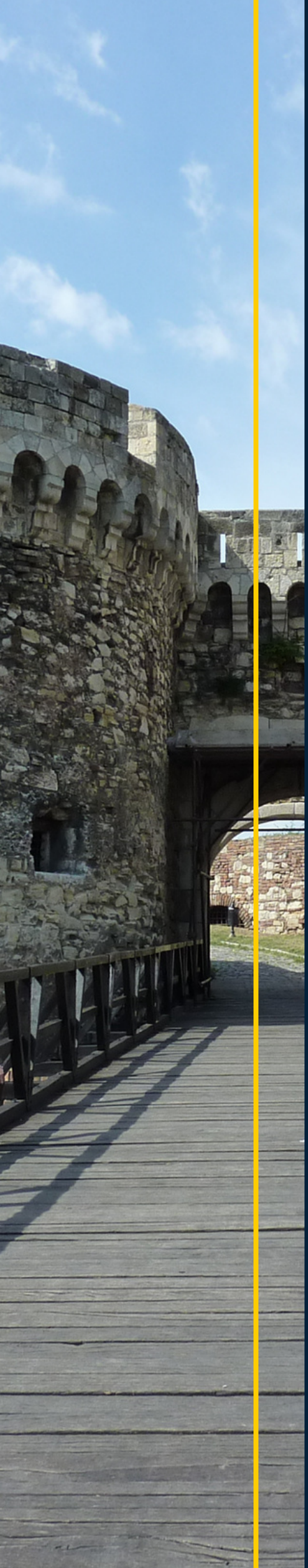

ICENS

6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCES

BOOK OF ABSTRACTS

www.icens.eu

October 21, 2020

Organized by

Partners

6th INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCES (ICENS)

ISBN 978-605-81426-0-2

BOOK OF ABSTRACTS OF THE 6th INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCES (ICENS) (ICENS 2020)

OCTOBER 21 TO 25, 2020 BELGRADE, SERBIA.

Edited by

Prof. Dr. Özer Çınar

Published by:

info@icens.eu
www.icens.eu
www.cnrgroup.eu

CNR Group Laboratuvar ve Arge Hizmetleri Sanayi Ticaret Limited Şirketi Çifte Havuzlar Mah., Eski Londra Asfaltı Cad., Kuluçka Mrk., A1 Blok, 151/1C, Iç Kapı No:1 B-20, Esenler / Istanbul, 34220

SCIENTIFIC COMMITTEE

1. Prof. Dr. Adisa Parić - University of Sarajevo - Bosnia and Herzegovina
2. Prof. Dr. Ahmet Doğan – Yıldız Technical University - Turkey
3. Prof. Dr. Aleksandar Dimitrov - Ss. Cyril and Methodius University - Macedonia
4. Prof. Dr. Alexander Golub - National University of Kyiv-Mohyla Academy - Ukraine
5. Prof. Dr. Alexander Litvinenko - National University of Food Technologies (Kyiv) - Ukraine
6. Prof. Dr. Anita Grozdanov - Ss. Cyril and Methodius University - Macedonia
7. Prof. Dr. Arslan Saral – Yıldız Technical University - Turkey
8. Prof. Dr. Asif Šabanović – International University of Sarajevo - Bosnia and Herzegovina
9. Prof. Dr. Bekir Erol Ak - Harran University - Turkey
10. Prof. Dr. Cem Şensöğüt - Dumlupınar University - Turkey
11. Prof. Dr. Christos Douligeris - University of Erlangen-Nurnberg - Germany
12. Prof. Dr. Dragutin T. Mihailović - University of Novi Sad - Serbia
13. Prof. Dr. Evgeniy Shtefan - National University of Food Technologies (Kyiv) - Ukraine
14. Prof. Dr. Falko Dressler - University of Paderborn - Germany
15. Prof. Dr. Harry Miller – International University of Sarajevo - Bosnia and Herzegovina
16. Prof. Dr. Houssam Toutanji – Western Michigan University - USA
17. Prof. Dr. Ian F. Akyıldız – Georgia Institute of Technology - USA
18. Prof. Dr. İsmail Usta - Marmara University - Turkey
19. Prof. Dr. Kateryna Derevska - National University of Kyiv-Mohyla Academy - Ukraine
20. Prof. Dr. Liljana Gavrilovska - Ss Cyril and Methodius University - Macedonia
21. Prof. Dr. Lukman Thalib - Qatar University - Qatar
22. Prof. Dr. M. Asghar Fazel – University of Environment - Iran
23. Prof. Dr. Mikhailov Volodymyr - Taras Shevchenko National University of Kyiv - Ukraine
24. Prof. Dr. Mykola Glybovets - National University of Kyiv-Mohyla Academy - Ukraine
25. Prof. Dr. Muammer Koç - Hamad bin Khalifa University - Qatar
26. Prof. Dr. Nadia Bilko - National University of Kyiv-Mohyla Academy - Ukraine
27. Prof. Dr. Özer Çınar – Yıldız Technical University - Turkey
28. Prof. Dr. Perica Paunovik - Ss. Cyril and Methodius University - Macedonia
29. Prof. Dr. Rifat Škrijelj – University of Sarajevo - Bosnia and Herzegovina
30. Prof. Dr. Samir Đug - University of Sarajevo - Bosnia and Herzegovina
31. Prof. Dr. Tanju Karanfil – Clemson University - USA
32. Prof. Dr. Ümit Alver – Karadeniz Technical University - Turkey
33. Prof. Dr. Wolfgang Gerstacker - University of Erlangen-Nurnberg - Germany
34. Prof. Dr. Vladyslav Sukhenko - National University of Life and Environmental Sciences of Ukraine (Kyiv) - Ukraine
35. Prof. Dr. Yılmaz Yıldırım - Bülent Ecevit University - Turkey
36. Prof. Dr. Yousef Haik - Hamad bin Khalifa University - Qatar
37. Assoc. Prof. Dr. Alaa Al Hawari - Qatar University - Qatar
38. Assoc. Prof. Dr. Fatih Ungan - Cumhuriyet University - Turkey
39. Assoc. Prof. Dr. Izudin Dzafic - International University of Sarajevo - Bosnia and Herzegovina
40. Assoc. Prof. Dr. Kateryna Syera - National University of Life and Environmental Sciences of Ukraine (Kyiv) - Ukraine
41. Assist. Prof. Dr. Muhamed Hadziabdic - International University of Sarajevo - Bosnia and Herzegovina
42. Assoc. Prof. Dr. Nusret Drešković - University of Sarajevo - Bosnia and Herzegovina
43. Assoc. Prof. Dr. Polina Vakuliuk - National University of Kyiv-Mohyla Academy - Ukraine
44. Assoc. Prof. Dr. Senija Tahirovic - International University of Sarajevo - Bosnia and Herzegovina
45. Assoc. Prof. Dr. Victor Karamushka - National University of Kyiv-Mohyla Academy - Ukraine
46. Assoc. Prof. Dr. Victoria Konovalova - National University of Kyiv-Mohyla Academy - Ukraine
47. Assoc. Prof. Dr. Yuriy Kravchenko - National University of Life and Environmental Sciences of Ukraine (Kyiv) - Ukraine
48. Assist. Prof. Dr. Fatih Taktak - Uşak University - Turkey
49. Assist. Prof. Dr. Fouzi Tabet - German Biomass Research Center - Germany
50. Assist. Prof. Dr. Haris Gavranovic - International University of Sarajevo - Bosnia and Herzegovina
51. Assist. Prof. Dr. Sasan Rabieh - Shahid Beheshti University - Iran
52. Assist. Prof. Dr. Ševkija Okerić - University of Sarajevo - Bosnia and Herzegovina
53. Assist. Prof. Dr. J. Amudhavel - VIT Bhopal University - India
54. Dr. Zsolt Hetesi - National University of Public Service, Budapest - Hungary
55. Dr. Zsolt T. Németh - National University of Public Service, Budapest - Hungary

ORGANIZATION COMMITTEE

Chairman of the Conference

Prof. Dr. Özer Çınar – Yıldız Technical University

Members of the Committee

Prof. Dr. Ümit Alver (Co-Chairman) - Karadeniz Technical University - Turkey
Prof. Dr. Mikhailov Volodymyr - Taras Shevchenko National University of Kyiv - Ukraine
Assoc. Prof. Dr. Kateryna Syera - National University of Life and Environmental Sciences of Ukraine (Kiev) - Ukraine
Assoc. Prof. Dr. Lukman Thalib - Qatar University - Qatar
Assoc. Prof. Dr. Yuriy Kravchenko - National University of Life and Environmental Sciences of Ukraine (Kiev) - Ukraine
Assist. Prof. Dr. Sasan Rabieh - Shahid Beheshti University - Iran
Alma Ligata - Zenith Group - Bosnia and Herzegovina
Ismet Uzun - Zenith Group - Bosnia and Herzegovina
Musa Kose - Zenith Group - Bosnia and Herzegovina

WELCOME TO ICENS 2020

On behalf of the organizing committee, we are pleased to announce that the 6th International Conference on Engineering and Natural Sciences (ICENS 2020) held from October 21 to 25, 2020 in Belgrade, Serbia. ICENS provides an ideal academic platform for researchers to present the latest research findings and describe emerging technologies, and directions in Engineering and Natural Sciences issues. The conference seeks to contribute to presenting novel research results in all aspects of Engineering and Natural Sciences. The conference aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Engineering and Natural Sciences. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in all areas of Engineering and Natural Sciences. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world. The scientific program will focus on current advances in the research, production and use of Engineering and Natural Sciences with particular focus on their role in maintaining academic level in Engineering and Applied Sciences and elevating the science level. The conference's goal will to provide a scientific forum for all international prestige scholars around the world and enable the interactive exchange of state-of-the-art knowledge. The conference will focus on evidence-based benefits proven in clinical trials and scientific experiments.

Best regards,

Prof. Dr.Özer ÇINAR

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

Investigation Of Magnetic Data Of The Buyuk Menderes Graben In Western Anatolia	Turkey	16
Deriving Enhanced Magnetic Model 2017 (Emm 2017) Data For Eastern Anatolia	Turkey	17
Novel Approaches On Functional Yoghurt	Turkey	18
Why Is Pomegranate Molasses Important ?	Turkey	19
Novel 3,4,5-Trifluorophenyl-Functionalized Carbazole: Synthesis, Characterizations And Dye Sensitized Solar Cell Applications	Turkey	20
Photoelectric Characteristic Of The Silicon Photodiode With Bcp Interfacial Layer	Turkey	21
Comparison Of Power Line Communications Infrastructure	Turkey	22
Numerical Approach For Seismic Assessment Of An Existing Historical Masonry School Building	Turkey	23
Seismic Assessment Of Existing Low-Rise Rc Buildings: A Case Study	Turkey	24
Structural Rehabilitation Of A Damaged Retaining Wall: Structural Approach And Modeling	Turkey	25
Structural Rehabilitation Of A Damaged Retaining Wall: Geotechnical Approach And Modeling	Turkey	26
A Mobile Data Collection And Management System For Archaeological Excavations And Museums	Turkey	27

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

THE HEALTH RISK ESTIMATION BASED ON HEAVY METALS IN EDIBLE PLANTS FROM BOSNIAN MARKET

Aida Šapčanin[a*], Mirsada Salihović[a], Selma Korać[a], Emina Ramić[a]

[a]Faculty Of Pharmacy, University Of Sarajevo

*aida.sapcanin@ffsa.unsa.ba

Abstract:

Food safety is a global concern that covers different areas of everyday life. The present study aimed to estimate the heavy metals contamination through the health risk assessment via the consumption of 45 species of edible plants. In order to conduct the analysis of essential and toxic heavy metal occurrence in edible plants, samples have been collected from the Bosnian-Herzegovinian market (origin: eco-farms, or foreign commercial suppliers). The heavy metals Fe, Zn, Cu, Pb, Cr and Cd in edible plants were determined by flame atomic absorption spectrophotometer (FAAS). Based on the determined heavy metal levels, daily intake of metal (DIM) and health risk index (HRI) were calculated. The highest level of iron and selenium was registered in the plant Ocimum basilicum; the highest level of cobalt was registered in the plant Ocimum basilicum Purpurascens, and the highest level of zinc was registered in the plant Plantago lanceolata. The content of cadmium was detected in Physalis peruviana, Brassica oleracea var. Italica, Phoenix dactylifera, Foeniculum vulgare, and Valerianella locusta plants, while the highest content of lead was detected in the plant Hypericum perforatum. The finding of this study regarding DIM and HRI showed that the consumption of edible plants from the Bosnian-Herzegovinian market was nearly free of risks for all investigated heavy metals. This study suggests monitoring of heavy metals in edible plants to prevent long term consequences to human health.

Keywords: Edible Plants, Metal Accumulation, Health Risk Index, Health Risk Assessment

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

ACCUMULATION OF HEAVY METALS BY DIFFERENT MUSHROOMS FROM BOSNIA WITH RESPECT TO THE HEALTH RISK ASSESSMENT

Aida Sapčanin[a*], Mirsada Salihović[a], Selma Korać[a], Emina Ramić[a]

[a]Faculty Of Pharmacy, University Of Sarajevo

*aida.sapcanin@ffsa.unsa.ba

Abstract:

Heavy metals may enter the food chain as a result of their uptake by edible mushrooms, it is necessary to assess the levels of heavy metals and to report possible contamination that would represent a health hazard. Selected wild edible mushroom species Cantharellus cibarius, Amanita cesarea, Boletus edulis, Craterellus cornucopiodes and Macrolepiota procera, were collected from the northwest part of Bosnia. The quantitative determination of heavy metals: As, Pb, Cd, Cr and Co was carried out by atomic absorbance spectrophotometry (AAS). Based on the investigated elements, daily intake of metal (DIM) and health risk index (HRI) were calculated. The ranges of metal content As, Pb, Cd, Cr and Co (ppb) were in the ranges from: 2388 to 29,7; 29,4 to 10,7; 110,6 to 55,1; 499 to 167 and 4782 to 130, respectively. Data showed that all the edible mushrooms from Bosnia contained heavy metals, the levels of which varied among species. Furthermore, the estimated weekly intake of heavy metals was calculated and compared with the WHO/FAO provisional tolerable weekly intake. Even though different studies promote consumption of mushrooms, especially as supplementary food for the ageing population, precautions should be taken to ensure long-term mushroom consumption and to avoid excessive heavy metals accumulation.

Keywords: Mushrooms, Metal Accumulation, Health Risk Index, Health Risk Assessment

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

INVESTIGATION OF LIVE-BED SCOUR AROUND CIRCULAR BRIDGE PIERS UNDER FLOOD WAVES BY USING FLOW3D

Firat Gumgum[a*], Mehmet Sukru Guney[b]

[a]Dicle University
[b]Izmir University Of Economics

*firatgumgum@hotmail.com

Abstract:

In this study, an experiment concerning live-bed scour around circular bridge pier under unsteady flow conditions and its simulation performed by using the software FLOW3D are presented. Different turbulence models such as LES, RNG and two equations k-ε were tested separately and their effects on scour process were compared to each other, together with experimental findings. It was revealed that the LES turbulence model simulated better the scour around the pier while the RNG turbulence model simulated better both the scour in the wake region and the sediment transport. All of these three turbulence models underestimated the scour depths compared to the experimental ones.

Keywords: Local Scour, Live Bed, Unsteady Flow, Flow3d

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

SIMULATION OF THE COTTON THISTLE BIODIESEL PLANT

Marija B. Tasic[a*], Milan D. Kostić[a], Olivera S. Stamenković[a], Vlada B. Veljković[a]

[a]University Of Nis, Faculty Of Technology

*marijat14@yahoo.com

Abstract:

Weeds can aggressively take advantage of human-disturbed environments, so its growth control is essential. Cotton thistle (Onopordum acanthium L.) is a weed, which seed is rich in oil. Utilization of cotton thistle seed oil for biodiesel production can be an effective weed control method. The goal of this study is to develop a flow-sheet simulation model to assess the feasibility of cotton thistle biodiesel plant. A model was heuristic, and it was simulated using Aspen Plus (V7.3.1). Reliable thermodynamic property data, operating conditions, and process unit efficiencies were based on experimental data published elsewhere. Plant capacity was 7000 metric tonnes/year biodiesel. Waste water rich in glycerol was 12% per plant capacity, while seed press cake may be sold as cattle feed. This study showed that the large-scale production of biodiesel was unfeasible due to the high price of cotton thistle seed and ineffective pressing oil extraction technique.

Keywords: Aspen Plus, Biodiesel, Cotton Thistle, Feasibility, Seed

[*]This work has been funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Project

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

KINEMATIC ANALYSIS AND OPTIMIZATION OF SCRAP HANDLING MACHINE CRANE

Cagatay Yeldar Yildirim[a*], Aytekin Yelekcioglu[a], Ramazan San[a]

[a]Aymas Makina San. Ve Tic. Ltd. Sti. R&D Department

*argemerkezi@aymasmakina.com

Abstract:

In the recycling of metal scraps, the transportation of scraps is provided by construction machinery. Construction machinery used for scrap transportation is called material handling crane. In this study; Kinematic design and optimization of handling crane with 14 meter boom span and 3.5 tons of lifting capacity has been done.

Material handling crane designs are made by using SolidWorks. As a result of the optimization studies, the most appropriate kinematic design was created.

Keywords: Scrap Handling, Kinematic Analysis, Recycling

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

CAN CONTROLLED HODGKIN-HUXLEY NEURON MODEL QUANTUM COMPUTATIONS?

Sergey Borisenok[a*]

[a]Abdullah Gul University

*borisenok@gmail.com

Abstract:

The dynamical system corresponding to the Hodgkin-Huxley (HH) neuron contains the control parameter, for instance the electrical current or other external signal, stimulating the action potential (outcome) in the axon. Choosing the appropriate shape of the control via speed gradient or alternative algorithms one can keep the system making evolution on a given 2d surface imitating a Bloch sphere for a single qubit. The controlled 4d HH system in this case involves the effects similar to the quantum phase contributions to the computational process. We provide the simple examples of the HH-based computational algorithms following the quantum paradigm. Our approach can open a new way for the practical realization of quantum algorithms and provide a new perspectives for the computational properties of artificial neural networks.

Keywords: Hodgkin-Huxley Neuron, Quantum Computation

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

TARGET REPELLER FEEDBACK CONTROL OVER THE ERGOTROPY OF QUANTUM BATTERY

Sergey Borisenok[a*]

[a]Abdullah Gul University

*borisenok@gmail.com

Abstract:

Here we discuss the model of a single-qubit based quantum battery (QB) in the form of quantum oscillator in a Markovian bath environment. For the effective control we apply here Kolesnikov's type feedback algorithm, but we re-formulate it to produce in the system a target repeller. This method makes the effective design of the control fields charging the battery; the corresponding control signals could be restored explicitly from the dynamical equations. Using this novel approach, we investigate the control over the quantum battery ergotopic characteristics, including the ergotropy and the charging power. The proposed algorithm could be applied also for different physical realizations of quantum batteries: Dicke QB, spin QB, harmonic oscillator QB; and for all working stages of the QB (charging, long time storage and the energy transfer to a consumption center or engine).

Keywords: Quantum Battery, Ergotropy, Feedback Control

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

FORECASTING AUTOMOBILE SALES USING WINTERS METHOD OPTIMIZED BY GENETIC ALGORITHM

Mustafa Ahmet Beyazit Ocaktan[a*], Aslan Deniz Karaoglan[a]

[a]Balikesir University

*deniz@balikesir.edu.tr

Abstract:

The Winters method is a multi-factor demand forecasting method used when time series data show trend, seasonality and level (shift). In demand forecasting methods that use exponential smoothing like the Winters method, the estimation of smoothing parameters and initial values is a basic requirement. In this study, it is aimed to optimize the Winters smoothing parameters with genetic algorithm (GA), and thus, to improve the forecasting performance. This problem was modelled as a multi-objective continuous optimization problem by means of regression, and then GA is applied to calculate the optimum parameter values to perform prediction with good accuracy. In the modeling phase, the regression models between the factors (winters parameters) and the responses (mean absolute percentage error - MAPE, mean absolute deviation - MAD, SSE, mean squared error - MSE, and root mean squared error - RMSE) are derived, and then GA is applied to minimize the sum of weighted responses. Preliminary experiments were done on various Winters parameters by using Minitab-16. Also the mathematical modeling is performed by using Minitab-16 and then the GA optimization is performed by using Matlab. The developed method was applied on the vehicle sales data of an automobile manufacturer, and the reliability of the proposed method was tested. This study has two motivations: (i) testing the effectiveness of Winters method for car sales forecast problem, and (ii) investigate how the performance of the Winters method has changed with the use of GA. The results show that the optimization by using GA with selected weighted responses can be successfully applied to optimize the Winters parameters and significantly improves the method's forecasting performance.

Keywords: Automobile Sales, Forecasting, Winters Method, Regression, Genetic Algorithm, Optimization

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

DETAILED ANALYSIS OF MACHINE CURRENT DURING HARD TURNING OF DIN 1.2367 STEEL USING CBN

Naime Eren[a*], Fatih Hayat[a], Abidin Sahinoglu[b], Mustafa Gunay[a], Halil Eren[c]

[a]Karabuk Universitesi
[b]Manisa Celal Bayar Universitesi
[c]Cankiri Karatekin Universitesi

*naimecoskun@hotmail.com

Abstract:

The mechanization that started after the industrial revolution and the gradual increase in production significantly increased energy consumption. The increase in production has caused the materials used to increase and the durability of these materials to be highly demanded. The hardness of the materials has been increased by the heat treatment applied to the materials and the addition of elements. However, the increasing hardness has emerged as a problem that these materials make it difficult to process and increase their energy consumption. In this study, machine current values were measured to determine the energy consumption in the machining of hardened DIN 1.2367 hot work tool steel. Hard turning experiments were applied with CBN tool at three different values of cutting speed, cutting depth and feed rate. The significance levels of the cutting parameters on the machine flow were determined by applying the analysis of variance. As a result, it has been determined that the current value increases with the increase in the cutting parameter levels, but the energy consumption decreases due to the decrease in the machining time.

Keywords: DIN 1.2367, Hard Turning, Machine Current, Cbn

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

MODELLING OF SURFACE ROUGHNESS IN MACHINING OF THE HARDENED X38CRMOV5-3 STEEL BY CBN INSERT

Naime Eren[a*], Fatih Hayat[a]

[a]Karabuk Universitesi

*naimecoskun@hotmail.com

Abstract:

The damage to the environment is increasing day by day with the increasing industrialization and raw material consumption. Therefore, the use of more lasting materials in the industry can take to prevent this increase has gained more importance. In addition, the surface quality of many machine components used in industry affects their working life. In this context, surface quality criteria such as surface roughness and microhardness are modeled according to the cutting parameters or processing conditions are optimized. In this study, the change of surface roughness in the machining of X38CrMoV5-3 hot work tool steel hardened using CBN tool was analyzed. The effects of cutting speed, depth of cut and feed rate on the surface roughness were evaluated by analysis of variance. In addition, the mathematical modeling of Ra was performed by applying the response surface methodology for average surface roughness (Ra). Among the cutting parameters, it was seen that the most effective parameter on the surface roughness was the feed rate. According to the developed quadratic regression model, a strong relationship was found between the cutting parameters and the surface roughness with the regression coefficient (R2= 97.87%).

Keywords: Hard Turning, X38crmov5-3, Surface Roughness, Modeling

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

ANALYSIS OF THE CS-137 DISTRIBUTION WITHIN THE SĄSPOWSKA VALLEY OF THE OJCÓW NATIONAL PARK (POLAND) WITH REGARD TO THE CURRENT DEPOSITION AND ENVIRONMENTAL FACTORS DETERMINING THE ACCUMULATION.

Filip Jędrzejek[a*], Marcin Stobiński[a], Katarzyna Szarłowicz[a], Barbara Kubica[a]

[a]Agh University Of Science And Technology

*jedrzejek@agh.edu.pl

Abstract:

One of the most efficient products of fission reaction is an isotope Cs-137. During normal operation of nuclear power plant, the emission of this nuclide is negligible, but as a result of nuclear accidents and nuclear weapons tests, we can observe cesium activities in the environment. The half-life of the Cs-137 is significant (T1/2= 30,7 a), the cesium quantities issued in recent decades still occurs at measurable levels and could be a source potential hazard. Therefore, monitoring the level of Cs-137 activity in the environment is particularly important.

In this presentation I would like create interest in specific situation in Sąspowska Valley – part of Ojców National Park (Poland). In this part of national park, we can distinguish a specific microclimate condition which determines good accumulation for cesium isotope. To illustrate this point, it is possible to make comparison between the level of soil activity in the valley and surrounding area. On the studied area value of Cs-137 activities in soil were in range 118,2 – 536,1 Bq•kg-1 (in top layer of soil), while in surroundings the values weren't exceed 80 Bq•kg-1 (in top layer of soil). It should also be mentioned that at this latitude, probably main source of cesium in environment was the Chernobyl disaster (in 1986). Therefore, the cesium activities in surrounding (distance no more than 2 km form studied area) shouldn't be so varied.

The above-described anomaly makes the given area particularly interesting for radioecology and convenient for research on cesium accumulation in the environment.

Keywords: Cesium, Radioecology, Radiochemistry

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

DETERMINATION OF CS-137 ACTIVITIES IN AIR AEROSOLS (IN POLAND) AFTER FOREST FIRE IN THE CHERNOBYL EXCLUSION ZONE – SITE OF ELEVATED LEVEL OF RADIATION RISK.

Filip Jędrzejek[a*], Marcin Stobiński[a], Katarzyna Szarłowicz[a], Barbara Kubica[a], Alicja Skiba[a],Przemysław Furman[a]

[a]Agh University Of Science And Technology

*jedrzejek@agh.edu.pl

Abstract:

In Western Europe one the most recognizable radiation event was the accident in Chernobyl nuclear power plant (1986). The level of radiophobia has been increasing since this date, what can be seen in the media, which have been spreading fake or exaggerated news frequently.

An example of such an event was the outbreak of fire in forests of the Chernobyl exclusion zone in April 2020. The fire lasted from 4 to 29 April and devastated 20 thousand hectares of the zone, which was important for the local nature, however insignificant for rest Europe because the spike of radiation did not occurred outside the area. However, the media i.a. Poland used the situation to spread panic, in spite of the announcement published on the website of the Polish Nuclear Agency (PAA), which did not find an increased level of radioactivity in the air. The PAA radiation monitoring consists of 12 ASS-500 stations (Aerosol Sampling Station) that constantly measure the activity of radionuclides in the air. Furthermore authors of the publication also started to analyze the activity of air aerosols using an alternative method based on smog monitoring stations. The main factor for the radiation hazard is long-lived isotope Cs-137, which accumulates in the soils where it is taken up by plants. As a result of burning, it is emitted into the atmosphere, where it spreads in the form of aerosols. Aerosol samples were collected by the air quality monitoring station on filters designed for PM10 and PM2.5 dust. The activities of the Cs-137 isotope collected on the filters were then determined using Broad Energy Germanium Detector by Canberra model BE3830. In all samples that were collected from April 21 to May 5, the Cs-137 activity were not above the LLD level of 8,5 µBq/m3. Which was completely confirms the reports of the PAA, IAEA and was against the panic distributed in the media. In summary, the publication focuses on showing an alternative use of filters for smog measurements in the study of aerosol radioactivity in the air.

Keywords: Cesium, Radioecology, Radiochemistry

*"AS and PF has been partly supported by the EU Project POWR.03.02.00-00-I004/16"

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

EFFECT OF MAIN AND SIDE CHAIN LENGTHS CHANGE OF WATER REDUCING ADMIXTURE ON SETTING TIME AND COMPRESSIVE STRENGTH OF CEMENTITIOUS SYSTEMS

Muhammet Gokhan Altun[a], Hatice Gizem Sahin[a*], Ali Mardani-Aghabaglou[a], Kambiz Ramyar[b]

[a]Department Of Civil Engineering, Faculty Of Engineering, Bursa Uludag University, Nilufer-Bursa, Turkey
[b]Department Of Civil Engineering, Faculty Of Engineering, Ege University

*haticegizemsahin@gmail.com

Abstract:

Various water reducing admixtures with different properties are being produced recently. Structure of the new generation polycarboxylate-based water reducing admixtures are consisted of polyethylene main chain, polyethylene glycol side chains and carboxylate side groups. Apart from the type and usage rate of the water reducing admixtures, their chemical structures such as main chain length, side chain length and number, molecular weight, intermolecular bond structure, chemical composition affect the cementitious system properties as well . In this study, the effect of main and side chain lengths change of polycarboxylate ether-based high range water reducing admixture (WRA) on setting time, compressive strength and water adsorption capacity of the cementitious systems was investigated. For this purpose, five WRA having same ratio of anionic/non-ionic group (3.47 mol/mol), content of free non-ionic group (2.78 mol) but different main and side chain lengths were synthesized. In all of the mixtures CEMI 42.5R type cement were used as binder. Cement paste and mortar mixtures were prepared according to ASTM C305 and ASTM C109 Standards, respectively. The initial and final setting times of the cement paste mixtures were determined by Vicat apparatus. It has been observed that WRAs containing short and long main or side chains were reduced initial setting time of the cement paste. Test results demonstrated that the early and advanced age compressive strength of the mortar mixtures were not severely affected with the change of main and side chain lengths of WRA. Similar results were obtained for water adsorption test.

Keywords: Water Reducing Admixture, Main Chain, Side Chain, Setting Time, Cementitious System

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

THE ENHANCEMENT METHODS OF POLYCARBOXYLATE-BASED WATER REDUCING ADMIXTURE PERFORMANCE IN SYSTEMS CONTAINING HIGH AMOUNT OF CLAY; LITERATURE REVIEW

Hatice Gizem Sahin[a*], Oznur Biricik[a], Ali Mardani-Aghabaglou[a]

[a]Department Of Civil Engineering, Faculty Of Engineering, Bursa Uludag University, Nilufer-Bursa, Turkey

*haticegizemsahin@gmail.com

Abstract:

The gradation, shape, texture and clay content of aggregate which constitute a large part of the concrete mixture affect both the fresh and hardened state performance of concrete mixtures. The clay content of crushed aggregate is higher than that of natural one. Demand for the crushed aggregate is increasing with the development of construction industry. It is known that in the case of concrete mixtures produced by utilization of aggregate having high methylene blue value, adversities such as loss of consistency and increase in water requirement may occur. The mentioned negative situations were explained by two different mechanisms. It was reported that the presence of clay in the system impairs the dispersibility of polycarboxylate-based water-reducing admixtures (PCE). On the other hand, the polyethylene oxide (PEO) side chains of PCE which presence in the cementitious system can be depleted by it enters the interlayer of clay. Thus, the water reducing admixture demand for providing constant consistency will increase. It was emphasized by the other researchers that both the mentioned conditions negatively affect the workability of the concrete mixtures. It was recognized from the literature that various studies were conducted to eliminate these negative effects. In order to eliminate the mentioned negative effects, methods such as increasing the PCE dosage and using sacrificial agents as well as the addition of polyethylene glycol (PEG) - grafted-lignin and pure PEG to the mixture were suggested by the researchers. However, it was reported that these methods are not economical. Therefore, it was emphasized that modified PCEs, which have better performance in the system having excess clay content as well as it is more economical than the other ones, need to be synthesized. For this purpose, it was recognized from the literature that modified PCEs were synthesized with some methods like adding functional groups, changing the length and shape of their side chains. In this study, a literature survey was carried out on changing the side chain shape of PCE, which is thought to be an effective way to prevent the adverse effects of clay. It was observed from the literature that admixtures having different side-chain shapes such as MA-β-CD-AA-SMAS-TPEG with the cyclic-shaped, SPCE with the star-shaped, PCE-SF with the snowflake-shaped and PCE-Ls with the claw-shaped were synthesized. It was stated that in these modified PCE types, larger side chains are substituted with the linear-shaped one of conventional PCE. Thus, it was declared that this method reduces the admixture demand for providing constant consistency by preventing access admixture side chains to interlayers of the clay.

Keywords: Cementitious System, Clay-Polycarboxylate-Based Water Reducing Admixture Interaction, Admixture Chemical Structure, Workability

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

WIRELESS CAPSULE LOCALIZATION INSIDE THE HUMAN SMALL INTESTINE USING A PERMANENT CUBE-SHAPED MAGNET WITH ANALYTICAL MAGNETIC MODEL AND DIPOLE MODEL

Muzaffer Kanaan[a], Memduh Suveren[a*]

[a]Erciyes University

*msuveren@erciyes.edu.tr

Abstract:

Wireless Capsule Endoscopy (WCE) is a non-invasive technique used to visualize the digestive system in the human body. Many gastrointestinal (GI) system diseases such as Crohn's disease, tumor, bleeding, and polyps can be easily diagnosed with WCE. In recent years, the tendency to WCE method has been increasing especially in order to eliminate the disadvantages of traditional colonoscopy (being painful, risk of infection, completely dependent on operator skill, psychologically disturbing the patient). Here, together with the diagnosis made with the WCE technique, determining the location of the disease detected in the intestine is of great importance for the medical specialist. Therefore, this study focused on determining the position of WCE in the intestine. In this study, a cube-shaped magnet was used together with the wireless capsule, and the predicted positions of the wireless capsule in the small intestine were obtained using magnetic sensors placed in the human body model and the LM-ABC optimization algorithms. As a result, 5D (3D position, 2D orientation) localization procedure was performed with both the analytical magnetic model and the dipole model of the cube magnet and the results were compared.

Keywords: Wireless Capsule Endoscopy, In-Body Localization, LM Algorithm, ABC Algorithm, Dipole Model

[*]*This study supported by BAP program of Erciyes University with FDK-2018-7833 code.*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

INVESTIGATION OF MAGNETIC DATA OF THE BUYUK MENDERES GRABEN IN WESTERN ANATOLIA

Oya Pamukcu[a*], Fikret Dogru[b], Ayca Cirmik[a]

[a]Dokuz Eylul University
[b]Ataturk University, Oltu Vocational College, Construction Technology

*oya.pamukcu@deu.edu.tr

Abstract:

Buyuk Menderes Graben is one of the most important grabens of Western Anatolia (Turkey) and generally extends from east to west. This graben has significant seismic risk due to the activity of tectonic structures inside. There are many known geothermal resources in the Western Anatolia Region in this graben. The existence of geothermal areas with very hot waters settling in suitable environments within the earth's crust depends on factors such as a high-efficiency heat source such as the cooling magma mass, a permeable reservoir rock an impermeable cover rock, and sufficient water supply. There are many geothermal fields in the Western Anatolia Region that contain these main conditions. The most important of these many geothermal fields in our country is located in the grabens of Buyuk Menderes and Gediz and the region where they intersect. Especially in geothermal fields, magnetization decreases with the increasing temperature in the ground. In regions with this feature, decreases in magnetic anomaly values are observed. The main purpose of magnetic studies in geothermal applications is to reveal the relationship between stratigraphy, tectonic and geothermal activity of the field by interpreting the anomalies caused by rocks with magnetic properties underground. The anomalies created by the presence of magnetization in an area play a particularly important role in locating faults, intrusions and related geological structures. The magnetic method is very useful in determining the intrusions that show high magnetization. Hot fluids are displaced from the gaps created by the faults and therefore the surrounding rocks are altered. Thus, the magnetic property decreases and geothermal basins can be detected. In this study, the change of magnetic anomalies (Dokuz Eylul University Project No 2018.KB.FEN.013) belonging to Buyuk Menderes Graben was investigated by using regional magnetic anomaly values.

Keywords: Magnetic, Buyuk Menderes Graben, Geothermal, Magnetization

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

DERIVING ENHANCED MAGNETIC MODEL 2017 (EMM 2017) DATA FOR EASTERN ANATOLIA

Ilkin Ozsoz[a], Oya Pamukcu[a*]

[a]Dokuz Eylul University

*oya.pamukcu@deu.edu.tr

Abstract:

Eastern Anatolia Region can be characterised by complex tectonics. Furthermore, it is one of the most appropriate areas for studying continental collision. Height of the region respect to the mean sea level is about 2 km. Basically, geology of the Eastern Anatolia can be divided into three major tectonic events: flexure, crustal thickening and stretching. Additionally, isothermal thinning and thickening are observed regarding the asthenosphere level. In Eastern Anatolia, metamorphic massifs situated at Keban-Malatya-Bitlis Block and its northern margin. Since metamorphic massifs are exposed to high temperature and pressure, the magnetic method is appropriate for detecting these units. Moreover, Collision Related Volcanic Units (CRVU) are noted. These units can produce relatively anomalous magnetic characteristics. These units are magnetised by thermoremanent magnetization and their susceptibility is positive.

Eastern Anatolia has a distinct geology for interpretation of the magnetic data. Therefore, this area is selected in order to compare aeromagnetic data ,obtained from MTA, and model data (EMM 2017). In general, EMM 2017 satellite, marine and observatory magnetic data. EMM 2017 is created by National Centres of Environmental Information (NOAA). Data gaps are sometimes observed in EMM 2017. Globally, the minimum wavelength is 56 km. Hence, it is generally used to fill data gaps in the measured data instead of using separately.

The aim of this study is deriving EMM 2017 for the Eastern Anatolia, comparison of EMM 2017 and aeromagnetic data for the study area. Furthermore, the ability of EMM 2017 for geological interpretation will be examined in this study.

Keywords: Eastern Anatolia Region, Enhanced Magnetic Model, Aeromagnetic, CRVU, Metamorphic Massifs, NOAA.

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

NOVEL APPROACHES ON FUNCTIONAL YOGHURT

Rabia Serpil Gunhan[a*]

[a]Konya Technical University Vocational School Of Technical Sciences

*rsgunhan@ktun.edu.tr

Abstract:

Yoghurt is the one of the most popular functional food in the world. It is defined as a fermented milk product by the combination of the lactic acid bacteria, Streptococcus thermophilus and Lactobacillus Bulgaricus. Yogurt contains high quality proteins, digestible carbohydrates, calcium, magnesium, phosphorus, vitamins, etc. It has lots of benefits on human health because of comprising live and active cultures and the bioactive compounds. It is consumed as a healthy food because of their high nutritional values.It reduced weight gain, prevention of intestinal diseases, reduced risk of type 2 diabetes etc.

In recent years yogurt has been produced with fortification due to increase the demand of functional food. Functionality of yogurt has been enhanced by adding one or more components that are naturally found in the food. These additives have functionality within themselves. They have antioxidant, anti-inflammatory, antitumoral and antimicrobial, in addition to hypocholesterolemic effects. They improve the properties of newly designed functional yogurt and also increase health benefits of yogurt. Produced yogurts enriched with antioxidants such as polyphenols and carotenoids are potential carrier for antioxidant compounds. The fortified yogurt has significantly higher antioxidant activity compared to the non-enriched yogurt. In studies, functionality enhanced yogurt has been observed positive effects in many diseases such as cancer, coronary heart disease, osteoporosis and food allergy.

Yogurt is an exceptional food . It has to be consumed for healty life and balanced diet. This review emphasizes the importance of functioanal yogurt and novel approaches on functional yogurt .

Keywords: Yoghurt, Functional Food, Novel

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

WHY IS POMEGRANATE MOLASSES IMPORTANT ?

Rabia Serpil Gunhan[a*]

[a]Konya Technical University, Vocational School Of Technical Sciences

*rsgunhan@ktun.edu.tr

Abstract:

As the awareness of healthy life develops, the importance of functional foods increases. One of these foods is pomegranate molasses. It is noteworthy that the production and consumption in the Middle East and the world is increasing day by day. Pomegranate mollasses is obtained by pressing the pomegranate fruit and thickening the pomegranate juice in the open or under vacuum by heat treatment. It is a durable product because of high acidity and water soluble dry matter. It is used in soups, salads and special dishes (lahmacun, doner, meatball etc.). It has a high medical and nutritional value. It is a powerful antioxidant and rich in anthocyanins and other phenolic compounds. It has antitumoral, antimicrobial, anti-inflammatory and antidiabetic properties. With the increasing demand in recent years, it has been observed that the quality of pomegranate molasses has decreased and additives such as glucose syrup, date syrup and lemon salt have been added. Especially in pomegranate molasses produced by traditional method, there are problems such as high temperature in open boiler and not paying attention to packaging. The purpose of this review is to emphasize the importance of pomegranate molasses, to point out its difference with pomegranate sour sauce and to draw attention to the production of high quality pomegranate molasses.

Keywords: Pomegranate Molasses, Pomegranate Sour Sauces

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

NOVEL 3,4,5-TRIFLUOROPHENYL-FUNCTIONALIZED CARBAZOLE: SYNTHESIS, CHARACTERIZATIONS AND DYE SENSITIZED SOLAR CELL APPLICATIONS

Betul Derince[a], Kamuran Gorgun[a], Yasemin Caglar[a*], Mujdat Caglar[a]

[a]Eskisehir Osmangazi University

*yasemincaglar@eskisehir.edu.tr

Abstract:

Nitrogen-containing heterocyclic compounds are considered units with a privileged core structure found in many natural products and organic materials. Among these compounds, carbazoles isolated from coal tar by Graebe and Glazer in 1872 consist of two benzene rings fused to a pyrrole ring and are included in the important class of hetero-aromatics, as well as for materials with a wide variety of activities in various drugs. Chemical and thermally stable structure, easy chemical modification due to high emission efficiency, film forming ability, it is also contain rich in conjugated electrons. In addition to having an electron-donating structure, the carbazole has three active positions (C-3, C-6, and N-9) to adjust its electronic properties. On the other hand carbazole nucleus is insoluble or poorly soluble in organic solvents therefore attaching N-octyl group in carbazole increases its solubility. The Suzuki-Miyaura cross-coupling reaction emerged as one of the most powerful methods for the construction of carbon-carbon bonds. Although it is most widely used for the synthesis of sp2-sp2 linkages, the use of this reaction to form stereochemistry-bearing sp2-sp3 bonds has received widespread interest in the last decade. Carbazole derivatives are an important chemical used in organic transistors (OTFT), organic light emitting diodes (OLED) and organic solar cells. So carbazole units can also affect the HOMO level, leading to better hole transporting properties of the materials. In this study, we synthesized and designed carbazole based compound (compound IV) by Suzuki Miyaura cross-coupling reaction. This synthesized novel molecule (compound IV) has high solubility, easy to purify. All synthesized compounds (II, III and IV) were characterized by using 1H NMR, 13C NMR, UV-Vis and thermal properties. ZnO-DSSC's were fabricated using these dye molecule. The current–voltage characterization of fabricated ZnO-DSSCs was performed by AM 1.5 simulated. The short current, open circuit voltage, conversion efficiency and fill factor of ZnO-DSSCs were determined.

Acknowledgement: This work was supported by Scientific and Technological Research Council of Turkey

(TUBITAK) (Project no. 119Z638) for the financial support for carrying out this work.

Keywords: Carbazole, Suzuki-Miyaura Cross Coupling, 1H-NMR, 13C-NMR, Zno, Dssc

[*]TUBITAK Project no: 119Z638

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

PHOTOELECTRIC CHARACTERISTIC OF THE SILICON PHOTODIODE WITH BCP INTERFACIAL LAYER

Tugay Demirtas[a*], Cem Odaci[a], Umut Aydemir[a]

[a]Uludag University

*tugaydemirtasuludag@gmail.com

Abstract:

Depending on their significant properties such as low-cost production, large-area and high flexibility, the organic photodiodes have driven an important deal of attention. Also, the organic photodiodes are available to be able to offer high external quantum efficiencies. In this study, a conjugated organic molecule, bathocuproine (BCP), is benefited to manufacture a photodiode with an organic interfacial layer. The main purpose of choosing the BCP organic is related to the electrical properties and optical properties of BCP. For example, BCP restricts the movement area of the holes and creates a transport zone for electrons. The electrical characteristics and UV spectrum results of the final device are examined by coating BCP solution on n-type Si substrate as a thin film layer by using spin coater. From the I-V measurement of the device, the barrier height and the ideality factor of the BCP based photodiode are calculated as 0.78 eV and 3.038, respectively. Also, in terms of the measured light response graphs, the rising and falling times are calculated and they are approximately found as for short circuit current: 0.85 s and 0.81 s, for open circuit voltage: 0.87 s and 9.85 s, respectively. When it comes to optical properties of BCP thin film, it is coated on a glass substrate, using the same parameters as it is done for Si substrate, to measure the absorbance and transmittance values and it is found that it absorbs the light at the wavelength of 272 nm. Here, it is foreseen that the usage of the BCP as interfacial layer in researches will take an important place for the development of highly sensitive organic optoelectronic devices.

Keywords: Photodiode, Thin Film, Bathocuproine, Organic Electronics

[*]*This study is supported by Department of Scientific Research Projects, Uludag University,under the grant number of BUAPMH-2019/1*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

COMPARISON OF POWER LINE COMMUNICATIONS INFRASTRUCTURE

Bugrahan Uzun[a*], Okan Ozgonenel[a]

[a]Electrical And Electronic Engineering, Ondokuz Mayis University

*bugrauzun55@hotmail.com

Abstract:

Today, the development of technology and the increase in the number of people, the industrialization and the needs of people increase the importance of electricity consumption and thus the importance of transmission lines. It is very important to bring the consumer with energy through transmission lines, the continuity of this energy and the safety of the consumer. Since the systems used are very large and interconnected, the likelihood of errors is as high. And the response given by these systems is very important both for human health and to ensure energy continuity. The wish to quickly avoid mistakes has brought about the need to communicate and send information.

In this paper, better advantageous communication method is investigated by comparing powerline communication methods. Pros and cons of PLC method and wireless communication methods are compared. After choosing PLC as the communication method, noise, channel impedance and signal weakening problems that have negative effects of data transmission over the transmission line are examined. OSOS, SCADA, PRIME, G3 methods were compared. Modulation methods that may be suitable for transmission line communication are compared. Transmission line communication system simulation is designed with BPSK modulation method. The carrier signal, which is at very high frequencies compared to the 50Hz frequency network signal transmitted over the transmission line, is modulated with the BPSK signal. The information signal to be transmitted is sent via BPSK modulation over the transmission line. At the transmission line output, the demodulation process is applied and the information signal at the input is read at the output. PSIM is used for computer simulations and performance curves are evaluated over different PLC modulation techniques.

Keywords: Power Line Communication, Distribution Lines, Transmission Lines, Power Quality

*None

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

NUMERICAL APPROACH FOR SEISMIC ASSESSMENT OF AN EXISTING HISTORICAL MASONRY SCHOOL BUILDING

Baris Gunes[a], Baris Sayin[a*]

[a]Istanbul University-Cerrahpasa

*barsayin@istanbul.edu.tr

Abstract:

The study presents to determine the seismic performance of an existing hictorical masonry school building. Within the scope of the study, the C block of the building which consists of three blocks, was examined. In this scope, initially, field investigations including material and damage situations is performed regarding the examined building. After that, the mechanical properties of the masonry structural members are determined according to the relevant codes. The soil characteristics are obtained from the soil classification map prepared by the Istanbul Metropolitan Municipality, and seismic parameters are determined considering the location of the building and regional seismic risk map. In the next step, the structural model is prepared to represent the existing state of the structure by Midas Gen software, and the performance analysis is performed using the linear elastic analysis method. The response spectrum analysis method was chosen to consider the contributions of different modes. As a result of the school building being a historical structure, the seismic performance assessment was based on “Guidelines for the Management of Earthquake Risks in Historical Buildings of 2017”. The importance level and performance target of the building was decided by the local administration. Earthquake loads are calculated according to Turkey Building Earthquake Code 2018 and was considered in the structural model. As a result of analysis, it is determined that the current status of C block not provided “Controlled Damage” performance level for DD-2 Earthquake Ground Motion Level for an earthquake with a 10% probability of exceedance in 50 years”. The strength and displacements of the masonry walls in this block were obtained beyond the limit values given for the target performance level.

Keywords: Historical Masonry School Buildings, Seismic Performance, Linear Analysis

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

SEISMIC ASSESSMENT OF EXISTING LOW-RISE RC BUILDINGS: A CASE STUDY

Baris Gunes[a], Baris Sayin[a*]

[a]Istanbul University-Cerrahpasa

*barsayin@istanbul.edu.tr

Abstract:

Modern and durable structures can be built depending on the developing materials and construction technologies. However, this is not possible for existing structures. Considering the losses occurring in time due to different reasons in the construction quality and material strength of the existing buildings during the construction period, it is necessary to determine the structural safety of these structures. This situation becomes even more critical, especially in areas prone to earthquake risk. It is a necessity to determine the earthquake safety of the existing structures in these areas with advanced analysis methods and to take the necessary repair / strengthening measures. The presented study covers the determination of the earthquake performance of an existing RC structure built as a residential building with advanced analysis methods based on the current regulations. In this scope, firstly, the existing building's structural system, geometry, layout and material properties were determined by site surveys and lab studies to evaluate its seismic performance level. Secondly, the building was modelled by Midas Gen finite element software. In the analysis model, fiber hinges were assigned to the columns, and lumped hinges were assigned to the beams. In the last stage, the numerical simulations of the building is performed by modal analysis and pushover analysis to determine the seismic performance levels of before- and after- the excavation according to the current Turkish Building Earthquake Code (TBEC 2018). The maximum and minimum strain values formed in the column and beam cross-sections were calculated by the curvature values obtained from the related members' assigned hinges. It is concluded that the case study will present an approach for the determination of the seismic performance of existing RC buildings.

Keywords: RC Buildings, Seismic Performance, TBEC 2018

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

STRUCTURAL REHABILITATION OF A DAMAGED RETAINING WALL: STRUCTURAL APPROACH AND MODELING

Baris Gunes[a], Cihan Oser[a*], Baris Sayin[a]

[a]Istanbul Universitesi-Cerrahpasa

*oser@istanbul.edu.tr

Abstract:

Retaining walls are rigid structures built to support the natural or back filling soils at different elevations. Although these type of walls are generally composed of reinforced concrete walls or gravity stone walls, geosynthetic renforced wall systems are also frequently preferred in recent years. Geosynthetic reinforced walls are defined as a composite wall system constructed by mechanically compacting the geosynthetic reinforcement material placed between the back filling soil layers behind the wall. The quality of the backfill behind the wall and the availability of water are very important in geosynthetic reinforced walls as in general of retaining structures. Applications that are not compatible with static calculations may cause the wall to be exposed to loads higher than the design loads due to the inability to remove the water. As a result of this situation, it is possible to encounter visible damage to the structure. In the presented study, it is described that the structural rehabilitation of a high geosynthetic reinforced wall constructed in two stages. Damages occurred on the examined wall due to the reasons mentioned above and thus the necessity of repair / strengthening emerged. In this context, a new RC retaining wall with piled and buttresses was designed in front of the lower level of the wall. The new wall has been modeled in Midas GEN software, and the segments of the new wall, foundation and buttresses were modelled with “Plate” elements, and piles were modelled with “Frame” elements. p-y, t-z and Q-z springs calculated according to the soil structure were used to reflect the interaction between pile-soil. The nonlinear load-displacement behavior of the springs is applied to the pile points in the analysis model. The strength and bearing strength of the walls, buttresses, foundations and piles were checked by nonlinear analysis. The presented study is expected to be a useful tool in terms of determining the method to be applied in the design of retaining walls under earthquake and service loads and the parameters to be taken into account for the rehabilitation of an existing retaining structure.

Keywords: Retaining Wall Hazards, Structural Rehabilitation, Structural Modeling Technique

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

STRUCTURAL REHABILITATION OF A DAMAGED RETAINING WALL: GEOTECHNICAL APPROACH AND MODELING

Cihan Oser[a*], Baris Gunes[a], Baris Sayin[a]

[a]Istanbul Universitesi-Cerrahpasa

*oser@istanbul.edu.tr

Abstract:

Retaining walls are rigid structures built to support the natural or back filling soils at different elevations. Although the type of walls is generally composed of RC walls or gravity stone walls, geosynthetic reinforced wall systems are also frequently preferred in recent years. Geosynthetic reinforced walls are defined as a composite wall system constructed by mechanically compacting the geosynthetic reinforcement material placed between the back filling soil layers behind the wall. In this presented study, applications that are designed to strengthen and to increase the stability of a damaged high geosynthetic reinforced wall that was built in two stages are described. Within the scope of the study, a new RC retaining wall with piles and buttresses was designed in front of the lower part of the existing geosynthetic reinforced wall. Plaxis 2D and 3D finite element analysis software were used to determine the increment at the stability of the existing retaining system and to calculate the displacements of the current wall. Eleven-earthquake records were studied in accordance with Turkish Earthquake Building Code-2018 in order to calculate the stability, the displacements, and the internal forces of the piles under the foundation of newly designed reinforced concrete retaining wall. This study is expected to be a useful tool to reveal the parameters that should be taken into consideration in the seismic performance of the retaining walls that are going to be constructed to strengthen an existing retaining structure.

Keywords: Retaining Walls, Seismic Performance Analysis, Finite Element Analysis, Turkish Earthquake Building Code-2018

*

ICENS 6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
October 21-25 2020 Belgrade

A MOBILE DATA COLLECTION AND MANAGEMENT SYSTEM FOR ARCHAEOLOGICAL EXCAVATIONS AND MUSEUMS

Mehmet Erkan Yuksel[a*], Husyein Fidan[a]

[a]Burdur Mehmet Akif Ersoy University Department Of Computer Engineering

*erkanyuksel@mehmetakif.edu.tr

Abstract:

Developments of information technologies, which create significant changes in social and economic life, also affect cultural life. Museums, which are between the most important components of society, have been affected by technological developments. Some concepts related to information technology have begun to be seen in literature last decades such as a digital museum, virtual museum, virtual tour, and electronic visitor guide. Although developed technologies offer great opportunities, researches on museums generally focus on visitor-oriented technologies. Studies linking the excavation process, archaeological findings, and the museum management system are rarely encountered. However, this issue is important for monitoring archaeological findings through all processes efficiently. In this study, three systems that operate in relation to the recording of the archeological findings in the site, effective museum management, and presentation of findings for visitors have been developed. Rfid and QR codes have been used for the relational process of these systems. It was ensured that data from different locations of archeological sites were collected in a database. Regional excavation data have been integrated by increasing the opportunity to obtain information for experts working in the same excavation area. Besides, the developed system will allow relational analysis between different excavation areas in the same region.

Keywords: Digital Archeology, Smart Museum, RFID, QR Codes, Mobile Application

*

ICENS

6TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCES

www.icens.eu