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Prepared By
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*Let's meet in İstanbul.
Where the continents meet!*



PREFACE

In the current information age, data is the basis of all intelligent systems. From the agricultural society to the industrial society, from there to the information society, the transformation process is moving towards Industry 4.0. The ability to store and process large amounts of data on computers has led to an increase in the capabilities of the products and services produced. The statistical and artificial learning studies based on meaning deriving from data have paved the way for intelligent systems in all sciences.

3rd International Conference on Data Science and Applications (ICONDATA'20) has been organized on June 25 - 28, 2020 as online.

The main objective of ICONDATA'20 is to present the latest data based researches from all disciplines. This conference provides opportunities for the different areas delegates to exchange new ideas and application experiences face to face, to cooperate between different disciplines from both natural and social sciences and to find global partners for future collaboration.

All paper submissions have been blind and peer reviewed and evaluated based on originality, technical and/or research content/depth, correctness, relevance to conference, contributions, and readability.

20 selected papers presented in the conference that match with the topics of the journals will be published in Data Science and Applications and Veri Bilimi Dergisi.

In particular I would like to thank Prof. Dr. Tamer DODURKA, Rector of İstanbul Rumeli University and Prof. Dr. Suat CEBECİ, Rector of Yalova University.

Looking forward to see you in ICONDATA 2021,

Dr. Murat GÖK

Editor

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CONTENTS

Analysis of Fading Time Data of Glow Curve by Using Artificial Neural Network	1
Assesing Math Anxiety Levels of Business Administration Students: A Private University Sample	2
Contribution of Databases of Solar Radiation on The NET and Meteorological Database for The Calculation of The Different Components of Solar Radiation	3
Algerian Coastal Zones Wind Variability.....	4
Forecasting Natural Gas Consumption Using Machine Learning Techniques	5
Application of Particle Swarm Optimization for The Portfolio Optimization Based on The Treynor Index	6
Hydrogen Peroxidase Based Enzyme Based For 3,3' 5,5' –Tetramethylbenzidine (TMB) Analytical Applycations	7
Co(II) Ions Based on Hydrogen Peroxysase Mimic for ,3' 5,5' –Tetramethylbenzidine(TMB) Substrate Analytical Applications	8
Prediction of Academic Achievements of Secondary School Students with Educational Data Mining Methods.....	9
Estimation of Student Achievement with Machine Learning Methods in the Transition from Secondary to High School in Bilecik	10
Smart Agriculture: Classification of Fruits by Using Deep Learning Models	12
A Multiple Criteria Analysis of the Factors Affecting Job Satisfaction of Research Assistants in Turkish Private Universities	13
Detection of Lesions on Mammogram MR Images	14
An Estimation Application with Multivariate Regression Models on the World Happiness Report	15
Career Perception and Future Expectation of Generation Y: KocaeliOrganized Industrial Zone Case	16
An Overview of Design Principles According To Aesthtetics and Ergonomics	17
Examination of Feature Selection Methods in a Similarity Based Prognostics Approach for Remaining Useful Life Estimation.....	18
Effects of Cluster Coefficient Based Mutations on Average Cluster of Synthetic Networks.....	20
The Impact of Consumer Preferences and Habits on the Food Production in Turkey: Peanut Butter Case.....	21
Evaluation of The Wharton Jelly-Derived Mesenchymal Stem Cells Transaction with B Mercaptoetanol.....	22
Statistical Analysing Berth-Vessel Relationship For A Container Port.....	23
Evaluation of the Effect of Platelet Rich Plasma (PRP) in Semen Samples Prepared by Simple Washing Method ...	24
Detection of Wrong Way Drivers.....	25
Molecular Dynamics and binding studies for Piperazine and Morpholine Substituted Quinolines with GAK.....	26
A preliminary study on Mobile Monitoring System for Intervention and Tracking after Traffic Accidents.....	27
Modeling Solar Radiation through Stochastic Markov Chain.....	28
Modeling of The Risk of Introduction of Non-Native Species To The Port of Arzew by Biofouling on The Ships Hull, Between 2013 and 2016.....	29
Anomaly Detection Based k-Nearest Neighbour Algorithm in Energy Optimization of High Storage Systems.....	30
The Impact of Web Search Engines on the Text Mining.....	31
Real-Time Processing of IoT Data	32
A Novel Variable Selection Approach in Microbiota 16S rRNA Data Analysis.....	33
Classification of Tweets About Disasters with BERT Model	34

Vehicle Detection OnAerial Imagery As Small Object Detection Difficulty	35
Hybrid Meta-Heuristic Algorithm for Solving Bin Packing Problem 3D.....	36
Machine Learning with Software Test Effort.....	37
Effect of Dimension Reduction on The Performance of Fuzzy Clustering Methods	38
An Application of Risk Evaluation for Herniated Disc.....	39
Malware Detection in Android OS.....	40
Stock Market Forecasting Using Deep Learning Method	41
Edge, Fog and Cloud Computing: Offering Strong Computing	42
Granulometric Indices Cartography for Beach Characterization: Influence of Coastline Changes and Hydrodynamic Factors	43
The Impact of Data Mining and SaaS-Cloud Computing	44
Contentment Analysis of Telecom Customers in Turkey	45
Red Point Detection with 6 Axis Robot Arm.....	46
Classification of BIST 100 Stock Index Movement Using Data Mining Techniques.....	47
Effect of $A\beta$ on the Probability of Molecule Reception in MCvD	48
Fuzzy Two-Way ANOVA and An Application	49
Predicting Fuel Consumption by Machine Learning with Reverse Engineering on Can-Bus Data	50
Determining the Case Profile in the COVID-19 Outbreak by Association Methods.....	51

Analysis of Fading Time Data of Glow Curve by Using Artificial Neural Network

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Abstract

When an insulator or semiconductor is thermally stimulated, a luminescence phenomenon can occur this known as thermoluminescence. Fading is the process in which there is unintentional loss of the latent information, that is, its response. There are many causes of the process of fading, but the thermal is the main one. Dental ceramics are thermoluminescent dosimetric materials which are commonly used for dose estimation. Artificial Neural Network (ANN) method is also an effective method for dose estimation and prediction of fading time by using TL glow curve of quartz crystals. In this study, a novel ANN model is proposed to analyze and predict the fading time of experimental data of quartz crystals. In this ANN model, network type is chosen as feed forward back propagation algorithm and results are obtained with 68 epochs. Levenberg Marquardt are also used for training of the proposed ANN model.

Keywords: *Luminescence, Fading time data, Artificial neural network*

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İşletme Fakültesi Öğrencilerinin Matematik Kaygı Düzeylerinin Değerlendirilmesi: Özel Üniversite Örneği

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Özet

Bu araştırmanın amacı, pandemi sürecinde üniversite öğrencilerinin matematik kaygılarının incelenmesidir. Araştırmanın evrenini 2019-2020 eğitim-öğretim yılında Haliç Üniversitesi İşletme Fakültesi'nde öğrenim gören üniversite öğrencileri, örneklem grubunu ise, bu evrenden seçilen 6 farklı anabilim dalında öğrenim gören 329 öğrenci oluşturmuştur. Araştırmada, öğrencilerin matematik kaygılarını belirlemek için Akçakın, Cebesoy ve İnel (2015) tarafından Türkçe'ye uyarlanan Matematik Kaygı Ölçeği, kullanılmıştır. Araştırmanın sonucunda, öğrencilerin matematik kaygı düzeylerinin bölümlere göre değiştiği saptanmıştır. Ancak, öğrencilerin matematik kaygı düzeylerinin cinsiyet ve sınıf düzeyine göre istatistiksel olarak anlamlı bir farklılık olmadığı tespit edilmiştir. Ayrıca, matematik kaygı düzeyi ile öğrencilerin not ortalamaları arasında negative bir ilişki saptanmıştır. Yapılan bu çalışmanın, İşletme Fakültesinde öğrenim gören üniversite öğrencilerinin matematik kaygılarının anlaşılmasında literatüre önemli bir katkı sunacağı ve öğrencilerin matematik kaygılarının azaltılması için atılacak adımlarda ilgililere fayda sağlayacağı düşünülmektedir.

Anahtar Kelimeler: Matematik, Matematik kaygısı, Matematik başarısı, İşletme fakültesi öğrencileri

Assesing Math Anxiety Levels of Business Administration Students: A Private University Sample

Abstract

The aim of this study is to investigate the college students' math anxiety levels. The population that was chosen for this study was students who attend the Faculty of Business at Halic University in 2019 - 2020 academic years. Sample of the study included 329 students who study six different majors in the Faculty of Business Administration. The Math Anxiety scale developed by Akçakın, Cebesoy and İnel (2015) was used as the data collection instruments in the study. The results showed that students' math anxiety levels changed according to the departments. However, there was no statistically significant difference in math anxiety levels of students according to gender and grade level. In addition, a negative relationship was found between math anxiety level and students' grade point averages. This study will make an important contribution to literature in understanding the mathematics anxiety of college students studying at the Faculty of Business Administration and will benefit those authorities who will take steps to reduce students' math anxiety levels.

Keywords: Mathematics, Mathematics anxiety, Math performance, Faculty of business, Administration students

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Contribution of Databases of Solar Radiation on The NET and Meteorological Database for The Calculation of The Different Components of Solar Radiation

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Abstract

For the calculation of the energy balance at the soil-atmosphere interface it is interesting to know several physical parameters. Since the 1980s, researchers have developed models and techniques for transforming satellite images into radiation components. Several databases of radiation components exist in net. We were interested in comparing these results with the ground measurements. In this work, we will limit ourselves to comparing the following two measurements, the global radiation and the insolation measured on the ground with the cloud cover rate and the global satellite radiation. First, we have developed a software that allows us to access and extract data quickly and according to several criteria. Secondly, the meteorological and radiation data measured on the ground are put in the same database. Statistical methods have revealed to us that the rate of satellite cloud cover varies randomly compared to the insolation measured in situ. This result shows us that the orientation of observation is important and therefore it is not possible to calculate direct radiation from satellite data. On the other hand, the correlation coefficient between global daily satellite radiation and the global radiation measured in situ is around 92%. By using the correlation direct radiation as a function of the global radiation measured on the ground implicitly we can determine this component using the data from the existing database on the NET.

Keywords: *Data base net, Statistical analysis, Radiations Measured*

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Algerian Coastal Zones Wind Variability

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Abstract

Algerian coastal areas have an important wind potential, yet far from being fully exploited. Because wind resources vary from year to year, the wind speed variability is a key component of the overall uncertainty in the wind resource assessment process, thereby creating challenges for wind farm operators and owners. This problem leads to questioning both the validity of the assessment methods and the wind variability. In this preliminary work tackles the second issue with investigates the variability of wind speeds, in order to understand how this variability may be contributed to the under-production and so that it is better taken into account in the future. We present results of a study on the variability of wind speeds across Algerian coastal zones over the past 60 years, making use of data sets from surface recordings at Algerian meteorological stations. The means and standard deviations of daily wind speeds, and the Weibull-distribution parameters, show the expected features, such as the strong, highly-variable wind in the Arzew area. We do not find any clear, strong long-term trends in wind speeds across Algerian coastal zones, and the variability between decades is large. We examine how different years and decades are related in the long-term context, by looking at the ranking of annual mean wind speeds. Picking a region covering western coastal Algeria as an example, our analyses show that the wind speeds there over the past ~ 20 years are within the range expected from natural variability, but do not span the full range of variability of the 60-yr data set. The calendar-year 2010 is however found to have the lowest mean wind speed on record for this region. Overall, we have shown that long-term data sets are essential in understanding wind speed distributions across Algerian coastal areas.

Keywords: *Algerian coastal areas, Wind resource, Surface wind, Wind speed, Wind variability*

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Forecasting Natural Gas Consumption Using Machine Learning Techniques

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Abstract

In the world, the demand for different kinds of energy increases with industrialization. It is known that one of the most used energy sources is natural gas. The increase in natural gas consumption triggers a rise in carbon emission and air pollution. Therefore, especially the studies in this field have great importance in terms of planning, managing, protecting, and maintaining energy consumption. Besides, we believe that supply and demand management would be carried out more efficiently through these studies. In this study, we established different models and estimated natural gas consumption by using natural gas consumption data from 2013 to 2018. Before model techniques and requirements, there are significant factors such as climate, holidays, and square meters of buildings in natural gas consumption. This paper aims to estimate the daily natural gas consumption and to extract the meaningful features that affect the estimation. When determining the accuracy of the models, we used the R2 score as an evaluation criterion. We developed our model on the Random Forest, Xgboost, and Super Learner algorithms by using different training and test dataset. Among these models, the Super Learner model, which combines the best results of 10 different machine learning models, gave the best accuracy rate.

Keywords: *Estimation of natural gas consumption, Machine learning, Xgboost, Random forest, Super learner*

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Application of Particle Swarm Optimization for The Portfolio Optimization Based on The Treynor Index

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Abstract

All of the financial resources available to the investor are called portfolios. From past to present, the investor is looking for an investment tool that will provide the maximum benefit by considering the economic conditions of the day. The investor expects a minimum risk for maximum benefit. This situation led to portfolio optimization problems. In recent years, unlike classical methods, artificial intelligence methods are observed to give better results in portfolio optimization problems. In this study, portfolio optimization is aimed at using the Particle Swarm Optimization algorithm on 1-year BIST-30 data. As a result of portfolio optimization with the Particle Swarm Algorithm, the number of stocks, the intra-portfolio weight ratios of the stocks, the portfolio risk, the expected return of the portfolio, the portfolio beta and the Treynor index values are found. Among the portfolio types obtained, the portfolio with the highest Treynor index value is determined as the optimum portfolio.

Keywords: Portfolio optimization, Particle swarm optimization, Treynor index

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Hidrogen Peroxidase Based Enzyme Based For 3,3' 5,5' -Tetramethylbenzidine (TMB) Analytical Applications

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Abstract

The use of 3,3' 5,5' tetra methylbenzidine (TMB) for substrate as a electrochemical and studies of microplate reader for analytcal applications was studied. HRP activity has been detected using flow injection analysis at a carbon paste electrode for working electrode polarised at between -0.5 V -0.5 V versus mercury elecrode and as a counter electrode Pt in 0.1 M KCl + citrate +phosphate buffer at 5.5 pH. The optimum concentrations were 0.2 mM TMB and 0.1 mM H2O2. The detection limit obtained after 20 minutes of incubation was 38 uL 2500 unite HRP addition for electrochemical studies. This limit was lower than that obtained using as HRP substrate and comparable to that with the KCl + citrate +phosphate buffer system. Better performance was achieved with aperomeetric than spectrophotometric detection using TMB in competitive microplaate reader for somperation with voltamogram method.

Keywords: 3 3 5 5 Tetramethylbenzidine (TMB), HRP, Electrochemical studies microplate reader

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Co(II) Ions Based on Hydrogen Peroxysase Mimic for ,3' 5,5' – Tetramethylbenzidine(TMB) Substrate Analytical Applications

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Abstract

The use of 3,3' 5,5' tetra methylbenzidine (TMB) for substrate as a electrochemical and studies of microplate reader for analytcal applications was studied. Cobalt (II) ions of activity has been observed like as hidrogen peroydase acting and detected using flow injection analysis at a carbon paste electrode for working electrode polarised at between -0.5 V -0.5 V and 50 scan rate versus mercury electrode and as a counter electrode Pt in 0.1 M KCl + citrate +phosphate buffer at 5.5 pH. The optimum concentrations were 0.2 mM TMB and 0.1 mM H2O2. The detection limit obtained after 20 minutes of incubation was 50 uL 12.8 mMCo(II) addition for electrochemical studies. This limit was lower than that obtained using Co(II) for TMB substrate and comparable to that with the KCl + citrate +phosphate buffer system. Better performance was achieved with aperometric than spectrophotometric detection using TMB in competitive microplaaate reader for somperation with voltamogram method.

Keywords: 3 35 5 Tetramethylbenzidine (TMB), Cobalt (II), HRP, Electrochemical studies, Microplate reader

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Eğitsel Veri Madenciliği Metodları ile Ortaokul Öğrencilerinin Akademik Başarılarının Kestirimi

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Özet

Eğitsel Veri Madenciliği, öğrencileri ve öğrenme ortamlarını daha iyi anlamak, daha derin bir eğitim olgusu anlayışı elde etmek için eğitim ortamlarından gelen veri türlerini kullanarak yöntemler geliştiren yeni bir disiplindir. Eğitsel veri madenciliği, bilgisayar bilimi, eğitim ve istatistik alanlarının birleşimi olarak düşünülebilir. Bu çalışmanın amacı, öğrencilerin demografik özelliklerinin ve sosyo- ekonomik durumlarının öğrencilerin yıl sonu genel başarı ortalamalarına olan etkilerini eğitsel veri madenciliği yöntemleri ile analiz etmektir. Bu amaçla, 2018-2019 eğitim-öğretim yılı, 2.Dönemi'nde, Yalova ilinde sosyodemografik açıdan farklı 4 resmi ortaokuldaki, 5.6.7.8. sınıf, 1395 ortaokul öğrencisinin, E-Okul Yönetim Bilgi Sisteminden sosyodemografik özelliklerine ilişkin verileri elde edilmiştir. Daha sonra elde edilen verilerden sınıflandırma teknikleri ve algoritmaları ile yıl sonu genel başarı ortalamaları tahmin edilmiştir. Sınıflandırıcı algoritmaların uygulanması sonucunda yıl sonu genel başarı ortalaması başarımında lojistik algoritması en iyi tahmini gerçekleştirmiştir.

Anahtar Kelimeler: Eğitsel veri madenciliği, Ders başarı ortalaması tahmini, Sınıflandırma, Lojistik

Prediction of Academic Achievements of Secondary School Students with Educational Data Mining Methods

Abstract

Educational Data Mining is a new discipline that develops methods by using data types from educational environments to better understand students and learning environments, and to gain a deeper understanding of education. It can be thought of as a combination of educational data mining, computer science, education and statistics. The aim of this study is to analyze the effects of demographic characteristics and socioeconomic status of students on the overall average success scores of students by using educational data mining methods. For this purpose, in the 2018-2019 academic year, in the second term, 4 socio-demographically different 4 formal secondary schools in Yalova province, 5.6.7.8. class, 1395 middle school students, e-School Management Information System data on socio-demographic properties were obtained. Afterwards, the average of year-end overall performance with classification techniques and algorithms was estimated. As a result of the application of classifier algorithms, the logistic algorithm has achieved the best estimation in the performance of the end-of- year overall success average.

Keywords: Educational data mining, Course success average estimation, Classification, Logistic

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Bilecik İlinde Ortaokuldan Liseye Geçiş Sınavlarında Makine Öğrenmesi Yöntemleri ile Öğrenci Başarısının Tahmini

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Özet

Öğretim sürecinin kalitesi öğrencilerin ihtiyaçlarının karşılanma yeteneği olduğundan öğrenci başarısının tahmini eğitim kurumları için gereklidir. Bu anlamda öğrencilere ait önemli veri ve bilgiler düzenli olarak toplanıp çoklu sınıflı makine öğrenmesi yöntemleri kullanılarak çıkarılan sonuçlar okul yönetimlerinde değerlendirilmeli ve eğitim kalitesini korumak ve geliştirmek için standartlar belirlenmelidir. Çalışmamız şu iki temel soruya cevap aramak için oluşturulmuştur: Ülkemizde ortaöğretim öğrencilerinin lise geçiş sınavlarındaki başarılarını etkileyen temel öznitelikler nelerdir? Lise geçiş sınavlarında öğrenci başarısını tahmin etmek mümkün müdür? Çalışmamızda kullanılan eğitim veri seti iki kaynaktan oluşturulmuştur: kâğıt sayfalara dayanan öğrenci akademik bilgileri (6. ve 7.sınıf Türkçe, Matematik, Fen Bilgisi ve Genel Başarı Ortalamaları) ve öğrencilerin demografik bilgileri ile ilgili 32 soruluk Google Forms kullanılarak 2018-2019 eğitim öğretim yılında lise geçiş sınavına girmiş olan şuan 9.sınıf öğrencileri ve halen ortaöğretimde okuyan 8.sınıf öğrencileri için olan anket çalışması. Anket çalışmasında, öğrenci performansını etkilemesi beklenen değişkenler olan çeşitli demografik, sosyal/duygusal ve kapalı sorular tasarladık. Elde edilen işlenmemiş verilerden önışleme aşamasında, öğrencilerin neredeyse %100'nün anne ve babasının sağ ve öz olması gibi bazı özellikler atıldı. Ayrıca kategorik veriler (nominal veya ordinal) sayısal verilere dönüştürülerek ham verilere bir önışleme yapıldı. Çok sınıflı makine öğrenmesi yöntemlerinin eğitimi (%80 eğitim, %20 test) için Bilecik ilinde sınav puanıyla öğrenci alan ve etiket kümesini oluşturan 4 farklı lise türünde (Refik Arslan Öztürk Fen Lisesi, Ertuğrulgazi Lisesi, Mesleki ve Teknik Anadolu Lisesi, Kız Anadolu İmam Hatip Lisesi) okuyan 117 adet 9. sınıf öğrencisine ait 32 soruluk anket ve 14 adet akademik bilgiler kullanılmıştır. Denetimli öğrenmede daha yüksek sınıflandırma doğruluğu üreten bir öznitelik alt kümesi bulmak için kullanılan temel bir araç özellik seçimidir. Bu yüzden yüksek sınıflandırıcı performansı elde edebilmek için öznitelikler, bir filtreleme yöntemi olan ileri özellik seçimi (forward feature selection) yöntemi kullanılarak en iyi bilgi veren 15 öznitelik alt kümesi elde edildi. Veri setinin eğitimi için literatürde en çok kullanılan J48, PNN, Random Forest, Decision Tree, RapTree ve Hoeffding Tree çok sınıflı makine öğrenmesi yöntemleri kullanıldı. Filtrelenmiş özelliklerle algoritmalar CCI (Doğru Sınıflandırılmış Örnekler), ICI (Yanlış Sınıflandırılmış Örnekler), Precision, Recall ve F-measure değerleri ile karşılaştırıldığında Random Forest yönteminin en iyi sonucu verdiği gözlemlendi. Elde edilen Random Forest ile ilgili sonuçlar: CCI: %83.33, ICI: %16.67, Precision: 0.894, Recall: 0.833, F-Measure: 0.84. Çalışmamız sonucunda minimum sayıda öznitelik kullanılarak sınıflandırıcıların doğruluğundaki artışın gerçekleştiği görülmüştür. Çalışmamızın devamında en yüksek doğruluğa sahip model kullanılarak halen 8.sınıfta okuyan ve Bilecik ilinde 2020 yılında yapılacak olan lise geçiş sınavına girecek 160 öğrenciye ait veriler için öğrenci başarıları tahmin edilecektir.

Anahtar Kelimeler: Eğitimsel veri madenciliği, Çok sınıflı makine öğrenmesi, Karar ağaçları, Öznitelik seçimi

Estimation of Student Achievement with Machine Learning Methods in the Transition from Secondary to High School in Bilecik

Abstract

Estimation of student success is necessary for educational institutions since the quality of the teaching process is the ability to meet the needs of students. In this sense, important data and information about students should be collected regularly and the results obtained by using multi-class machine learning methods should be evaluated by school administrations and standards should be determined in order to protect and improve the quality of education. Our study was created to find answers to two basic questions: What are the main

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features that affect the success of secondary school students in high school transition exams in our country? Is it possible to estimate student performance in high school transition exams? The educational dataset used in our study was created from two sources: student academic knowledge (6th and 7th grade Turkish, Mathematics, Science and General Achievement Averages) based on paper pages and the 32-question Google Forms related to students' demographic information in 2018-2019 academic year. A questionnaire study for 9th grade students and 8th grade students who are still studying in secondary education. In the survey, we designed various demographic, social / emotional and closed questions, which are variables that are expected to affect student performance. From the unprocessed data obtained, some features such as almost 100% of students' parents being right and concise were discarded during the preprocessing phase. In addition, categorical data (nominal or ordinal) were converted into numerical data and a preprocessing was made to the raw data. 4 different high school types (Refik Arslan Öztürk Science High School, Ertuğrulgazi High School, Vocational and Technical Anatolian High School, Female Anatolian Imam Hatip) in Bilecik province who take students with an exam score and make up the label set for the training of multi-class machine learning methods (80% education, 20% test). A questionnaire with 32 questions and 14 academic information belonging to 117 9th grade students studying). A basic tool used to find a subset of attributes that produce higher classification accuracy in supervised learning is feature selection. Therefore, in order to obtain high classifier performance, 15 attributes sub-sets were obtained using the attributes and forward feature selection method, which is a filtering method. For the training of the data set, the most used J48, PNN, Random Forest, Decision Tree, RapTree and Hoeffding Tree multi-class machine learning methods were used in the literature. It was observed that the Random Forest method gave the best results when compared with the filtered properties, algorithms CCI (Correctly Classified Specimens), ICI (Misclassified Specimens), Precision, Recall and F-measure values. Results regarding Random Forest obtained: CCI: 83.33%, ICI: 16.67%, Precision: 0.894, Recall: 0.833, F-Measure: 0.84. As a result of our study, it was seen that the accuracy of the classifiers increased by using a minimum number of attributes. In the continuation of our study, student achievements will be estimated for the data belonging to 160 students who are still studying in the 8th grade and will take the high school pass exam to be held in 2020 in Bilecik, using the model with the highest accuracy.

Keywords: *Educational data mining, Multi-class machine learning, Decision trees, Attribute selection*

Smart Agriculture: Classification of Fruits by Using Deep Learning Models

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Abstract

Smart agriculture practices have become very popular in recent years, and many researchers have sought to develop a variety of decision support systems to contribute to this area. Automatic detection of various fruits and vegetables is one of the studies in this field and development of modern artificial intelligence algorithms, especially in the field of image processing, has increased interest in these problems. In this study, some convolutional neural networks architectures such as VGG-16, VGG-19, and NASNet have been used, which showing tremendous performance in different object classification problems. We have aimed to reach the highest accuracy performance on the fruit dataset which consisting of 2441 images from three different classes. Among the three methods used, the VGG-19 algorithm provided the highest accuracy ratio of 98.6% and 91.8% accuracy in the training and test set, respectively. The results of the study show that artificial intelligence can be used in a highly functional way to create more powerful decision support systems in smart agriculture and related areas.

Keywords: *Deep learning, CNN, Image classification, Smart agriculture*

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A Multiple Criteria Analysis of the Factors Affecting Job Satisfaction of Research Assistants in Turkish Private Universities

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Abstract

One of the most important conditions for getting high performance in business life is to determine and apply what needs to be done to ensure employee job satisfaction, which has gained attention in recent years. Although these studies mostly focused on private sector employees, there is no study for Research Assistants working in private universities. In this study, this subject, which is directly related to employee performance and efficiency, was evaluated with the Analytical Hierarchy Process [1] (AHP) method, which is the most widely used and robust multi-criteria decision making method. Besides, it is aimed at providing useful ideas to the private university administrators about the points that should be emphasized in order to increase employee motivation. AHP method, which is frequently used in many problems such as estimation, order of importance, resource allocation, classification determines the importance of the criteria and the sub-criteria related to these criteria and provides the solution of multi-dimensional problems by reducing them to one dimension [1,2]. In the study, 8 private universities in Istanbul were selected and a questionnaire on job satisfaction was applied to 20 people working as Research Assistants. The data obtained from the questionnaire consisting of 8 main factors and 37 sub factors were analyzed with AHP method and the most important factors affecting job satisfaction were determined respectively. According to the results, while the two main factors that are most effective on job satisfaction are "Working Conditions" and "Management Style"; It was determined that the factors of "Acceptance" and "The Job themselves" were also effective on job satisfaction, respectively. In addition, the main factor with the least impact on job satisfaction was determined as the "Socio-Economic" factor. When we look at global weights, it is determined that the first five sub-factors that are most effective on job satisfaction are "Acceptance of your achievements and appreciation by your administrative supervisors", "Keeping the given administrative duties at an optimum level", "University's food service and quality of meals", "The work done makes you feel personal success" and "The administrative supervisors provide the necessary permits for research assistants to participate in training and development activities". Likewise, the five factors that have the least impact on job satisfaction are; "Communication / relations with the dean of the Faculty", "Problem solving style of administrative supervisors", "Making efforts to eliminate the support / problems seen from administrative supervisors", "Communication / relations with other staff of the university" and "Communication / relations with the Rector and Trustee" It was determined that there are factors.

Keywords: *Research assistant, Job satisfaction, Analytic hierarchy process(AHP)*

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Mammogram MR Görüntüleri Üzerindeki Lezyonların Tespiti

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Özet

İnsan yaşamında sık görülen kanser türlerinden biri olan meme kanseri erkeklere göre kadınlarda daha sık görülmektedir. Bu kansere neyin sebep olduğu tam olarak bilinmese de kişinin beslenme şekli, regl durumu, doğum ve doğum kontrol hapları gibi birçok nedenlerin olabileceği düşünülmektedir. Meme kanserinin erken teşhisi edilmesi tedavi sırasında oldukça önemli olmaktadır. Bunu tespit etmek için çok farklı yöntemler vardır. Bunlardan biri de Manyetik Rezonans ile görüntüleme teknikleridir. Yapılan bu çalışmada, mammogram MR görüntüleri üzerinden lezyonlar tespiti için eşikleme tabanlı (otsu eşikleme yöntemi) bir sistem önerilmiştir. Önerilen sistem ile bu alanında çalışan uzmanların teşhis ve tedavisine destek olması hedeflenmiştir. Çalışmada, Mammografi Taraması için Sayısal Veritabanı (The Digital Database for Screening Mammography – DDSM)'ından 100 adet elde edilen görüntüler üzerinde yapılan analizlerde %92.14 başarımla elde edilmiştir. Elde edilen sonuç bu alanda çalışan uzmanlara erken teşhis koymasından dolayı destek olabilecek özelliklerde olduğu görülmüştür.

Anahtar Kelimeler: Meme kanseri, Eşikleme yöntemi, Manyetik rezonans görüntüleme

Detection of Lesions on Mammogram MR Images

Abstract

Breast cancer, which is one of the common cancer types in human life, is more common in women than men. Although it is not known exactly what caused this cancer, it is thought that there may be many reasons such as the person's diet, menstrual status, birth and birth control pills. It is important to diagnose breast cancer early during treatment. There are many different methods to detect this. One of these is the imaging technique with Magnetic Resonance. In this study, a threshold-based (Otsu thresholding method) system was proposed for the detection of lesions on mammogram MR images. With the proposed system, it is aimed to support the diagnosis and treatment of specialists working in this field. In the study, 92.14% success was achieved in the analyzes performed on the images obtained from The Digital Database for Screening Mammography (DDSM). The result obtained has been found to be capable of supporting experts working in this field in terms of early diagnosis.

Keywords: Breast cancer, Thresholding method, Magnetic resonance imaging

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An Estimation Application with Multivariate Regression Models on the World Happiness Report

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Abstract

Happiness is a frequently studied topic not only in psychology but also in economics because almost all individuals in the society want to be happy and reaching happiness is considered as the main goal in individuals' lives. Happiness has been accepted as an important indicator in the shaping of social progress and public policies, especially in recent years, and hence, many researches are conducted on measuring the happiness level of individuals in the society. In addition to measuring the happiness level of individuals, determining the factors affecting happiness is very important for the decisions to be taken by the decision makers and for the effective implementation of these decisions. In this study, the results of 153 countries were compared based on the latest released "World Happiness Report 2020" data prepared by the UN Sustainable Development Goals. Factors such as GDP per capita per country, healthy life expectancy, freedom of choice, perception of corruption, social support and philanthropy were considered and their relationship with happiness score was analyzed by linear and regularized multiple regression methods (Ridge, LASSO, Elastic Net, Random Forest and XGBoost). The significance level of the factors was determined for each model and the performance comparison of models was made based on the adjusted R² and RMSE model selection criteria.

Keywords: *Happiness, Regularized regression models, World happiness report*

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Y Kuşağının Kariyer Algısı ve Gelecek Beklentisi: Kocaeli Organize Sanayi Bölgesi Örneği

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Özet

Y kuşağı nüfusu, Türkiye nüfusunun yaklaşık %32'sidir ve çoğunlukla iş hayatındadır. Y kuşağı, iş hayatında diğer kuşaklara göre farklı özellikler göstermektedir. Bu nedenle bu araştırma Y kuşağının iş hayatındaki kariyer algısı ve gelecek beklentisi konusuna odaklanmıştır. Bu amaçla, 2018 yılında, Kocaeli Organize Sanayi Bölgesi'nde çalışan, Y kuşağında bulunan bireylere, anket uygulanmıştır. Araştırmada, 271 kişinin verileri incelenmiştir. Araştırma sonucuna göre, Y kuşağı bireyleri hakkında ulaşılan bulgular şunlardır: Motivasyon, teknoloji ve sosyalleşme, iş ortamı ve iş değiştirme boyutları cinsiyete bağlı olarak farklılaşmaktadır. Uyum, teknoloji ve sosyalleşme, ortam ve iş değiştirme boyutları eğitim düzeylerine bağlı olarak farklılaşmaktadır. İş ortamı boyutu, işyerindeki pozisyona bağlı olarak farklılaşmaktadır. Kariyer algısı ve gelecek beklentisi yaş, çalışma saati ve toplam iş tecrübesi boyutlarına göre farklılaşmamaktadır.

Anahtar Kelimeler: Y kuşağı, Kariyer algısı, Gelecek beklentisi

Career Perception and Future Expectation of Generation Y: Kocaeli Organized Industrial Zone Case

Abstract

The population of Generation Y is approximately 32% of the Turkey population, and they are mostly in business life. Generation Y shows different characteristics in business life compared to the other generations. Therefore, this research focuses on career perception and future expectation of Generation Y in business life. For this purpose, in 2018, a questionnaire was applied to individuals in Generation Y in Kocaeli Organized Industrial Zone. 271 people participated in the research. According to the result of the research, the following findings were determined about the Generation Y: Motivation, technology and socialization, work environment and changing job dimensions differ with respect to gender. Adaptation, technology and socialization, environment and changing job dimensions differ with respect to the level of education. The dimension of the business environment varies depending on the position at the workplace. The career perception and future expectation does not differ according to the age, working hours and total work experience dimension.

Keywords: Generation Y, Career perception, Future expectancy

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Estetik ve Ergonomiye Göre Tasarım İlkelerine Genel Bir Bakış

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Özet

Ergonomi, insanların özellikleri, yetenekleri ve ihtiyaçlarıyla birlikte, özellikle insanlar ve tasarımlar arasındaki ara yüzler ile ilgilenir. Ergonomi, tasarımları insanlara uyarlar ve deneyime dayalı tercihlerle insanları tasarımlarla özdeşleştirir. İnsanlar teknik tasarımlarla çok farklı şekillerde çalışabilir veya bunlardan etkilenebilir. Bu sebeple tasarımda ergonomi biyomekanik, fizyolojik ve psikolojik olarak ele alınmalıdır. Tasarımların çalışması ve kullanımının belirli vücut duruşlarını gerektirmesi biyomekaniğin, bu esnadaki hareketleri sağlayan statik ve dinamik kas gücü hareketleri fizyolojinin, algılama, karar verme ve hareket etme süreci ise psikolojinin konusunu oluşturur. Tasarımdaki ergonomik gereksinimler nesneye ve etkiye dayalı yaklaşımlarla değerlendirilir. Tasarım ürünleri sadece ergonomik olmamalı, aynı zamanda kullanıcılarının estetik ihtiyaçlarını da karşılamalıdır. Günümüzde birçok üründe estetik, ergonomik işlev kadar önemlidir. Makine tasarımında ergonomi ve estetiğin etkisi göz önünde bulundurularak çeşitli tasarım önerilerine bu çalışmada yer verilmiştir. Tasarımda sadece teknik çözümlerin değil, ürünün nihai görünümüne karar vermek için modeller ve prototiplerin önemi tasarım örnekleriyle açıklanmıştır. Mühendislik, üretim, satış ve dağıtım, kullanım ve geri dönüşüm aşamaları değerlendirilerek tasarımcılara önerilerde bulunulmuştur.

Anahtar Kelimeler: Makine tasarımı, Ergonomi, Estetik

An Overview of Design Principles According To Aesthetics and Ergonomics

Abstract

Ergonomic is particularly concerned with the interfaces between people and designs, along with the characteristics, abilities and needs of people. Ergonomics adapts designs to people and identifies people with designs with preferences based on experience. People can work with technical designs in many different ways or be affected by them. For this reason, ergonomics should be considered biomechanically, physiologically and psychologically. Using of designs requires certain body postures is the subject of biomechanics; static and dynamic muscle strength movements that provide the movements during this process physiology; the process of perception, decision making and acting is the subject of psychology. Ergonomic requirements in the design are evaluated with object and effect approaches. Design products should be not only ergonomic, but also meet the aesthetic needs of their users. Today, aesthetics are as important as ergonomic functions in many products. Considering the effects of ergonomics and aesthetics in machine design, various design suggestions are included in this study. In design, the importance of models and prototypes for deciding not only technical solutions but also the final appearance of the product is explained by design examples.

Keywords: Machine design, Ergonomic, Aesthetic

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Kalan Faydalı Ömür Tahmini İçin Benzerlik Tabanlı Prognostik Yaklaşımda Öznitelik Seçim Yöntemlerinin İncelenmesi

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Özet

Koşul Temelli Bakım (CBM) veya Kestirimci Bakım (PdM) olarak da adlandırılan Prognostik ve Sağlık Yönetimi (PHM), karmaşık sistemlerin sağlık durumunun teşhisine, tahmin edilmesine ve yönetilmesine odaklanan bir sistem mühendisliği disiplini. Kalan Faydalı Ömür (RUL) tahmini PHM'deki en büyük zorluklardan biridir. RUL tahmini, uçak motorları veya imalat makinelerinin kritik parçaları gibi bir sistemin sağlık durumu hakkında bilgi vermeyi amaçlamaktadır. Endüstri 4.0 ortamında günümüzün imalat sektöründe önemli bir rol oynamaktadır. Genel olarak, prognostik yöntemler üç kategoriye ayrılır. Bu yöntemler model tabanlı, istatistiksel tabanlı ve veri odaklı yöntemlerdir. Sensör tabanlı veriye dayalı yöntemler, uçak motorları ve rüzgar türbinleri gibi karmaşık mühendislik sistemleri için genellikle daha etkili yöntemlerdir. Bu çalışma, NASA tarafından sağlanan, etiketlenmemiş çok değişkenli zaman serisi verileri olarak kabul edilen halka açık turbofan motor veri seti kullanılarak gerçekleştirilmiştir. RUL tahmininde ilk ve en önemli adım, verilerin en bilgilendirici öznitelik kombinasyonunun belirlenmesidir. Literatürde, turbofan motorların RUL tahmini için, monotonluk, eğitilebilirlik ve tahmin edilebilirlik kriterleri, varyans eşiği yöntemi, Pearson Korelasyonu ve entropi ve ortakbilgiye dayalı denetimsiz bir yöntem çeşitli prognostik yaklaşımlarda kullanılmıştır. Bu çalışmada, bu öznitelik seçim yöntemlerinin etkinliğini belirlemek için, RUL tahmini için en çok kullanılan benzerliğe dayalı prognostik yaklaşım kullanılmıştır. Bu yaklaşım bir degradasyon örüntüleri kütüphanesi oluşturur, test birimlerindeki verileri kütüphanedeki örüntülerle eşleştirir ve bu eşleşen ünitelerin gerçek ömür tahminlerinin temeli olarak kullanır. Bu çalışmada sırasıyla veri seti normalize edilmiş ve üstel bir fonksiyon kullanılarak etiketlenmiştir. Daha sonra sağlık endeksi oluşturmak için öznitelik seçim yöntemi ve çok değişkenli regresyon gerçekleştirilmiştir. Benzerlik temelli yaklaşım uygulanmış ve elde edilen RUL'ların ağırlıklı ortalaması ile nihai RUL hesaplanmıştır. Ayrıca, ilgisiz öznitelikleri ortadan kaldırmak ve tahminlerin doğruluğunu artırmak için tek değişkenli F testi istatistiklerinin kullanımı önerilmiştir. MAPE değerleri, önerilen öznitelik seçim yönteminin daha iyi tahmin sonuçları ürettiğini göstermiştir.

Anahtar Kelimeler: Makine öğrenmesi, Öznitelik seçimi, Kestirimci bakım

Examination of Feature Selection Methods in a Similarity Based Prognostics Approach for Remaining Useful Life Estimation

Abstract

Prognostic and Health Management (PHM), which is also called Condition-Based Maintenance (CBM) or Predictive Maintenance (PdM) is a system engineering discipline focusing on detection, prediction and management of the health status of complex systems. Remaining Useful Life (RUL) estimation is one of the major challenges in PHM. RUL estimation aims at giving information of the health state of a system such as aircraft engines or critical parts of manufacturing machines. It's playing a significant role in today's manufacturing industry in Industry 4.0 environment. In general, prognostic methods fall into three categories. These methods are model-based, statistical-based and data-driven methods. Sensor-based data-driven methods are typically more effective methods for complex engineered systems such as aircraft engines and wind turbines. This study was carried out using publicly available turbofan engine dataset provided by NASA which is considered as unlabeled multiple multivariate time series data. The first and the most important step in RUL estimation is determining the most informative feature combination of the data. In the literature, for the RUL estimation of turbofan engines, feature selection methods such as monotonicity, trendability and

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prognosability criteria, variance threshold method, Pearson's Correlation and an unsupervised method that based on entropy and mutual information were used in several prognostic approaches. In this study, to determine the effectiveness of these feature selection methods, we used the most referred prognostic approach called similarity-based prognostic approach for RUL estimation. This approach creates a library of degradation patterns, matches the data from test units to those patterns in the library and the actual life of those matched units are used as the basis of estimation. In this study, respectively, dataset was normalized and labelled using an exponential function. Then we performed feature selection method and multivariate regression for health indicator construction. Similarity based approach was performed and final RUL was estimated through weighted sum of the obtained RULs. We also used univariate F-test statistics for eliminating irrelevant features and to increase the accuracy of estimation. MAPE values showed that proposed feature selection method produced better prediction results.

Keywords: *Machine learning, Feature selection, Predictive maintenance*

Effects of Cluster Coefficient Based Mutations on Average Cluster of Synthetic Networks

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Abstract

The network mutation can be defined as the creation of a new network with k allowed network exchanges for a G network. Synthetic networks are networks that are not aggregated from any real-life data and are created using specific rules. Synthetic nets provide an understanding of whether an observed feature is a general feature of a particular network class. Synthetic networks also often provide information on how certain properties of complex networks are derived from the rules of construction of prototype models. The clustering coefficient is a measure that is often used in network analysis and contains important information for all networks. In this study, the effects of mutations based on the cluster coefficients calculated on synthetic webs on the mean cluster coefficient of the target network are examined. Experimental studies show that different models produce different results for mutations.

Keywords: *Synthetic networks, Network mutations, Network analysis*

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The Impact of Consumer Preferences and Habits on the Food Production in Turkey: Peanut Butter Case

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Abstract

Consumer preferences play a key role in the production of ready-made food products, diversification of the products, determining their contents and creating sales channels. Food consumption habits of consumers vary depending on the production supply, needs and purchasing power. The data revealed by scientific research has an important place in shaping these habits for both producers and consumers. In this study, 109 consumers answered the survey consisting of 51 questions related to new products planned to be produced by a company that produces peanut butter. In this survey, psychological factors, socio-cultural factors, and demographic factors were taken into account in order to measure the purchasing and consumption behaviors of customers. There are also questions related to the general shopping habits of the customers, such as the frequency of purchasing a product, the effect of the product label, price, product brands, quality standards, advertising and promotion activities on the purchase. The questions which are thought to contribute to the product diversity of the peanut butter producing company and which are aimed at defining the consumers' peanut butter consumption habits, price and brand perceptions, sugar consumption, halal food, vegan products and gluten-free product demands, were put at the forefront. Different parameters such as the differences between peanut butter and peanut cream, product range, and the frequency of consumption of the product are also included. According to the survey results, the average age is 36.6; 57.2% is women and average income is 3476,4. 36.2% go shopping once a week, 37.4% go to the markets for shopping, 62.5% prefer brands, and 75.2% pay much attention to the label. Price is at the forefront for 37.9% of the consumer group, while flavor is at the forefront for 26.2%. While 62.7% of consumers prefer sugar-free products, 50.4% know the difference between paste and cream. While 26.1% of the respondents prefer coconut as dried fruit in peanut butter, 36.3% consume a 400 gram jar of paste/cream per month. 74.8% prefer chocolate creams, 46.6% peanut butter, and 41.4% sugar-free peanut butter. According to the data obtained as a result of the study, the company is expected to develop a new type of cream-containing and extra sugar-free cocoa butter and coconut. Another important point is that the explanatory phrases related to the type of product should be supported with visuals on the product label and the price should be more affordable than its competitors.

Keywords: *Peanut butter, Consumer habits, Consumer preference, Survey*

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Evaluation of The Wharton Jelly-Derived Mesenchymal Stem Cells Transaction with B Mercaptoetanol

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Abstract

Wharton jelly-derived stem cells are self-regenerative, reproducible and able to differentiated to multipotent stem cells. There may be different sources of mesenchymal stem cells (MSCs) involved in the repair mechanism of damaged tissues in the organism. No invasive procedure of their high proliferation capacity and without the waste material to be obtained from Wharton's Jelly stem cells of mesenchymal stem cells is superior to the other. Wharton jelly derived MSCs can differentiate into osteocyte, chondrocyte, adipocyte, myocyte cells; In addition, due to its neuroprotective effect on neurons, it has been shown to be effective in many neuro-regenerative treatments today. Studies have shown that MSCs are more involved in paracrine effects due to their neuroprotective effect in multiple diseases such as multiple sclerosis, acute spinal cord injury and encephalomyelitis. In experimental studies, it has been shown that intratechal MSCs transformed into neurogenic progenitor stem cells in different time periods. Our main purpose in this research is to investigate the neuronal markers of stem cells that we treated with β mercaptoethanol (BME). Within the scope of our study, we will thaw the licensed wharton gel-derived MSCs at 37°C degrees in the water bath and plant cells to flask. When the cell filling rate reached 60-70%, it was treated with BME. The effects of BME on the neuronal markers such as nestin, neuron filament light and GFAP were evaluated by removing flow from the flasks by removing the MSCs from BME media at the 1st and 3rd hours. At the end of the study, BME was shown to be more effective at the 1st hour by both flow cytometry and immune staining.

Keywords: Mesenchymal stem cell, Wharton jelly, Neuronal marker

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Statistical Analysing Berth-Vessel Relationship For A Container Port

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Abstract

The development of global trade increases the journey of goods across the world. These goods are mostly transported by containers and the usage of containers has an increase day by day. As containers can be counted and their size has international standards, they give countable datas to manage port operations. The aim of this paper is to present a statistical analysis of berth usage differences with growing vessel size in a container port. The analysis is based on the port database for 2015 and 2016 and produces various statistics of the following variables: vessel size, vessel process time, handled container per vessel and the berth number where the vessel was processed. The independent samples t-test is used for the comparison of mean values between two samples. Two-way ANOVA test is applied to understand vessels allocation to the berths with the effect of time and the berths. Also the variables are analysed with correlation. The statistical test results show that vessel size has an increase and the berths of port is forced to meet the vessel needs . In addition, it is revealed that vessel size is in a relationship with the amount of handled containers and this relationship is getting stronger year by year for the port. As a result, statistical report supports that the port needs deeper berths and new technological investments.

Keywords: *Data Science, Statistical analyse, Container port*

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Evaluation of the Effect of Platelet Rich Plasma (PRP) in Semen Samples Prepared by Simple Washing Method

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Abstract

Sperm motility is an important parameter in male infertility and it is important to obtain motile sperm in reproductive aids. Many studies have shown that simple washing is a factor when sperm count is intended to be high. Platelet Rich Plasma (PRP) is a high concentration of platelet-containing plasma derived from blood and is currently used in many research and clinical treatments. Our goal is to look at the effect of some semen parameters (motility, number) by performing two simple washes with PRP in semen samples. PRP is intended to be an additional alternative to the media used in simple washing, one of the sperm preparation techniques. 10 cc blood samples were used for each of the 10 volunteers, whose permission was obtained with informed written consent forms, to obtain PRP. 20 non-azoospermic patients who were informed by voluntary consent forms and came to the spermiogram were included in the study. After the semen samples were evaluated by spermiogram; It was divided into two groups as control and experiment groups. The control group was washed twice with the simple washing method routine with PBS. In the experimental group, semen samples were washed twice with PRP. Comparisons were made by evaluating the motility and counts of both groups after the 15th minute, 30th minute, 45th minute and the 2nd centrifuge and evaluated statistically. It was observed that PRP was more effective in +4, +3 and +2 motility in the first 15 minutes. It has been shown that there is a decrease in the motility of sperm by losing its effect in our other working times, 30 and 45 minutes. After the second centrifuge 45 minutes, a second washing was performed with PRP. In the measurements made after this washing, there was a significant increase, although not until the first 15 minutes. PRP has a significant effect on sperm motility; PRP can be an alternative washing material in sperm preparation for low sperm motility intrauterine insemination (IUI) and intracytoplasmic sperm injection (ICSI).

Keywords: Sperm motility, Sperm washing, Platelet rich plasma

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Detection of Wrong Way Drivers

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Abstract

It is observed that there are so many wrong way drivers in the traffic. Violation of this rule causes fatal accidents to occur. In this research, a study was carried out to detect the vehicles trying to move in the wrong direction in traffic by video processing. Firstly, the vehicle was detected instantly, and then it was decided whether the spot that was detected is moving in the right or wrong direction according to the position change. In the first part of the study, motion status change is provided by distinguishing various tools with image processing. In the second stage, it is aimed to cut out the video / image sections which are having the rule violation. The extracted images are stored in a specific folder, and could be reported with the time of violation and the image of the violators. In this study, OpenCV library was used while determining the Region of Interest (ROI) and the location change of the specified region. This choice was made because it is an open source library and many ready codes are offered for free. The study has been successful at a basic level, but in cases where the angle of the camera changes, the parameters used must be updated manually. This problem prevents the study from being useful. As a future study, improvements will be made to overcome this problem.

Keywords: *Image processing, Object tracking, Smart cities, Video processing*

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Molecular Dynamics and binding studies for Piperazine and Morpholine Substituted Quinolines with GAK

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Abstract

In present study, piperazine/morpholine substituted quinoline derivatives at C-3, C-6 and C-8 starting with 3,6,8-tribromoquinoline were prepared under microwave or conventional heating reaction conditions by SNAr. Then, we evaluated the possible interactions between piperazine/morpholine substituted quinolines and its receptor, Cyclin G associated kinase (GAK), with molecular dynamics and docking studies in order to lead the design of recently prepared quinolines derivatives, which could bind to GAK more effectively and perform enhanced antiviral effect against HCV. The total binding enthalpy energies have been obtained by MM-PBSA thermodynamic computations has been shown that compounds 6,8-dimorpholinyl-3-bromoquinoline and 6,8-dipiperazinyl-3-bromoquinoline have the greatest potentials towards inhibition of GAK by MD computations. The last 12 ns of molecular dynamics trajectory have shown the strong interaction of them with the inner surface chains of GAK. These compounds can be recommended to be further investigated for HCV therapy.

Keywords: *Quinoline, Cyclin G associated kinase, Hepatitis C virus, Molecular dynamics, MM-PBSA*

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A preliminary study on Mobile Monitoring System for Intervention and Tracking after Traffic Accidents

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Abstract

Traffic accidents are one of the most common causes of casualties worldwide. Many people are injured or lose their lives at any time due to traffic accidents. Since most of the accidents occur on intercity roads, the time to get noticed and help can be extended. With the prototype system designed, it is aimed to intervene the victims as soon as possible after the traffic accidents and to ensure that the people are affected from the negativities to a minimum. Thanks to the sensors and position sensors on the vehicle, information about the vehicle's location and accident status is transferred to the 112 service via the GSM line. In this process, SpO2 and pulse information can be tracked instantly by 112 service through wearable technology on the person driving the vehicle.

Keywords: *Traffic accident, Pulse, GPS, GSM, SpO2*

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Modeling Solar Radiation through Stochastic Markov Chain

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Abstract

Due to the data quality, missing data issues, and time limitations when modeling solar radiation, the design of reliable modelling methods is needed. This study presents a Markov chain model to determine or forecast for future solar radiation. In other words, the goal of this model is to build a simple and concise model in terms of statistical thresholds for stochastic solar generators. The main statistical parameters, such as quartiles and means, are the thresholds used to classify the state of each data sample. Moreover, the accuracy of our method is evaluated with data from 1990 to 2018 that has been recorded by three Algerian meteorological stations (Tamanrasset, Ghardaïa, and Oran) which represent respectively coastal, central and oasis sites. To validate the performance of our model, several statistical tests were performed. The results show a good performance of this study's proposed method by using specific thresholds obtained by box-plots of historical data. Additionally, this method allows for the long-term conservation of the experimental data's statistical properties compared to the existing methods. Hence, we believe our proposal can help develop a new approach for optimizing energy production from solar energy sources and photovoltaic systems.

Keywords: *Solar radiation, Markov chains, Stochastic modeling, Statistical thresholds*

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Modeling of The Risk of Introduction of Non-Native Species To The Port of Arzew by Biofouling on The Ships Hull, Between 2013 and 2016

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Abstract

Biological invasions are a major cause of species extinction and biotic homogenization worldwide (Sala et al. 2000; Lockwood and McKinney 2001). Biofouling of ship hulls is considered as one of the oldest vectors for the transfer of aquatic invasive species. However, much research has been conducted on the introduction of non-native species through ballast water at the expense of biofouling. In this study, an alternative approach that deals with biofouling was proposed based on the work of Bouda, 2017 in the port of Arzew. It consists of a calculation of the surface area of biofouling of all ships calling at the port of Arzew during the period (2013-2016) to which is added spatial modeling using a GIS to highlight the most relevant information. The wetted surface of the ships indicates the importance of the propagule pressure that corresponds to the successful introduction effort of a species, as it is this submerged surface of the ship that hosts the organisms and spreads them around the world. Each calculated biofouling surface is associated with its bio-region as defined by the IUCN (International Union for Conservation of Nature), as well as other parameters such as the number of ships, their shipping routes and the environmental similarity of the seawater in the port of Arzew and other bio-regions. We identify the areas that represent a high risk of species introduction, according to their respective ecoregions of origin, those that constitute a minor risk, the type of ship that best promotes the establishment of non-native species by comparing the environmental similarity of the ecoregions assigned to the different ships with the environmental characteristics of the port of Arzew obtained by satellite imagery. The study showed that over a period of 4 years, 5733 ships called at the port of Arzew, accumulating a total surface area of Thirty-five million square meters. It is worth mentioning that an eco-biological study will be published shortly in order to empirically demonstrate the relationship between maritime traffic and the success of the invasion in marine waters.

Keywords: *Modeling, Hull biofouling, Ecoregion, Marine traffic, Introduced species*

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Anomaly Detection Based k-Nearest Neighbour Algorithm in Energy Optimization of High Storage Systems

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Abstract

The concept of industry 4.0, which aims to increase productivity in businesses and reveal advanced production systems, has ensured that various technologies known to contribute to the product life process are gathered under one roof and integrated into a common structure. Ascending systems such as big data, internet of things and cyber physical systems, have initialized the digitalization in production and have paved the way for smart factories. The production systems digitized by ensuring healthy data flow between the units and the intelligent factory structures that are automated in line with this digitization process find more and more places in the production industry. Although such systems have provided important developments and technological advances in production processes, they also bring with it various problems. One of these is the process of quickly detecting and resolving an abnormal situation occurring in autonomous production systems. In this context, various studies have been carried out recently for anomaly detection. One of the most studied areas for anomaly detection is machine learning algorithms. The anomaly detection system is based on the teaching of a large number of anomalies that can be encountered in a learning model that will be created by a classification algorithm. In this way, it is aimed to detect any faults that will cause great losses in the in-plant processes working with full performance, and to carry out the necessary solution processes quickly. In this study, measurements were made on the anomaly detection of the learning model created with k-Nearest Neighbor algorithm on a open source data set obtained from a prototype study applied on energy optimization of high storage systems from smart factory structures. On this data set, measurements of anomaly detection of the learning model created with k-Nearest Neighbor algorithm were made and the situation of whether it could be used for this purpose was investigated. As a result, the learning model achieved a high level of success by obtaining the correct positive prediction level at 96%. The data obtained shows that the k-Nearest Neighbor algorithm is successful in anomaly detection systems.

Keywords: *Anomaly detection, Classification, Machine learning, Smart factories*

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The Impact of Web Search Engines on the Text Mining

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Abstract

The development of technology has brought both positive and negative results. Besides the positive effects such as facilitating access to information and saving time, it also has negative effects such as the difficulty of extracting meaningful information from the data observed. Because, the documents suggested by web search engines are generally using the search keywords and they don't check the content of these documents which are related or not. Within this study, in order to create automatic language dictionary about a topic using well-known different web search engines were experimented in terms of their suggested documents relationality. For this purpose, an automatic dictionary creating model using web documents were developed. In this model, the topic seed words are determined by the documents presented to the system initially. TF-IDF metric was used as meaningful word detection method. Then, these meaningful words were sorted according to TF-IDF meaning values and the top n meaningful words were added to the dictionary. The value of n was determined experimentally. When searching the web with the words added to the dictionary, new documents were suggested by the web search engines. By repeating the process, experimental dictionaries of a certain size were obtained. By the way, the documents suggested by each web engine are generally different, so that the dictionary similarity produced from the top suggested documents can measure web engines performance of selecting relational documents. Hash similarity was used to evaluate dictionary performance. According to the results, dictionary with the 73.9% highest similarity for Google search engine, dictionary with the 68.7% highest similarity for Bing search engine and dictionary with the 60.5% highest similarity for Yandex search engine were produced.

Keywords: *Automatic Dictionary Creation Hash Similarity Natural Language Processing Performance of Web Search Engines TF-IDF Metric*

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Real-Time Processing of IoT Data

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Abstract

Today, the increase in the use of IoT (Internet of Things) devices has led to the formation of high density and different kinds of data. The formats, shapes and densities of this data collected from IoT devices are completely different. This data needs to be processed instantaneously and transmitted instantly to the user concerned. In this article, a model is designed to process data obtained from IoT devices and transmit them to the end user instantly. In this study, non-structural data collected from IoT devices were subjected to data preprocessing steps. Significant words were determined from the data obtained after the data pre-processing steps. For this purpose, TF-IDF metrics were applied. After meaningful word detection, the subject of each meaningful word was redirected to the Rabbit MQ distributed message processing queue to process the data instantly. This ensures that messages are delivered. Apache Storm topology is used to receive and process the messages transmitted to the Rabbit MQ queue instantly. Using the guaranteed message processing infrastructure, the Apache Storm topology will read the messages through Rabbit MQ distributed queuing technology and store the printouts in Elasticsearch after performing the necessary operations and calculations. The results generated in the Apache Storm topology will then be shared with the end user using the REST API architecture.

Keywords: *Internet of Things, Big Data, Rabbit MQ, TF-IDF Metrics, Apache Storm, Elasticsearch*

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A Novel Variable Selection Approach in Microbiota 16S rRNA Data Analysis

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Abstract

Microorganisms associated with human skin, nasopharyngeal and oral cavities, vaginal tract, and gastrointestinal system make up the human microbiota. Recent advances in DNA sequencing technology have facilitated profiling of these microbial communities through high throughput sequencing of amplicons of the marker genes such as 16S rRNA for bacteria, 18S rRNA or ITS for eukaryotic microbes or otherwise shotgun metagenomics. Species abundance tables are zero inflated and show high dimensional data as hundreds of species per sample can be profiled. Nonetheless, the high dimensional data in such tables must be treated with dimension reduction techniques to draw sensible conclusions from the data. The aim in this study is to propose a novel approach to reduce dimensions in high dimensional and inherently zero inflated and frequency character microbiota data. Many approaches in handling such datasets have been proposed in the literature in terms of reducing dimensions but rarely in combinations of multiple methods. Here, we propose a combinatorial use of some statistical methods in reducing data dimensions. These methods include a univariate tests depending on the data type, zero inflated negative binomial model, regression trees, and variable selection algorithm. Using these four methods enabled us to select most important features of the microbiota dataset for the subsequent downstream analyses. We tested the above approach on our recent microbiota dataset we generated from stool samples of Parkinson's disease patients cohort. Of 199 bacteria genera our approach enabled us to select 19 candidate biomarker genera, which are often implicated in serving critical metabolic activities in human body such as production of short-chain fatty acids. To assess the potential of these candidate biomarkers in differentiating disease and healthy states we developed a multiple logistic regression model and further selected their biomarker potential in a stepwise variable screening. Here we successfully demonstrated that hitherto untested combinatorial use of feature selection methods enables more useful predictive models. This approach can potentially be applied on high dimensional datasets other than microbiota 16S rRNA data.

Keywords: *Zero-Inflated models, Frequency data, Classification and regression tree, Variable Selection algorithm, Microbiota, Parkinson's disease*

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Classification of Tweets About Disasters with BERT Model

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Abstract

With the development of technology and the widespread use of the internet, people have the opportunity to spend most of their times on the internet via mobile devices they can carry with them. One of the most popular environments on the Internet is social networks. According to the 2020 global digital report, the number of people with internet access is almost 4.5 billion and the number of social network users is around 3.8 billion. Through their mobile devices, people share their instant information and personal experiences on social networks. Twitter, which is one of the most widely used social networks, allows its users to share messages called "tweet" consisting of 280 characters. At the end of 2019, Twitter has 152 million daily active users and more than 80% of users access Twitter via mobile devices. Twitter is a medium where people can make sharings about any usual or unusual situations that they experience instantly. It is one of the popular platforms for sharing disaster situations such as earthquakes, accidents, storms, and various natural events. It is a valuable information source for emergency teams and traditional media companies. It is extremely difficult to manually analyze these Twitter posts. Artificial intelligence supported software is frequently used for this job. Natural language processing, which is a sub-branch of artificial intelligence, involves studies on computer interpretation of the languages people speak. Computers think mathematically, not with concepts like people. For this reason, a mathematical model of the language must be created in order to process natural language data. For reasons such as language arts used in natural language and differences of expression originating from people, the words used can be interpreted as meaning different from their real meaning. This situation causes difficulties in understanding natural languages. It is important to teach these exceptional cases to computers for the natural language processing process to work properly. In this study, a data set consisting of shares about unusual situations such as earthquakes, floods, accidents, and natural events on Twitter was classified as real or unreal. In the classification process, BERT model developed by Google was used to eliminate the bottleneck caused by one-way and context-free approaches of traditional natural language processing methods. The BERT model provides more successful results by revealing the contextual relationships between words and sentences in the document. As a result of the classification of tweets in the data set with this model, 98% accuracy was achieved.

Keywords: *Twitter data analysis, Machine learning, Natural language processing*

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Vehicle Detection On Aerial Imagery As Small Object Detection Difficulty

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Abstract

Vehicle detection on aerial images is important for many areas such as traffic management, design of smart transportation systems, disaster management, parking lot management, city planning and especially for intelligence, military reconnaissance and surveillance. However, despite developing satellite and electro-optical systems; it is difficult due to low spatial resolution, complex background, light / shadow differences on the object and objects being camouflaged by the environment. Recently developed CNN-based networks are promising. These networks have been successful in datasets containing large-scale objects. However, they are not sufficient for the detection of small objects and need fine tuning for this task. In this study, with the VEDAI dataset, faster RCNN algorithm and proven ResNet network in detecting of relatively large objects are investigated. Various experiments have been carried out with changes in the faster RCNN algorithm and the ResNet network for performance enhancement on images where objects occupy as little as 0.5×10^{-3} of pixels in the total image. As a result of the experiments, it has been shown that it is possible to achieve an average sensitivity of 74.9%.

Keywords: Object Detection, Deep Learning, Aerial Images

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Hybrid Meta-Heuristic Algorithm for Solving Bin Packing Problem 3D

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Abstract

Throughout this study, Hybrid Meta-Heuristic algorithms developed for solving the Bin Packing Problem (BPP) 3D. The algorithms are a combination of the Crow Search Algorithm and the Genetic algorithm. It is the first time that the Bin packing problem 3D type is solved using the Crow algorithm and the hybrid Crow-Genetic algorithms. The characteristics of the problem are offline BPP 3D, cuboid-shaped items, fixed in width and length, and free height one container, the items are rotatable by 90 degrees. Since there exists no benchmark dataset for the problem, a random dataset was generated. Herein Crow algorithm, Genetic algorithm, Hybrid Crow-Genetic algorithm, Hybrid Genetic-Crow algorithm were designed and tested. The results show that the Hybrid Crow-Genetic algorithm performed better than others.

Keywords: *Supply Chain, Bin Packing Problem (BPP) 3D, Combinatorial Optimization, Hybrid Meta-Heuristic, Crow Search algorithm, Genetic Algorithm*

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Machine Learning with Software Test Effort

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Abstract

One of the main headlines of software test literature is the problem of not having a sound estimation of software test effort while scheduling a plan for the whole software development. In this work, using Machine Learning algorithms, we propose a new method of software effort estimation. Using the past experiences of software test efforts in the areas of command center graphical unit interfaces, embedded and real-time software test developments, we strive for better estimations. The new estimations are evaluated in comparison with the traditional methods.

Keywords: *Software Test Effort Estimation, Artificial Neural Networks, Source Optimization, Machine Learning, SVM*

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Effect of Dimension Reduction on The Performance of Fuzzy Clustering Methods

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Abstract

Fuzzy clustering methods are common clustering approaches used in different fields in the literature. Dimension reduction is a technique that transforms large datasets into smaller dimensions data sets with the least amount of information loss possible. In this study, the performance of fuzzy clustering methods on datasets with reduced dimensions is evaluated. For this purpose, Fuzzy C-Means (FCM), Type-2 Fuzzy C-Means (FCM2), Possibilistic Fuzzy C-Means (PFCM) and Unsupervised Possibilistic Fuzzy C-Means (UPFC) clustering approaches are used. In reducing the dimension of the data sets, a series of components that explain the variance in the data with a minimum of 80% are chosen by using Truncated Singular Value Decomposition (TSVD) method. In the study, the original and reduced datasets are clustered separately with the mentioned clustering methods, and clustering performance is measured by the Silhouette Index (SI), Partition Coefficient (PC), Partition Entropy (PE) and Root Mean Square Error (RMSE). The clustering success of the methods on original and reduced datasets is presented comparatively. According to the results obtained, the performance of the methods is better on the reduced datasets than the original datasets. When the contribution of dimension reduction to clustering success is evaluated; it seems that this contribution was achieved the most for FCM and the least for FCM2.

Keywords: *Clustering, FuzzyC-means, TSVD, Dimension reduction*

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An Application of Risk Evaluation for Herniated Disc

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Abstract

The purpose of this study is to create an application which helps people to evaluate the risk that whether they have herniated disc or not. With a few feature inputs from the screen, users can evaluate the risk themselves whether they are sick or not. Purpose of this study is to prevent loss of efficiency in health sources in healthy cases and direct the patient to hospital early to prevent the sickness to become much worse.

Keywords: *Herniated Disc, Risk Evaluation, Machine Learning*

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Malware Detection in Android OS

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Abstract

In this paper, supervised machine learning techniques (SMLTs): Random Forest (RF), support vector machine (SVM), Naïve Bayes (NB) and decision tree (ID3) are applied in the detection of malware on Android OS and their performances have been compared. These techniques rely on Java APIs as well as the permissions required by employment as features to generalize their behavior and differentiate whether it is benign or malicious. The experimentation of results proves that RF has the highest performance with an accuracy rate of 96.2%.

Keywords: *Machine learning techniques, Android OS, Malware Detection*

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Stock Market Forecasting Using Deep Learning Method

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Abstract

The stock market can be considered as an indicator of a country's economic conditions. The stock market is a neutral area for brokers and companies to invest. Due to the high return on investment, people tend to invest in exchanges rather than traditional banks. However, due to high fluctuations in the exchange rates, the risk of investing in exchanges is high. Therefore, developing a fairly robust stock forecast system can help investors make a better decision about investment. In this study, Long Short-Term Memory (LSTM) model, which is a deep learning-based approach, is applied to stock historical data to estimate future market value. We used the data set consisting of stocks of five well-known Turkish companies in the stock exchange. As a result of the RMSE, MSE accuracy tests performed using these data, it has been seen that stock market estimation can be made successfully with LSTM.

Keywords: *Stock market prediction, machine learning, LSTM, deep learning*

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Edge, Fog and Cloud Computing: Offering Strong Computing

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Abstract

Advances in the Internet of Things (IoT) and 5G technology require new strategies and technologies to process any data from these areas. With edge, fog and cloud computing technologies, it will be possible to collect data from devices that use a wide variety of protocols and produce data in many different formats and process these data in real time. This article, by examining the difficulties in the advancement of computing types and their application areas, the requirements and solutions are presented to provide strong computing.

Keywords: *Edge computing, Fog computing, Cloud computing, Data analysis*

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Granulometric Indices Cartography for Beach Characterization: Influence of Coastline Changes and Hydrodynamic Factors

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Abstract

The objective of this article is the spatiotemporal monitoring of coastline and beaches in relation to hydrodynamics and sediment dynamics. Since the study area is local, it is important to carry out a very high spatial resolution study. To achieve our goal we used satellite images with a spatial resolution of 0.2 m on the one hand and the high-resolution SWAN model on the other hand. We have transformed satellite images into coastlines. For the diachronic study we used ArcGIS to create a mosaic of images, to rectify these mosaics and to calculate the distances separating the coastlines taken on different dates. We observed the presence of erosion/accretion on several beaches. This evolution can be explained by the effect of the maritime structures and the contributions of the wadis. Wave energies are distributed unevenly along the coast due to the bathymetry of the area and the orientation of the coastline. The study of the sedimentary dynamics based on the granulometric study of the surface sediments and the extrapolation of the different granulometric indices under ArcGIS allowed us to show the distribution of different sedimentary facies on the surfaces of the studied beaches. We noticed a concordance between the distribution of wave energies and the evolution of the coastline. On the other hand, the combination of the results obtained and the granulometric analysis allowed us to explain the distribution of sedimentary classes.

Keywords: *Coastline, Beaches, GIS, Hydrodynamics, Granulometry*

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The Impact of Data Mining and SaaS-Cloud Computing

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Abstract

Cloud Computing has emerged as a powerful paradigm that has successfully dominated network services in many application areas and significantly transformed the IT industry. In the Cloud Computing, all resources are available as services and accessible via the Internet. Software as a Service is considered as the king of service delivery models that enable end-users to access to any software or application as a service via the Internet, without local installation. Over the past decade, this model has been widely adopted by many organizations and individuals, leading to the production and accumulation of a huge amount of data stored in the Cloud from distributed nodes that must be recovered very efficiently. Software as a Service providers must be able to manage this data successfully, evaluate and improve the quality of their solutions in order to provide reliable and efficient services to users of Cloud services. On the other hand, Data Mining is a current trend in the field of data treatment that allows the extraction of useful and meaningful information from raw data. The integration of Data Mining techniques into Cloud Computing–Software as a Service -has become commonplace and can support the adequate provision of services by providing agility and rapid access to technology. This article introduces the basic concepts of Data Mining and Cloud Computing first and discusses the coupling of the two paradigms. Then, it describes how Data Mining can be used and integrated to improve Software as a Service services in the Cloud. Finally, it reviews relevant and important research in this area.

Keywords: *Cloud Computing, Data Mining, KDD, Software as aService, Data Mining in Cloud Computing, Classification, Clustering*

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Contentment Analysis of Telecom Customers in Turkey

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Abstract

For companies, customer contentment is important to maintain customer continuity. In order to ensure this continuity, companies offer their customers many campaigns and offers. However, doing this by analyzing the contentment of its customers can prevent customer loss, so customer contentment analysis is vital for companies. In this study, we focus on the contentment analysis of telecom customers in Turkey by presenting the potential customer loss and measuring the satisfaction situation of customers through sentiment classification. Customer opinions released from Twitter are gathered about Turkcell, Turk Telekom, and Vodafone which are three big telecommunication operators in Turkey. To implement the sentiment classification task, various machine learning models such as random forest, support vector machine, multilayer perceptron, k-nearest neighbors, naive Bayes, and decision tree are implemented. The fact that the experiment results are over 80% accuracy results reveals that customer contentment analysis should also be evaluated in social media platforms such as Twitter.

Keywords: *Sentiment classification, Customer contentment, Machine learning techniques, Telecom operators*

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Red Point Detection with 6 Axis Robot Arm

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Abstract

This study's general purpose is to determine the coordinates of the red point on the surface by using real-time image processing techniques through the camera and user interface fixed on the 6-axis robot arm. The movement of the robot arm is done in the ABB RobotStudio simulation environment. In the red point detection process, a 2D webcam camera is used. The red point's detection is done by the interface developed in MATLAB, depending on three axes. The interface detects the right location of the red point using the robot's current location and the image it receives from the camera. This determination is done utilizing the mathematical formula prepared according to the location of the camera. With this developed software system, X, Y, and Z coordinates of the red point can be found on flat surfaces of all shapes. This study is planned to prepare an environment for red point detection based on six axes.

Keywords: *Image Processing, Robot Arm, Red Point Detection*

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Veri Madenciliği Teknikleri Kullanılarak BIST 100 Borsa Endeksi Hareketinin Sınıflandırılması

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Özet

Finansal piyasalarda, gelecekteki hisse senedi endeksi fiyat hareketini tahmin etmek, yatırımcıların riskini azaltmak ve dolayısıyla karını maksimize etmek için etkili stratejiler benimsemelerinde her zaman önemli bir konu olmuştur. Öte yandan, gelecekteki hisse senedi fiyat hareketini geleneksel tahmin yaklaşımları ile tahmin etmek, zaman serisi verilerinin karmaşık yapılandırılmış davranışları nedeniyle genellikle zor bir işdir. Birçok önemli çalışmada, veri madenciliği tekniklerinin borsa fiyat hareketinin tahmininde oldukça tatmin edici sonuçlar ürettiği gösterilmiştir. Tahmin problemi, bir artan hareket diğeri ise azalan hareket için olan bir ikili sınıflandırma problemi olarak kabul edildiğinde, bu çalışma, farklı makroekonomik göstergelere dayanarak (petrol fiyatı, altın fiyatı, döviz kuru, faiz oranı, para arzı, TÜFE, cari açık, ödemeler dengesi ve sanayi üretim endeksi) BIST 100 Endeksi getirisinin günlük yönünü tahmin etmede kapsamlı bir veri madenciliği uygulaması sunmaktadır. Çalışmada kullanılan sınıflandırıcılar arasında lojistik regresyon, k-en yakın komşu, farklı çekirdek fonksiyonlarına sahip destek vektör makineleri, karar ağacı ve Naive Bayes algoritmaları bulunmaktadır. Sınıflandırma modellerinin etkinliğini değerlendirmek için çeşitli performans ölçütleri kullanılmıştır.

Anahtar Kelimeler: BIST 100, Sınıflandırma, Veri Madenciliği

Classification of BIST 100 Stock Index Movement Using Data Mining Techniques

Abstract

In financial markets, predicting the future stock index price movement has always been an important topic for the investors to take effective strategies in terms of minimizing their risk and hence maximizing their profit. On the other hand, predicting the future stock price movement with traditional forecast approaches usually a difficult task due to the complex-structured behavior of the stock market time series data. In many important studies, it was shown that data mining techniques generate satisfactory forecasting accuracy of stock market price movement. When the prediction problem is considered as a binary classification problem which one for the increasing movement and the other for decreasing movement, this study presents a comprehensive data mining applications to forecast the daily direction of the BIST 100 Index return based on different macroeconomic indicators (such as oil price, gold price, exchange rate, interest rate, money supply, CPI, current account deficit, balance of payments, and industrial production index). The classifiers used in this study include logistic regression, k-nearest neighbor, support vector machine with different kernel functions, decision tree and Naive Bayes. To evaluate the efficiency of the classification models, various performance measures are used.

Keywords: BIST 100, Classification, Data mining

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Effect of A β on the Probability of Molecule Reception in MCvD

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Abstract

Recently, too much effort has been conducted toward development of novel communication techniques for implementing in nano-scale systems inspired from electro-chemical (biological) communication systems that naturally used by living beings. One of these techniques is known as Molecular Communication (MC) in which chemical signals are used as carriers for transmission of information through fluid media. The information carrier particles used in such communication systems consist of biological components such as DNA and protein components. In this study, software based MC model that can possibly be used in nano-scale systems are analyzed in terms of channel performance of communication such as Amyloid- β peptide (A β) particles that is distributed randomly into the environment. The proposed model is analysed for different value of A β particles to increase the probability of molecule reception of the receiver for the proposed MC model using the point transmitter and spherical receiver. It is observed that the signal transmission ratio increased with the use of a lower amount of A β . This study has also a potential to compensate for the negative effect of Amyloid Beta (A β 40-42) peptides by which Alzheimer disease could arise in the biological neuronal network.

Keywords: *Amyloid- β Peptide, Viscosity, Molecular Communication*

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Bulanık İki Yönlü Varyans Analizi ve Bir Uygulama

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Özet

İki yönlü varyans analizi diğer adıyla tesadüf bloklar deneme planı, deneme materyalinin tek yönde heterojenlik gösterdiği durumlarda uygulanması gereken bir deneme planıdır. Bir deneme için yeterli sayıda homojen materyalin bulunmadığı durumlarda bu homojenliği bozan faktörler bloklara ayrılarak kendi içerisinde homojen olan blokların oluşturulmasını sağlamaktadır. Böylece muameleler arası farklılıktan ve materyalin homojen olmamasından ileri gelen belirsizliklere dayalı hataların azaltılması sağlanmaktadır. Bloklar arasındaki belirsizliklerden kaynaklanan farklılığı ölçen bulanık kareler toplamının hesaplanması deneme hatasına düşen, hata miktarını küçültmektedir. Çalışmanın amacı, bulanık tesadüf bloklar deneme planının teorik temelleri açıklanarak ilgili istatistik değerlerin hesaplanması ve yorumlanması aşamalarının örnek bir veri kümesi üzerinde sistematik olarak gösterimleri amaçlanmıştır.

Anahtar Kelimeler: Deneme Planı, Blok, Bulanık İki yönlü Varyans Analizi

Fuzzy Two-Way ANOVA and An Application

Abstract

Two-way analysis of variance, also called random blocks trial plan, is a trial plan that should be applied in cases where the trial material shows heterogeneity in one direction. In cases where a sufficient number of homogeneous materials are not available for an experiment, the factors that disrupt this homogeneity are divided into blocks, thus creating blocks that are homogeneous in themselves. Thus, it is ensured that the errors based on uncertainties caused by the difference between the treatments and the material not being homogeneous are reduced. The calculation of the sum of fuzzy squares measuring the difference caused by uncertainties between the blocks reduces the amount of error that falls on the trial error. In this study, it is aimed to explain the theoretical bases of the fuzzy coincidence blocks trial plan, and to display the necessary statistical values on a sample dataset systematically.

Keywords: Trial Plan, Bloc, Fuzzy One-Way ANOVA

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Predicting Fuel Consumption by Machine Learning with Reverse Engineering on Can-Bus Data

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Abstract

With the development of automobile technology, it becomes possible to estimate fuel consumption by using the vehicle sensor data from the controller area network (CAN) bus. Thanks to its CAN bus structure, it is possible to reach detailed data from sensors inside the vehicle such as O2 sensor voltage, fuel pressure, Catalyst temperature etc. This study aims to predict the instantaneous fuel consumption from collecting a large-scale vehicle CAN bus data and making it meaningful with reverse engineering. In this way we aim to better understand how the multiple variables influence the instantaneous fuel consumption. With this predictive model, it is better understood how the variables obtained from the sensors affect the instantaneous fuel consumption and it is proposed to reduce the fuel consumption between 1% and 2% by interfering with the intake air temperature information. This approach and the experiments can also support original equipment manufacturers in developing and marketing this technology in the future. In this way, we can have a cleaner environment and less carbon emissions.

Keywords: *CAN buss, Machine Learning, Reverse Engineering, Predict Fuel Consumption*

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COVID-19 Salgınında Birliktelik Yöntemleri ile Vaka Profiline Belirlenmesi

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Özet

2019 Aralık ayında ilk Çin'in Hubei Eyaleti Wuhan'da görülen ve sonrasında tüm dünyaya hızla yayılan ve ciddi akut solunum sendromuna sebep olan 2019 koronavirüs salgını (COVID-19), SARS ve MERS salgınları sonrası görülen üçüncü koronavirüs salgını olarak tüm dünyayı etkisi altına almıştır. 04.04.2020 itibari ile, 61.141 ölüm, 236.158 iyileşen hastanın olduğu toplamda 1.138.598 vaka gözlenmiştir. Bu sayı halen artmaktadır. Salgın dünya çapında 205 ülkeye yayılmıştır ve dünya çapında halk sağlığı için büyük bir tehdit olmaya devam etmektedir (Liu vd. 2020). Bu çalışmada COVID-19 vürüsüne yakalanmış hastaların veriseti üzerinde bir uygulama gerçekleştirilecektir. Çalışmada veri madenciliği yöntemlerinden birliktelik kuralları yöntemleri bu virüsün gözlemlendiği hastaların eldeki verileri üzerinden R programlama dili kullanılarak uygulanacaktır. Böylelikle, hastalığın seyretteği kişilerde var olan anlamlı birlikteliklerin ortaya konması amaçlanmaktadır.

Anahtar Kelimeler: *Veri Madenciliği, Birliktelik Analizi, Apriori, FP-Growth COVID-19*

Determining the Case Profile in the COVID-19 Outbreak by Association Methods

Abstract

The 2019 coronavirus outbreak (COVID-19), first seen in Wuhan, Hubei Province of China in December 2019, and then spreading all over the world, caused the third+ coronavirus outbreak after SARS and MERS outbreaks. By the date, 04.04.2020, a total of 1.138.598 cases were observed with 61.141 deaths and 236.158 healed patients. This number is still increasing. The epidemic has spread to 205 countries worldwide.

In this study, an application on dataset of patients with COVID-19 virus will be performed. In the study, coexistence rules methods, which are among the data mining methods, will be applied using the R programming language on the available data of patients who have this virus. Thus, it is aimed to reveal significant associations that exist in people with the disease.

Keywords: *Data Mining, Association Analysis, Apriori, FP-Growth, COVID-19*

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