemistry, Chemical and Environmental Engineering

Tribological Behaviour of Barite Filled High Density Polyethylene Composites

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ABSTRACT

In this study, the friction and wear behavior of barite filled high density polyethylene (HDPE) polymer composite have been studied. Ttribological studies were carried out using a pin-on-steel disc wear tester under dry sliding conditions. Friction and wear tests were applied at sliding speeds of 0.5 and 1.0 m/s and applied load of 50N, 100N and 150 values. The results show that the addition of barite filler into the HDPE polymer matrix material resulted to enhancement in coefficient of friction and specific wear rate values of the composite material. Furthermore, an optical microscopy was used to investigate microstructural properties of HDPE composite filled with barite.

Keywords: HDPE; composite; wear; barite; tribology

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Chemistry, Chemical and Environmental Engineering

Removal of COD and Color from Biologically Treated Textile Effluents by Adsorption and H_2O_2/UV Oxidation

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ABSTRACT

The aim of this study was to compare COD and color removal efficiencies of adsorption and H_2O_2/UV oxidation for biologically treated textile industrial effluent. The sample quality used in the study was as follows: pH:7.55, COD: 200 mg/L and color: 50.3 m^{-1}. It was aimed to reduce COD to 50 mg/L and color to 15 m^{-1}. Granular activated carbon (GAC) and rice husk ash (ARHA300, burned at 300 ^oC) were used in the adsorption study. BET surface areas of GAC and ARHA300 were determined as 825 m^2/g and 143 m^2/g, respectively. Batch studies were carried out under natural pH and different contact times. The maximum color removal rates for GAC and ARHA300 were determined as 19.3% and 15.9%, respectively at 7.5 g/L of adsorbent doses. The best COD removal rates were as 35.5% at 16 g/L GAC doses. In the H_2O_2/UV oxidation method, samples were taken at different contact times (0, 10, 20, 30, 40, 50, 60 and 80 min). The removal rates increased with time and H_2O_2 concentration. COD and color values were obtained as 43.5 mg/L and 9 m^{-1} at 208 mg/L H_2O_2. It has been found that the discharge standards are met by H_2O_2/UV oxidation method.

Acknowledgement: This study was supported by the Namik Kemal University scientific activities participation support program.

Keywords: ***biologically treated textile effluent; adsorption; H_2O_2/UV; COD; color***

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Chemistry, Chemical and Environmental Engineering

Assessment of the qualities of tap water taken from Istanbul and Tekirdağ

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ABSTRACT

In this study, samples were taken from five different sampling points in Istanbul (Avcılar, Silivri and Ümraniye) and Tekirdağ (Çorlu) at specific time intervals. pH, temperature, conductivity, hardness, iron, manganese, copper, phosphorus, chromium, nitrate, ammonia parameters were analyzed in order to investigate compatibility with drinking water standards. These quality parameters were evaluated according to TS266 (Regulation on Waters for Human Consumption) and quality of the samples were compared with each other. Avcılar (1S) and Silivri (2S) supplies water from Büyükçekmece Lake. Ümraniye (3S) supplies water from Ömerli Dam where is the largest source (220 million m^3/year) that meets 23% water needs of Istanbul. In Çorlu, where samples are taken from two different district (4S and 5S), drinking water is supplied from the wells. All these sampling points are rapidly polluted with rapid and irregular population growth, industrialization and agricultural activity. The samples were evaluated according to TS266 and it was found suitable to be used as drinking water. The conductivity and hardness values of 1S and 2S were 690 µS/cm and 701 µS/cm and 334 mg/L and 339 mg/L, respectively. Hardness, Fe^{+2} and Mn^{+2} values (362 mg/L, 0.1127 mg/L and 0.045 mg/L) for 5S were higher than all the others.

Acknowledgement: This study was supported by the Namik Kemal University scientific activities participation support program.

Keywords: ***Tap water; quality parameters; Tekirdağ; İstanbul.***

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Chemistry, Chemical and Environmental Engineering

Study of the Mechanical Performance of Chitosan Filled Polypropylene Composites

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ABSTRACT

In this experimental study, polypropylene based composites filled with up to 30 wt% chitosan mineral filler, were prepared by extrusion and injection molding rocesses. Chitosan filler, with weight percentages varying between 10 and 30 wt%, were added to polypropylene polymer matrix. Uniaxial tensile, impact, hardness and three-point bending tests were used to examine the influence of chitosan filler addition on the mechanical behavior of polypropylene. Tensile strength, tensile modulus, elongation at break, hardness, impact energy and flexural strength and flexural modulus were obtained. The results showed that the tensile strength, flexural strength, tensile and flexural modulus of polypropylene composite material increased with the increment of filler weight ratio while the impact strength and maximum elongation values decreased with the increase in chitosan filler content.

Keywords: Polypropylene; chitosan, composite; mechanical properties

Monitoring Of The Mosquitoes In Skopje 2016 And Impact Of Flood In Municipality Gazi Baba Of The Mosquitoes Populations

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ABSTRACT

In Republic of Macedonia malaria has been eradicated in 1973.Since then control of mosquitoes is a regular measure.In 2010, WHO initiated the re-analysis of the mosquitoes in the territory of the Republic of Macedonia.Today, monitoring of the mosquitoes is providing only in Skopje by team from P.H.O Center for public health – Skopje.

Collecting adults of mosquitoes for qualitatively and quantitatively prooving we has been used BG Sentinel traps.There were three traps, one trap in peri-urban area and two traps in urban areas.They were placed for six months and changed the nets every two weeks.Samples were returned in Entomological laboratory in P.H.O.-Skopje.

Monitoring has been started in april, when temerature is enlarge and populations of mosquitoes are increases.Traping adults of the mosquitoes in august in peri-urban area Gazi Baba, period of flood, are proof for proportionally increase temerature, humidity and mosquitoes.

There were interest results from entomological research on territory of Skopje, our idea is to expand the monitoring all over territory of the Republic of Macedonia.When we have information of species composition of mosquitoes in Macedonia, than we will choose the best way for their control and stop appearance and spreading the patogents.

Keywords: ***adults,mosquitoes,monitoring,flood,BG Sentinel***

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Chemistry, Chemical and Environmental Engineering

Baker`s Yeast Shelf Life Preservation in Presence of Alginates

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ABSTRACT

Food products are very sensitive to environmental conditions. That is especially high in a case of Baker`s yeast. Compressed (fresh) Baker`s yeast is actually microorganism`s strain Saccharomyces cerevisiae. It is unstable at temperatures above 4°C. The reason is budding of cells. If that is the case, yeast cells use stored components for feed. After the complete usage of energy components, cells make autolysis. Autolysis is a process at which cell is going to destroy itself. Cytoplasmic juice goes out of the cell membrane and fills intercellular space. The juice is full with water and components useful for other microorganisms. These conditions make ideal environment for growing other microorganisms and decreasing Baker`s yeast shelf life. The change of water content in the product can change its shelf life. There are food additives able to absorb water. They could be used for protecting the product with water absorbing. Two types of additives (alginates) with high water absorption capacity were observed in use added to compressed yeast. Different concentration of Sodium- and potassium alginates were used in preparation samples of yeast. Based on analysis of few product`s parameters, the samples with 0.2% alginate showed the best results in preservation. Increasing of alginate concentration, increase yeast stability, but decrease water solubility. Using of alginates can increase stability of Baker`s yeast quality.

Keywords: ***alginates; K-alginate; Na-alginate; compressed yeast; shelf life***

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Chemistry, Chemical and Environmental Engineering

Treatment of Real Textile Wastewater by Fenton Process: Comparison of Process Conditions for Raw and Biologically Treated Textile Wastewater Samples

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ABSTRACT

This study evaluates the effectiveness of Fentons oxidation process to remove color and COD from a textile industry. In the study the Fenton process was applied to raw and biologically (aerobically) treated wastewaters. The raw and treated textile effluents used in this study were obtained from a Turkish textile manufacturer. Polyester dyeing is processed in the textile manufacturer. The aim of the study is to reduce the COD to 50 mg/L and color to 15 m^{-1}.The experimental results are assessed in terms of chemical oxygen demand (COD) and color. The optimum conditions for raw wastewater were found as follows: H_2O_2 dosages: 2000 mg/L, Fe^{2+} dosages: 300 mg/L and H_2O_2/Fe^{2+} molar ratio:10.9. The Fenton process reduced the COD and color to 104 mg/L and 9.8 m^{-1} respectively for raw wastewater. The optimum conditions for treated wastewater were found to be H_2O_2 dosages equal to 212.5 mg/L, Fe^{2+} dosages equal to 50 mg/L and H_2O_2/Fe^{2+} molar ratio about 7. The results indicate that Fenton process leads to a reduction in the COD and color to 38 mg/L and 7.8 m^{-1} for biologically treated wastewater. The results indicate that Fenton process applied to treated wastewater guarantee a better final quality of the effluent.

Acknowledgement: This study was supported by the Namik Kemal University scientific activities participation support program.

Keywords: ***biologically treated textile effluent; Fenton; COD removal; color removal***

Architecture and Civil Engineering

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Architecture and Civil Engineering

Fracture Energy of Concrete under Extremely Low Temperatures

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ABSTRACT

From typical structures to underground tanks, concretes have a large variety of usage area. Cryogenic concretes tanks have been used to store the vast amount of cryogenic liquids. The design of cryogenic concrete tanks is crucial because of their strategical importance in which country have to use these special structures. Fracture based approach is more effective way to design critical structures. Ground Granulated Blust Furnace Slag were used to produce SF2 grade self-consolidating concretes in this study. To examine fracture energy of the concretes 50x100x480 mm pre-cracked beams were used. Extremely low temperatures were applied by using liquid nitrogen. Prepared concrete beam were subjected to one and five cycles cryogenic treatments. As a result, fracture energy of the self-consolidating concretes were decreased after one and five cycles of cryogenic treatment.

Keywords: ***Extremely low temperatures; Cryogenic concrete tanks; Fracture energy;***

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Architecture and Civil Engineering

Remodeling Suburban Settlements of Skopje

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ABSTRACT

In the last decades the citizens of Skopje are witnesses of serious urban degradations in almost any part of the capital. The process of high-speed densification of a built area creates series of side effects like: lack of natural daylight, bigger pollution, absence of proper views, decreasing of green area, diminishing the natural aeration etc. Therefore the unsatisfied citizens are starting to move outside of those extremely dense urban districts looking for cheaper building plots in the existing suburban settlements and looking for better life conditions. The city authorities are not responding to those tendencies in a proper way, because there is no any initiative to create urban plans covering bigger areas than the current DUPs (Detailed Urban Plans) in order to allow a complete and proper development of existing suburban areas. The goal of this paper is to create series and profound analyzes, and to propose new urban project for remodeling suburban settlements in existing location detected as a potential city hot spot. This project will define hospitable dwelling destinations for the possible future users for a long term and it could establish new guidelines for the future urban politics in the Macedonian capital.

Keywords: ***suburban area; dwelling zone; urban development***

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Architecture and Civil Engineering

Albanian Building Stock Typology and Energy Building Code in progress towards Methodology of Performance calculation on heating and cooling

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ABSTRACT

The engineering principles of the existing Albanian energy building regulation, as it was proposed and published by author as an legislative act in 2002 is beyond any doubt, a correct and still actual in official building thermal calculation. The relevant European regulation to the buildings energy demands are to ensure the maximum achievable energy savings, but not to impose an unbearable financial burden on the building constructors and prospective buyers. The energy loss coefficient, like the Gv, depended by Typology, the climatic zones and building thermal propreties is used to set the minimum requirements to the energy performance of existing buildings and 3 retrofited scenarios packages of measures are deployed on upgrading the building envelope, the heating, cooling and DHW system. For the very firs time an Albanian bottom up typology for building's stock is developed and used to match the existing regulation with minimum requirements on heating and coolin energy Performance

Keywords: building; energy code; energy performance: minimum requirements

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Architecture and Civil Engineering

The Comparison of Underground Temperatures in Six Different Locations for Designing Envisaged Heat Pump Use to Passive Houses

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ABSTRACT

Since energy needs have gained importance in the world in recent times, both the orientation towards new and renewable energy sources and the conservative use of energy have been the subject of research. The amount of energy consumed in residence in Turkey has the second highest rate of 30% after the industrial expenditure. Passive houses are insulated building types where maximum energy savings can be achieved. Meeting the thermal energy required by these buildings with the ground source heat pumps (GSHP) will enable enormous savings in energy. In this study, underground temperature values have been measured and compared depending on the depth in six different regions (in the wells opened in Karıt and Kapullu) in Karabük for the use in GSHP. For the measurement of the temperature changes in these wells, it is thought to descend to a depth of 10 m and the drilling wells in Karabük province has been benefited. As a result of the performed measurements, it has been observed that the temperature values are affected by the ambient temperatures, but the variation is very small after an average depth of 350 cm. The highest temperature value has been seen as 28.4 ^{o}C at a depth of 50 cm in the Kapullu-2 well in July when the outside air temperature is 38.4 ^{o}C, while the temperature value is also 14.4 ^{o}C at 350 cm depth. The lowest temperature value has been obtained as 1.7 ^{o}C at a depth of 50 cm in the Kapullu-3 well in December when the outside air temperature is 1.3 ^{o}C, whereas the temperature value is 6.8 ^{o}C at 350 cm depth.

Keywords: passive house; ground source heat pump, well temperature

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Architecture and Civil Engineering

The Geodetic Provision of Seismic Exploration in Caspian Sea

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ABSTRACT

The Azerbaijani sector of Caspian sea belongs to the basic interests of a national economy. There are fulfilling the complex of large-scale scientifically-practical works to forecasting and specification of power stocks for the purpose of investigation and operation of oil and gas deposits. Geodetic maintenance is the important component of these complex works.
In the research work by means of geodetic devices have been executed 2D and 3D sea-bottom models in near shelf zone of water area of the Azerbaijani sector of Caspian sea, with the barometric and sonar levellings are specified spatial points of supervision used in model, and also surveying of a sea-bottom's structure. Then with the 2D and 3D models have been studied morphological features of a relief of a sea-bottom, and initial accuracy is established with the pinging geodetic connection of geologic-geophysical points of supervision. Geodetic indicators is one of the major elements during performance and interpretation of seismologic-prospecting works.
Conclusions of the specified research have been practically tested on the Caspian deposit «Bulla» in 2016, and at present their application will proceed.

Keywords: Insure, Survey, Bathymetric, Model, Seismic exploration, Sonar

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Architecture and Civil Engineering

RC High rise buildings – seismic guidelines and design recommendations

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ABSTRACT

High-rise buildings are designed and constructed by use of modern materials and integral structural systems which are not usual for typical buildings. The existing seismic regulations act as a limiting factor and cannot cover specific behavior of these buildings. Considering the increasing trend in their construction worldwide, additional investigations are necessary, particularly for structures in seismically active areas. It is necessary to elaborate official codes which will clearly prescribe methods, procedures and criteria for analysis and design of such type of structures. The main goal of the paper is to present a review of the existing structural systems, design recommendations and guidelines for high-rises worldwide, as well as selected results from seismic performance of 44 stories RC high-rise building which is a unique experience coming from design and construction of the four high-rise buildings in Skopje (Macedonia).

Keywords: ***seismic performance; seismic guidelines; RC high rise buildings***

INTERNATIONAL CONFERENCE OF APPLIED SCIENCES, ENGINEERING AND MATHEMATICS

Architecture and Civil Engineering

Albanian Residential stock and future Energy saving Scenarios

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ABSTRACT

The aim of this study is to assist the design of energy efficiency for the residential buildings sector of Albania with necessary information. Taking into consideratio twenty representative categories of residential buildings, calculated their thermal energy performance in three climate zones, designed standardized retrofit packages, calculated possible energy savings, and investment required by building type. The study identifies the level and the structure of final energy consumption at present and in the future by building age category, building type, climate zone, and energy end-use.

There are suggested two packages of additional to the present policies, which aim to transform the residential buildings stock to low energy in the next 20 years. There is identifyed and estimated the level of efforts required to achieve such goals in terms of the floor area affected. Finally, there are evaluated energy savings, saved energy costs, avoided CO2 emissions, and cost-effectiveness of the proposed packages of interventions.

To conduct the analysis on the sector level, it is designed and applied a bottom-up simulation model. The model is applicable to the time period until 2030. It is assessed only thermal energy services delivered in the residential buildings, namely space heating, space cooling and water heating.

Keywords: residential stock; building efficiency; scenarios; savings

Education

Assessment of Teaching Effectiveness in Engineering Education

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ABSTRACT

A framework for evaluation of effectiveness in teaching and learning of core knowledge and professional skills in chemical engineering education has been developed by iTeach EU project (http://www.iteach-chemeng.eu/) consortium, involving six partner institutions from different countries (UK, France, Germany, Portugal, Slovakia and Macedonia). Initial testing of the framework included two teaching units, chemical reactor engineering and design project, as part of the core courses in undergraduate chemical engineering curriculum. Evaluation of six different metrics, such as strategic nature of the course/discipline, relevance of the proposed formation, pedagogical relevance of the teaching approach, perception of relevance of the pedagogical approach, evaluation of acquisitions and evaluation of transfer, being integral parts of the framework, allows easy assessment and comparison of efficiency in teaching among different institutions, as well as easier recognition of the areas of improvement in specific pedagogical methodologies.

Moreover, one of the goals of the project has been to establish a tool that could be used in assessment of delivering the core knowledge and employability competences in the education of different scientific disciplines. After some adaptation and improvements, the framework was subjected to a wider testing including stakeholders groups with different educational and professional experiences. The effects of this testing concerning variety of teaching approaches will be elaborated and discussed.

Keywords: ***lifelong learning, teaching effectiveness, higher education***

An Analysis of the Situations of Software Engineering Departments in Turkish Universities

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ABSTRACT

The developed nation's economies are dependent on software technologies. In our day, more and more systems are becoming computer-controlled. With Industry 4.0 the role of software has gained even further momentum and become a critical core competence for developing and maintaining smart systems.

Software Engineering is a discipline that envisions the production of software by engineering methods and produces methods, tools, techniques and methodologies in this direction. In this view, Software Engineering can be considered as a set of methods, a set of techniques, or a set of tools. Software engineering aims to reduce the complexities of software production.

In Turkey, departments that provide software engineering education started to be established in 2000s. Now there are 13 software engineering undergraduate programs in Turkey.In this study, software engineering undergraduate programs in Turkey are considered and a statistical analysis is provided about the number of intakes and performance of the departments in national entrance examination.

Keywords: ***Software Engineering; Undergraduate; Software***

Social Networks as Teaching and Learning Tools

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ABSTRACT

New technology revolutionizes the teaching and learning process. The gap between our school curriculum and the circumstances of the 21st century society, the learners, developments of the 21st century skills and great learning opportunities are facts on why new technology should be used in Math's teaching and learning.

The sample of this research are high school students in Tetovo, who received and conducted a questionnaire. Pearson's correlation coefficient was used to calculate the results of the questionnaire and the results confirmed the hypotheses that the use of social networks by students is not in correlation with their success in school and the following school year. Therefore, it can be used with and for all students as an assisting tool for teaching.

Keywords: ***Math education, Social Networks, teaching, learning, Net generation.***

Tools and Methods for Educational Data Mining

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ABSTRACT

Recently most of the educational institutions collect and store huge amounts of data about their students from enrollment to exam results. Dealing such kind of data requires different data mining methods with machine learning, statistics, information visualization and computational modeling. Specifically Educational Data Mining (EDM) is an emerging research area which can cover all these disciplines. EDM can also be used for students' success prediction as well as evaluating teaching methods and learning outcomes.

This paper contains the classification of the recent tools and methods used in EDM.

Keywords: ***Educational Data Mining, EDM tools, success prediction***

Mobile Learning System Based on the Cloud Environment

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ABSTRACT

Cloud learning is the late and arising approach related to cloud computing. Today, there is an increasingly growing interest for online-based courses which is noted from a considerable number of educational institutions. Advancements in technology bring new concepts and ideas in online learning. Mobile learning presents one of the most significant e-Learning models. In the recent years, mobile device and wireless communication technology has significantly changed. Nowadays, more and more learners prefer to use mobile devices and Smartphone for mobile learning. However, many m-learning solutions have shown to have more difficulties than advantages considering limited storage space in mobile phones, existing issues of bad computing ability, etc. To overcome these limitations the cloud computing approach in mobile learning is introduced. The paper analyses mobile learning, improvements gained from cloud computing and aims to introduce mobile learning system model based on cloud computing, which will help in improving the development of mobile learning.

Keywords: ***M-learning; cloud computing; e-learning; mobile cloud computing***

Free Testing and Quizzing Tools for Online Education – Socrative

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ABSTRACT

Tests were created in order to probe the students' knowledge on programming. The questions were uploaded to the more quizzing tools for online education. Online testing was performed with the students. The data of the test were stored on the different clouds. After the test, survey was conducted in order to probe the students' response on online testing. The results of the survey show the positive students' attitude towards use of new technologies in higher education and online tests. However, some problems appear which requires further development of the online test procedure. The support from Mobile cloud computing is the availability of cloud computing services in a mobile environment. By providing optimal services for mobile users MCC incorporates the elements of mobile networks and cloud computing.

Key words*: online test, smartphones, android, Mobil Cloud Computing*

FULL PAPER INFORMATION

1. Conference proceedings

Selected full papers, among those presented as abstracts at IBU-ICASEM 2017, will be published in the conference proceedings which will be available after September 2017. All above papers will be accessible online through the website of the International Balkan University dedicated to ICASEM 2017 (www.icasem2017.ibu.edu.mk).

2. Final paper submission process in journal Facta Universitatis, Series: Mechanical Engineering

a) 50% of the papers should be from the authors from foreign countries (Macedonia, Serbia, Bosnia and Hercegovina, Crna Gora are not considered as foreign countries)

b) Papers submitted to the journal should differ from the Conference papers, not just by the format, by in the content as well.

"The FU MechEng guidelines require such submissions to contain a significant amount of new material, that is, material that has not been published elsewhere. New results are desired, but not necessarily required; however, the submission should contain expansions of key ideas, examples, elaborations, etc. of the conference submission. The paper submitted to the journal should differ from the previously published material by (roughly speaking) at least 40 percent. Beside other elements, the paper needs to include a high quality overview of the previous and up-to-date work in the field by other authors as well as a clear statement on the novelty offered by the manuscript."

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Name Surname[1], Name Surname[2]
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Key words (bold): *key word 1, key word 2... to (max) key word 6, min 4*

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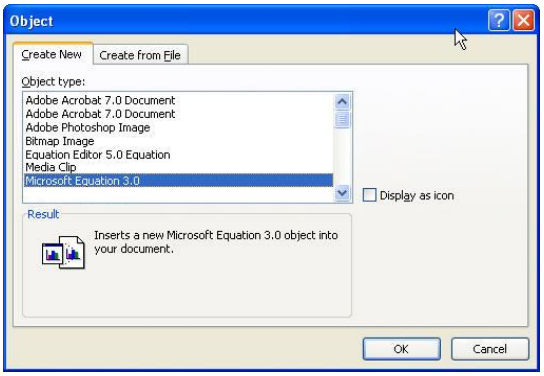

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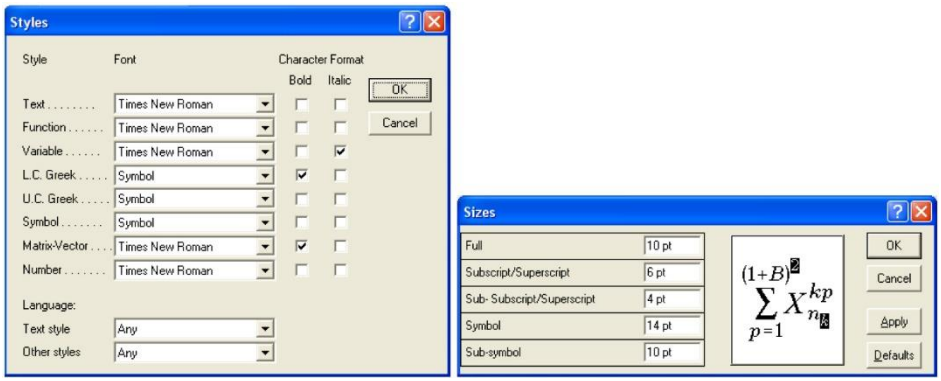

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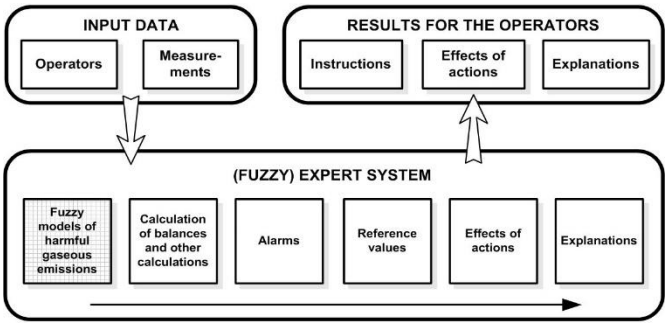

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System	Symbol
Without delay	+
Delay $h = 1$	–
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Acknowledgement: *The paper is a part of the research done within the project 1234567890. The authors would like to thank to the... (Style Acknowledgement).*

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INDEX