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PREFACE

International Conference on Interdisciplinary Applications of Artificial Intelligence 2021 (ICIDAAI'21) was organized online from 21-23 May 2021. This was the first virtual conference which was organized in collaboration with Yalova University, Istanbul University, Kocaeli University, Sakarya University, Bursa Techical University, UET Lahore University, Matej Bel University, University of Tlemcen, Universite 8 Mai 1945 Guelma, International Vision University, Bulgarian Academy of Sciences, Lahore Leads University and IQRA National University.

There were 106 presentations for the virtual conference. A secured platform was used for virtual interactions of the participants. After the virtual conference, there was a call for full papers to be considered for publication in the conference proceedings. Manuscripts were received and they were processed and peer reviewed. These manuscripts cover a range of Artificial Intelligence topics from social sciences to physical sciences.

We hope that these chapters will add to literature, and they will be useful references. To conclude, ICIDAAI'21 was a successful event, and we would like to thank all those who have contributed. We would also like to thank the Organizing and International Advisory committee members, the participants, and the reviewers.

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CONTENTS

Performance Comparison of Machine Learning Methods in Hotel Reservation Cancellation Estimation

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Abstract

Commercial establishments must keep their profit rates high in order to continue their activities. This also applies to hotels that have an important place in the service industry. Although hotels that want to keep their limited number of rooms at the highest occupancy rate try to maximize their profits using strategies such as capacity increase and pricing, they cannot achieve the desired profit due to their customers canceling their reservations for various reasons. Overbooking method is applied to prevent this but in that case problems such as lack of expert staff and long-term customer dissatisfaction are encountered. In this context, prediction of reservation cancellations in advance will increase the success of the overbooking or similar profit saving activities while making the planning easier.

In this study, an attempt is made to estimate reservation cancellation by using various classification methods on an open shared data set that contains the reservation information of the hotels in resort and city type between 2015 and 2017. In the first step of the study, a feature investigation is made and the features containing null values that will not be useful in the classification process are removed from the dataset. Then, a dimension reduction method is applied to the dataset. In the second part, k-Nearest Neighbors algorithm, Logistic Regression, Artificial Neural Networks, Decision Tree algorithm, Random Forest algorithm and Gradient Boosting methods are carried out on the data in question and performance values are obtained for each of them. In the third part, performance values are compared. According to the results of this comparison, the best classification methods were the k-Nearest Neighbor algorithm and Random Forest algorithms with both 85% accuracy value.

Keywords: *Hotel reservation cancellation, Machine learning, Supervised learning*

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Integrating AI and Machine Translation in Translation Education

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Abstract

AI, in the form of machine translation engines and ideas, has been a subject of interest within translation studies. From the infamous IBM report and very early examples whose ill reputation still lingers on the general public to the cutting edge technologies which harness the power of neural networks and fuzzy logic, AI blended itself in the phenomenon of translation. Developing and steering the innovative technologies is one thing, yet, teaching them within the actual translation classroom is another struggle. This paper aims to scrutinize the possible inclusion of AI and machine translation systems to translation curriculum. After giving a general outline of the idea of AI within the translation studies, we aim to discover probable applications to form a basis for more forward-thinking translators so they can both understand and contribute to the development of AI within the field of translation. Key topics will include project management systems, machine translation, content production and post-editing process.

Keywords: *Machine translation, Translation education, Translation technologies*

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Old Age and Access to Digital Services in the Technology Community

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Abstract

With the expansion of technology, many of the services related to everyday life practices have started to be realized in a digital environment. The technological services in question become even more important in quarantine processes that occur in extraordinary situations, such as the Covid-19 pandemic process. Digitization of services provided in many areas, especially public institutions, saves time for people who need these services, while the process leads to negative consequences for those who do not have technological access and digital citizenship skills. It is not possible for people over a certain age to adapt to the process and make enough use of digital services, especially if they are introduced to technology late. The aim of this study is to identify the barriers to digital inclusion processes of the elderly and the negatives created by these barriers, to identify the disinterested situations created by being old in the technology society. For this purpose, data will be collected using the semi-structured interview technique with individuals over the age of 65. This study, which will be qualitative research, aims to identify the obstacles faced by older people in the process of digital inclusion and the disadvantages of adapting to the technology society by performing a descriptive analysis of the data obtained.

Keywords: *Old age, Technology, Digital services, Digital inclusion*

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A Deep Neural Network Model to Predict Stock Prices

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Abstract

The stock market is a corporate financial environment where activities such as buying and selling the stocks of companies are carried out. Accurately predicting stock prices is critical for shareholders to take risks and make strategic decisions. However, the complexity and the non-linear dynamic nature of stock markets are the main factors that make it difficult to predict future stock prices. For this reason, the stock price prediction problem has gained a lot of interest from academia and many studies focused on the stock price prediction problem in the literature. Deep learning is one of the most common techniques widely used for predicting time series with big data. This study presents a deep neural network model to predict stocks' closings prices. The proposed methodology uses statistical features extracted from moving time windows since feature extraction is an important process in data science, especially in time-series prediction, where the target variable is mostly dependent on the previous target variables. We extracted moving time windows with different lengths for each statistical feature to more details about the short, middle, and long-term changes in the past. An experimental design is implemented to find the best number and size of moving time windows for each statistical parameter that better capture short, medium, and long-term changes in the past. Using a dataset of a public stock market for 104 stocks, the future stock prices for the next two months are predicted by minimizing the root mean square error (RMSE). The results indicate that the extracted moving statistical features effectively increase the prediction performance of the deep neural network model.

Keywords: *Stock price prediction, Deep neural networks, Time series, Feature extraction*

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Machine Learning-Based Entrepreneurial Intention Prediction Using Multiple Features

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Abstract

Entrepreneurial individuals enable the development of social capital skills, businesses, and nations. Predicting the intentions of entrepreneurial individuals is important to encourage and drive these intentions for development. Current literature use prediction scales and intention-based models to predict entrepreneurial intentions. However, these methods cannot use multiple features with a single model and overlook the existing correlation between the features. This paper proposes a machine learning method to predict entrepreneurial intentions by a single model using multiple features. A questionnaire is used to understand the effect of the features on individuals and the results are evaluated through simulations. Simulation results show the advantage of the proposed method over standard entrepreneurial intention prediction methods in terms of prediction accuracy.

Keywords: *Entrepreneurial intention prediction, Entrepreneurship, Machine learning, Multiple features*

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Comparing the Success of Imputation Methods in Missing Data Analysis

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Abstract

Before analyzing data, one of the first checkpoints is whether there is lost/missing data. The difference between the data planned to be collected in research and the data that can be collected is called missing data. If the data cannot be obtained due to any reason in the studies performed or the obtained data cannot be recorded, the problem of missing data arises. Missing data generation mechanisms are used to analyze missing data problems. These mechanisms have three basic structures depending on how the probability of occurrence of missing data is related to the data set. Understanding the missing data mechanisms in the data set is important in terms of which method to follow in the studies to be carried out on missing data. Two basic methods considered for missing data; either completely extracting from the data set or imputation by the chosen methods. In this study, on the EEG-derived GAMEEMO data set used in predicting human emotion; New data sets produced with 7 different loss rates, 3 basic loss data mechanisms and filled with 6 imputation methods are compared based on the full data set. In the first stage of the proposed study, 5%, 15%, 25%, 35%, 45%, 60% and 80% data loss was created by using the Missing at Random, Missing Completely at Random, and Missing not at Random mechanisms as the missing data mechanism. In the second stage, missing data were filled using Regression, Nearest Neighbor, Average, Expectation Maximization, Support Vector Mechanisms and Bayes Principal Component Analysis as missing data imputation methods. In the third stage, the results of these methods were compared with the measures of Mean, Covariance Matrix and Root of Error Mean Square based on the full data set. It has been observed that multiple data imputation methods give better results.

Keywords: *Missing data, EEG signals, Imputation methods*

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Training Neural Networks by Quantum Enhanced Particle Swarm Optimization

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Abstract

Artificial intelligence (AI) has become quite popular lately. Since it has numerous real-life applications varying from medicine to engineering and even to society, it has grabbed notable attention of researchers particularly in the past decades. Neural networks (NNWs), which are known to be one of the building blocks of AI, has inspired most of the developed AI architectures including deep neural networks. The merit in NNWs is indeed to form up a correct network topology by defining tailor-made hyper-parameters and choosing an appropriate training method considering the amount and the form of the related data. Training algorithms and used parameters in such algorithms should be paid special attention, because they directly affect the success of a trained NNWs. It is clear that training algorithms in NNWs can broadly be classified into two categories such as exact methods and heuristic based optimization methods. While the exact methods mainly include derivative and gradient based calculations, heuristic based optimization methods offer the opportunity of using various tools including metaheuristics, which are also quite popular in AI-based optimization. This study investigates efficiencies of different modifications on Particle Swarm Optimization, which is one of the most popular metaheuristic algorithms, in training NNWs. Several datasets have been used and all obtained results point out the efficiency of the reported modifications.

Keywords*: Artificial intelligence, neural networks, Particle swarm optimization, Quantum based search*

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Machine Learning Application for Scrap Prediction in Grinding Process

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Abstract

Quality is one of the most significant aspects of manufacturing processes. Recent developments in technology have led to the emergence of digitalization in manufacturing to improve quality. One of the main factors that directly affect the quality performance is scrap. This study is conducted in a company operating in the automotive industry to estimate scrap in a grinding machine and improve the quality and efficiency. Due to some reasons such as stone changes, the operation of the grinding machine is sometimes suspended. Before reoperation, some input parameters have to be specified by the machine operator. This manual setting depends on the experience of the operator and may lead to scrap. This study aims to avoid scrap caused by improper settings. The distinction between quality products and scrap enables us to address this study as a classification problem. We use machine learning, which is a way of identifying patterns in data and using them to make predictions, to solve this classification problem. Within the scope of this study, first, we obtain the dataset containing the input and output parameters. Then, various machine learning algorithms are applied to the dataset using Python, and the performances are compared. At the implementation stage, the estimation of the product quality will be integrated into the grinding machine. As a result of this integration, it is expected that the operator will be directed to make the proper settings, and the rate of scraps will decrease. Besides, this study will make an important contribution to the digitalization process of the company.

Keywords*: Machine learning, Scrap prediction, Grinding process*

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Performance Comparison of Recent Metaheuristic Algorithms for Dynamic Binary Optimization Problems

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Abstract

Dynamic optimization is a rapidly expanding and evolving field. Several state-of-the-art metaheuristic algorithms have been proposed to solve complex optimization problems during the past decade. Most of the new generation metaheuristic algorithms are used to address realvalued function minimization problems. Several real-life problems deal with discrete and binary spaces so that the binary dynamic optimization is still an important research subject. The present study tests the recently developed metaheuristic algorithms' performance for binary dynamic optimization problems. To this end, particle swarm optimization, grey wolf optimization algorithm, whale optimization algorithm, and sine-cosine algorithms are used to solve dynamic binary problems. The employed algorithms have been implemented in their canonical forms without any auxiliary mechanisms. Dynamic modifications of the well-known benchmarking problems such as One-Max, Plateau, Royal Road, and Deceptive functions are used to compare state-of-the-art metaheuristics performances. The employed algorithms are compared by using the well-known metrics in the dynamic optimization problems. Friedman's test, which is one of the non-parametric statistical methods, is used to validate the findings.

Keywords: *Binary optimization, Dynamic optimization, Metaheuristics*

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Earthquake Prediction with Deep Learning

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Abstract

Solving the future value estimates of the earthquake that exhibits nonlinear behavior is a rather complicated problem. There are various methods (statistical analysis, mathematical analysis, machine learning, etc.) in the literature for the solution of these problems. In particular, deep learning methods, which have become increasingly popular in recent years and widely used in machine learning, have yielded very successful results in solving complex problems. Deep learning automatically learns attributes from the available data, and this feature makes deep learning superior to other classical methods. The aim of this study is to investigate and improve the performance of deep learning methods on earthquake prediction studies. For this purpose, in our seminar study, LSTM (Long Short-Term Memory) deep neural network architecture, which is widely used to classify, process and predict time series data problems, was used. The seismic activity of Yalova, Bursa, Bilecik, Sakarya, Kocaeli and Istanbul provinces in the Marmara region, which is selected as the study area and located within the active North Anatolian Fault Line, was examined between 2007-2010. The data used in our study were subjected to normalization with min-max normalization before the deep learning model was trained. Then, in the training of the network were used as inputs meteorological data, total electron content, earthquake depth, latitude and longitude values of the locations where the earthquake occurred, radon activity concentrations. output of the network was used as earthquake magnitude values. 80% of all data was used to train the network, and 20% was used to test it. Metrics representing the performance of the applied method were calculated. This technique may offer new opportunities for earthquake prediction in the future.

Keywords: *222Rn, Total electron content, Deep learning, LSTM, Earthquake prediction, Modeling*

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Why Do Human Beings Want Robots to Have Emotions? The Cinematic Reflections of This Motivation

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Abstract

Artificial Intelligence has been one of the rising topics that is used in every aspect of human lives. From the beginning of cinema, robots, cyborgs, androids, fembots or gynoids have been used in futurist utopian or dystopian movies in a way that they were able to manage to communicate, to love, to live with people in harmony. When Fritz Lang's Metropolis was released for the first time in 1927, the film was dreaming of the twenty first century as a technological world that surrounded by robots that are smart. Today, robots are not only smart but they are about to develop emotions related to affective computing process. Although it is a known fact that science fiction stories or films are fictions that dream beyond, the idea of having robots in human shape with emotions is gaining popularity both in daily life and movies. In this sense a question such as why some movies and human beings believe and want robots to have emotions in the future rises to be questioned. This paper aims to answer this question and find out the motivation behind this belief in the light of latest developments in AI technologies and affective computing process.

Key words: *Artificial intelligence, Affective computing process, Science fiction, Robot human relationships*

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Solving Facility Location Problems with a Modified Bio-inspired Algorithm

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Abstract

In this study, the uncapacitated facility location problem is considered. The aim in UFLP is to select locations from a range of candidate locations where facilities need to be placed in order to meet customer demands with minimal cost. In the present work, to solve this problem a modified flower pollination algorithm (FPA) is proposed. The canonical version of FPA is presented first. Next, the proposed evolutionary modifications that contain crossover and mutation for FPA are reported. The algorithm is tested on well-known benchmark data which taken from the literature and its performance is compared to the results of well-known algorithms. Computational results show that the proposed algorithm produces optimal solutions for all test problems and it also outperforms all the other compared algorithms.

Keywords*: Flower pollination algorithm, Bio-inspired computation, Evolutionary algorithms, Uncapacitated facility location problem*

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Crop Detection by Deep Learning Models From Agricultural Area Images Obtained with Drone

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Abstract

Deep learning models based on artificial neural networks have led to significant developments in many areas related to artificial intelligence, primarily image processing, in recent years. One of the main reasons why deep learning models are preferred and successful is that they perform end-to-end learning. Thanks to end-to-end learning approaches, they can learn from the data itself a special set of attributes belonging to the relevant problem. In this study, the problem of detecting crops through images in agricultural areas by Drones, which are Unmanned Aerial Vehicles, was taken as basis. The purpose of the study is to classify the crops in the agricultural areas to be determined and make a distinction according to their types and thus to check whether the support given to the farmers by the state is used correctly on the crops in the area. Therefore, it is planned to prevent farmers from requesting state support over uncultivated agricultural areas. In addition, identifying products that will threaten human health by making illegal agricultural crops is among the objectives of this study. In the study, the data set will be created by accessing the images of the crops in the agricultural area with the Drone. However, in the initial phase, a total of 8775 images were used, which are the closest to the agricultural crop images and consist of 7500 training and 1275 test data provided by the ImageNet data set. First of all, feature extraction was made over ImageNet with the VGG16 architecture. A 10-layer Ensemble Neural Network (ENN) model, consisting of ResNet, Convolutional Neural Network (CNN) and VGG-16 architectures, was created. Transfer learning was performed on the Imagnet dataset using the ENN model, basic CNN and single layer VGG-16 architectures. A comprehensive analysis of the test data determined that the ENN model achieved a success rate of 99.8% and gave optimal results compared to the basic CNN and single-tactic VGG-16 architecture.

Keywords: *Deep learning, Convolutional neural network, ResNet, VGG-16, Ensemble neural network*

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Machine Learning-Based Feature Engineering for BIST 50 Index Price Prediction

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Abstract

Stock price prediction is a quite attractive topic for traders and speculators who desire to gain profit. Despite the Efficient Market Hypothesis [1] which states that “it is not possible to predict future stock price with past information due to its random walk pattern”, nowadays the idea which states that "the market efficiency is a dynamic process and therefore stock price can at least partially predictable using appropriate quantitative methods" has become a common belief for economists and statisticians [2,3]. Due to the it’s non-linear and complex structures, traditional time series methods usually fail to capture the hidden dynamics of the time series data. Machine learning methods give promising performance in learning the hidden patterns and usually produce more reliable forecasts than traditional methods [4]. On the other hand, feature engineering plays the crucial role in improving the performance of machine learning predictors by transforming data into features from the original one [5,6]. In this study, firstly, based on the one-dimensional BIST 50 index returns dataset, many features are extracted using a rolling window method over the “Close” values. After extracting the endogenous features that represent the overall behavior of raw dataset, feature selection based on the permutation feature importance technique is utilized to avoid redundant and noisy information. The created features are then fed to machine learning models as the k-dimensional input vector. In this study, Adaboost, Decision Tree and Naïve Bayes models are used and their performances are measured/compared with different evaluation metrics.

Keywords: *feature engineering, BIST 50 price index, Machine learning, Permutation feature importance*

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Problem of Approach to Artificial Intelligence in Cinema

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Abstract

Artificial intelligence has become the most important discussion of the 21st century and People's approach to artificial intelligence began to become ambivalent, just like Mary Shelley's approach to Frankenstein that she created in 1818. People are afraid of losing control while benefiting from the changes that occur as a result of the development of artificial intelligence. In addition, the experiments people have made on artificial intelligence clearly create a wave of excitement in all humanity. As a field where humanity can test what it can do with its intelligence and power, artificial intelligence appears as a techno-concept that specifically concerns much more than technology. Because of its capacity to compute data, artificial intelligence first entered human culture with chess based on mathematical data, and in 1996, the Deep Blue computer soon became able to beat the world chess champion Garry Kasparov. By 2016, artificial intelligence gave people an overwhelming advantage especially in games such as chess and Go. AlphaGo software, in addition to comfortably defeating South Korean Go champion Lee Sedaol, has developed tactics that have never been applied before, making Go masters think they cannot cope with it.2 By 2020, the GPT-3 artificial intelligence software can philosophize as a blogger, write poems, produce aphorisms, design and even interview dead historical figures like Albert Einstein.3 Although the advances made by artificial intelligence in these areas are admirable due to the fact that the mentioned fields are based on language and writing, they can be based on a certain mathematical logic. However, it is seen that artificial intelligence studies in the field of art in general and the articles examining these studies have serious problems in terms of methodology and art epistemology. In this study, while examining the ontological structure of films and scenarios produced by artificial intelligence, the philosophical and stylistic responses to the products of these artificial intelligence will be discussed.

Key words*: Artificial intelligence, Film studies, Cinema, Digital cinema*

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Transformation of Made in China Perception in Turkey: An Evaluation Based on Sentiment Analysis

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Abstract

Large companies of Chinese origin has increased share significantly in Turkish consumer electronics market. It is an undeniable fact that such products, which were evaluated with the label "Made in China" not long ago, became an actor in the consumer electronics market in a short time. In this context, in order to question the answer to the question of "what is doing right" by such companies, our study, which was prepared in order to systematically evaluate the comments made by consumers about such products, is intended to present an integrated approach with machine learning-based topical modeling and emotional analysis based on artificial neural networks. In the study, more than 500,000 comments about the Xiaomi brand, one of the largest phone manufacturers of China, were preprocessed with text mining approaches, and then these comments were categorized with machine learning based topic modelling approaches in 7 dimension from the literature review. In the last stage, in order to understand the change over the years and the position of the brand in the market, emotion analysis was performed with the TurkishBERT algorithm, which is based on artificial neural networks, and the results were evaluated. It was observed that the companies adopted approaches that prioritize the brand rather than the country image by keeping the product features high and the prices low, and then developed in dimensions such as competitiveness, supply chain and country image. It is also predicted that the results of the study provide valuable clues to the point of breaking the "Made in Turkey" perception of Turkish consumers.

Keywords*: Sentiment analysis, Topic modelling, Made in China perception, Brand trust, Country of origin effect*

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Digital Twin Creation and Use in Scheduling for Mass Manufacturing Enterprises

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Abstract

Today, the efficiency of production processes, and customer satisfaction are very important for companies that want to be leaders in the sector. Companies resort to various methods and techniques in their production processes to provide a competitive advantage in this direction. Artificial intelligence-oriented solutions have been used within the world's leading companies. Artificial Intelligence (AI) provides precise results towards the goal by ensuring that there are relationships that cannot be seen through the human eye when processing Big Data. Using the AI tools, firms can provide an instant adaptation to the changes in the production environment. In this study, the digital twin for a textile production company is created. The AI based optimization engine is used to create risk based production schedules. The data is gathered from Enterprise Resource Planning (ERP) system of the company, and Industrial Internet of Things (IIOT) devices in the manufacturing environment. Factors such as delivery time of products, cost of manufacturing, makespan are used, and various alternative scenarios are evaluated. This way, it is aimed that the company can obtain real-time schedules so that it can increase manufacturing efficiency benefitting from the digital twin.

Keywords*: Production scheduling, Industrial internet of things, Digital twins, Artificial intelligence*

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Integration of Simulation Based Production Scheduling with ERP

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Abstract

Integration of Artificial Intelligence (AI) into manufacturing processes will start replacing decision-making skills from human being to autonomous machinery. The use of real-time production data along with AI tools enables more efficient operational decisions. This approach is suitable for mass production companies as well as project type manufacturing companies. One of the most important operational decision is scheduling for these types of facilities. Although there are many different approaches, simulation is a useful tool to obtain effective production schedules. In this study, the manufacturing process of a shipyard company is modelled using discrete event simulation technique by gathering data from the Enterprise Resource Planning (ERP) system. The AI based scheduling module is used to create risk based production schedules. This newer approach creates schedules that provides an instant adaption of changing production environment because of changing real-time parameters. In this research, different factors such as delivery time of products, cost of manufacturing, makespan are considered. Various alternative scenarios are developed to understand the insights on how production efficiency can be increased especially for project type manufacturing facilities.

Keywords*: Enterprise resource planning, Project type production, Simulation, Production scheduling, Production planning*

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Developing a Decision Support Model Enriched with Data Analytics Methods for Employee Selection Preliminary Evaluation Processes

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Abstract

Selecting the most suitable candidate for the vacancy is one of the important problems of the companies. Because sometimes there can be hundreds of applications for a single position, the right candidate can be chosen for a long time and at a high cost. This study aims to develop a decision support system model enriched with data analytics prediction models in order to increase the efficiency of recruitment pre-evaluation processes. The development of such a model requires an interdisciplinary approach that includes many different areas, primarily human resources management, data analytics, and decision theory. Therefore, the interdisciplinary approach competence obtained through the realization of the model has the potential to develop a career in terms of machine learning and the use of artificial intelligence in human resources processes. Moreover, it is important to use prediction models created with decision making and data analytics methods instead of classical candidate selection methods to ensure that the most suitable candidate is recruited. It will be a unique aspect of the study to show that these two approaches will be handled together with the input-output relationship in employee selection and their results will be compared theoretically, and that text matching can also be used by participating in decision making.

Keywords*: Employee selection, Data analytics, Software development, Weighting, Decision support system*

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Prediction of the Aerodynamic Properties of the Airfoil-shaped Profiles Using Support Vector Regression Model

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Abstract

An airfoil, designed to get aerodynamic lift force from the fluid moving around it, is the basic cross-sectional shape of an airplane wing, a wind turbine rotor, or a turbine blade. The optimization of the airfoil is of vital importance, considering that the performance of the airfoil can increase efficiency and reduce the cost. In real-world engineering problems, many costly experiments or time-consuming simulations are required to achieve the most appropriate design. Nevertheless, creating approximation models, known as surrogate models, can replicate the simulation as close as possible in less computation time.

In our study, aerodynamic performance of the airfoil-like structures, which were randomly generated by using several parametrization methods, were analyzed with an open source computational fluid dynamics (CFD) solver OpenFOAM and the collected data were utilized to train Support Vector Regression (SVR) model. Consequently, the predictions of the SVR model have also made it possible to solve the wind turbine optimization problems with much less computational cost / time instead of running thousands of simulations required.

Keywords*: Machine learning, Support vector regression, Computational fluid dynamics, Wind turbine optimization, Airfoil design*

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Usability of Artificial Intelligence Applications in Hospital Information Management Systems

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Abstract

Problem

Healthcare institutions are large organizations with a matrix structure, with a variety of services, wide staff and patient numbers. Hospital Information Management Systems (HIMS) used in hospitals are automation systems that are constantly developed and consist of modules. The necessity of integrating HIMS with other institutions and ministry systems may cause some incompatibilities. In addition, newly added modules and legal requirements also require updates in HIMS. A continuous effort is made to improve HIMS.

Plan and Methodology

In the first part of the study, the definition, usage areas and sub-components of artificial intelligence are compiled. In the second part of the study, Hospital Information Management Systems are introduced and information is compiled. In the next section, artificial intelligence applications that can be developed for HIMS are mentioned.

Main Findings

HIMSs used in health institutions consist of a wide variety of sub-modules. There is a search for increasing their functionality and using them with some decision support systems. The healthcare industry has a pioneering infrastructure and database for artificial intelligence-based applications.

Key Results

Seven sub-modules are discussed for hospital information management systems. Artificial intelligence subcomponents that can be used for these have been studied together with their justifications. Steps are determined for artificial intelligence-based algorithms that can be developed in modules.

Keywords*: HIMS, Hospital information management system, Artificial intelligence, Hospital management, Health institutions management*

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Artificial Intelligence Applications Used in Recruitment Process for Human Resources Management

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Abstract

Problem

Providing permanent superiority to competitors in an intense competitive environment for businesses; It passes through having and managing a valuable, flexible, constantly improving, open-to-change human resources. The use of Artificial Intelligence in human resources and recruitment activities brings some advantages and disadvantages. In addition, the need to introduce new applications has emerged for small businesses that have not yet used this new technology.

Plan and Methodology

In the first part of the study, definition of artificial intelligence, usage areas and sub-components are given. In the second part of the study, recruitment processes are explained and the stages in the recruitment process are specified. In the third part of the study, artificial intelligence algorithms are specified in the recruitment processes and the programs used in this process are explained.

Main Findings

Artificial intelligence; It is functional in managing the recruitment process and also in reducing human bias. Existing artificial intelligence-based programs are a set of systems that start from Cv scanning, reach a video interview, and transmit and evaluate various forms and intermediate processes to the candidate. It is designed to both ease the workload and help find the right talent. In order to do all these, programs used in human resources recruitment processes have been designed. Among these, programs such as Mya, Hirevue, Humantelligence, Ideal come first.

Key Results

Artificial intelligence; It is functional in managing the recruitment process and also in reducing human bias. Existing artificial intelligence-based programs are a set of systems that start from Cv scanning, reach a video interview, and transmit and evaluate various forms and intermediate processes to the candidate. It is designed to both ease the workload and help find the right talent. In order to do all these, programs used in human resources recruitment processes have been designed. Among these, programs such as Mya, Hirevue, Humantelligence, Ideal come first.

Keywords*: Artificial intelligence, HRM, Human resources management*

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Artificial Intelligence Applications for Job Training-Health Sector Workers

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Abstract

Problem

Especially efforts to develop employees in the health sector are considered very important. Difficulties are experienced in the programming and execution of training activities. The fact that employees receive a large number of training and follow-up on the basis of departments and within the framework of their existing certificates creates operational difficulties.

Plan and Methodology

In this study, the concept of artificial intelligence is introduced in the first section. In the next section, the use of artificial intelligence in medicine and in-service training is mentioned. In the next section, ITS smart lesson system is introduced. Artificial intelligence-based architecture of ITS is mentioned and how health institutions can be used in the training of human resources.

Main Findings

It is possible to evaluate a large number of data of a large number of patients together in healthcare institutions through information systems. The same facility is also available for processing the data of many employees in many departments. Institutions have started to use artificial intelligence-based applications in personnel training or are investigating what can be done in this field.

Key Results

A smart tutoring system (ITS) aims to provide customized training and feedback for students, often without requiring a human teacher intervention. ITS can program the training needs of institutions and individuals by using various artificial intelligence-based computer technologies and can facilitate training. Investments in this area continue. The architecture of intelligent teaching systems and some of the problems experienced are mentioned.

Keywords*: Artificial intelligence, Job training, Hospital management, Health institutions management*

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Use of Artificial Intelligence for Performance Evaluation - Healthcare Sector Employees

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Abstract

Problem

Monitoring performances is required from many points. Especially in the health sector, there is teamwork and matrix organization structure. Personal performances also affect team performance. In addition, there is a problem of fair distribution of revolving fund shares in health institutions. For these reasons, remedies are sought to make performance appraisal more accurate.

Plan and Methodology

In this study, the concept of artificial intelligence is introduced in the first section. In the next section, performance evaluation methods available in health institutions are examined. The forms and systems used for this purpose are introduced. In the next section, performance calculations based on automation in health institutions are mentioned. In the next section, steps on how artificial intelligence-based performance evaluation can be are introduced.

Main Findings

Performance evaluation systems can be quite complex and versatile in healthcare institutions where many different procedures are performed and there are many employees. The ideal point has not been reached. There are many complaints. In addition, existing systems are mostly designed for the distribution of revolving funds.

Key Results

It is inevitable that artificial intelligence applications are used in performance evaluation. The versatility of the business, the variety of services, the high number of employees, the services and results spread over time make manual performance evaluation difficult. An algorithm example was tried to be created on how to use artificial intelligence sub-applications in which steps of performance evaluation.

Keywords*: Artificial intelligence, Performance evaluation, Hospital management, Health institutions management*

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Suggestion for Developing Steps of Artificial Intelligence Based Customer Relations Management Automation in Banking

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Abstract

Problem:
The finance sector and especially banks are institutions with a wide variety of customers. Communication and customer relationship management with customers reaching tens of millions requires a rather burdensome organization and investment. Algorithms are needed to inform customers' obligations of operators and carry out marketing activities with minimum search and labor.
Plan and Methodology
In the first part of the study, the definition and usage areas of artificial intelligence are given. In the second part of the study, customer relationship management in banking is examined. In the next section, CRM automation systems used in banks are introduced. In the next section, steps on how to produce artificial intelligence-based algorithms are shown through a sample application, taking into account the operational processes of banks.
Main Findings
Banks use and develop automation systems in terms of customer relationship management. However, there is a need for artificial intelligence-based applications. In addition to the minimum number of calls to a large number of customers, there is a need for the integration of branch and central operations for optimum use of the number of employees.
Key Results
Basic steps in the production of artificial intelligence-based algorithms suitable for CRM operations have been determined. Two basic needs have been identified in CRM operations. The first is an artificial intelligence-based algorithm for creating the interview plan and contents. The second is an artificial intelligence-based algorithm for scheduling meetings and working times. Eight steps are determined for the artificial intelligence algorithm to be written about these two basic functions.

Keywords*: Banking, Artificial intelligence, Customer relationship management, CRM, Bank management*

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Socializing AI from the Side of System Theory

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Abstract

System theory explains an entity with its environment. The reason for the presence of every entity should be based on relationships with the others. This approach composes networks which consist of entities as actors and relationships as ties. Therefore, artificial systems are designed with attributes in order to hold its values and methods in order to interact with other unnatural systems such as another machine or natural systems such as human. Also the relations among entities should be regulated vertically and horizontally in order to supply hierarchy of controls. Because of this need, in 1990s, software development technology has been reorganised as Object Oriented form in order to model the mentioned fact. As an example; IoT is the fiction of artificial systems which are talking to each other without human contribution. This article aims to draw the place of AI technologies in the Systems' world. This subject will be also criticized in terms of Human Machine Interaction (HMI).

Keywords*: Object oriented design, Human-machine interaction, Artificial intelligence, System theory, Social network analysis*

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People's Perspectives Related to Studies Vaccine for Covid-19

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Abstract

Vaccines, which are defined by the World Health Organization as practice that reduces the risk of getting sick by working with the body's natural defenses to provide protection, and immunization are a success story of global health and development saved millions lives each year. The importance of vaccines, which are at a critical in history of humanity, were noticed once again with Covid-19, thought to have emerged for the first time in December 2019. It can be said that as vaccines are frequently discussed among people and their importance is understood more, anti-vaccination ideas are also increasing. Especially the news published and the way they present this news can directly affect people's perspectives on vaccines. In this study, people's perspective on vaccination in the pandemic process caused by covid-19 will be evaluated in general. In addition, until from at the beginning of 2020 to today, people's perspectives on vaccination studies for Covid-19, which affects the whole world, will be evaluated, and these perspectives will be investigated whether it change. When determined differentiation of people's vaccine approach, this reason of difference and how new developments occurring during the pandemic period affect people will be searched. While measuring the perspectives of people on vaccine studies, necessary pre-processing steps will be applied on the data acquired using open source programming language. Once step of cleaning data, sentiment analysis will be use for measure people's perspectives by means of this clean data. It is planned to apply sentiment analysis processes with the Turkish-Bert model, which has been trained with a large data set. Through this model, positive/negative evaluations of individuals about the vaccine can be classified.

Keywords*: Covid-19, Vaccine, Immunization, Anti-vaccination, Sentiment analysis, Machine learning*

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Comparison of Dictionary-Based Approach and Machine Learning Techniques in Aspect-Based Sentiment Analysis Studies: The Sample of Educational Institutions

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Abstract

In this study, an aspect based sentiment analysis study was conducted using the comments data collected from okul.com.tr platform. After collecting comments on okul.com.tr platform, aspects in each comment have been identified. Each comment was tagged by adding the moods of aspects. This labeling process was controlled by different people. Two different dictionaries (Sentiwordnet and Sentiturknet) were used for dictionary-based approach. The success rates achieved were in between 84% and 87%. A machine learning model has been developed using multilayer artificial neural networks. Some of the labeled comments data (70%) was used for the training of the model and the other part (30%) was used for testing the model. 90% - 95% success rates were achieved on the data set used with the model.

Keywords*: Data mining, Machine learning, Artificial neural network, Sentiment analysis*

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The Effect of Deep Learning Model Parameters on Model Performance

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Abstract

Diabetes is a chronic disease that occurs when the sugar level in the blood circulation system rises above normal. In this study, we predicted diabetes by using Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN) and Long Short Term Memory (LSTM) from deep learning architectures. To find the best classification model in deep learning, we created 24 different models for each of the CNN, RNN and LSTM by using different activation and optimization functions and changing the number of neurons. According to the experimental data obtained; RNN gave the highest performance (82% class accuracy) with 32 neurons in the hidden layer, ReLU activation function and RmsProp optimization parameters; LSTM gave the lowest performance (63% class accuracy) with 64 neurons in the hidden layer, ReLU activation function and Adam optimization function parameters. In addition, we examined the effects of parameter optimization on deep learning algorithms within the scope of the study. Small changes in parameter values lead to large differences in model performance. As a result, parameter optimization is critical in deep learning.

Keywords*: Diabetes, Deep learning, Recurrent neural network, Convolutional neural networks, Long short term memory, Parameter optimization*

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An Image Analysis Technique for Retinal and Choroidal Assessment in the Follow up of a Medical Condition: Carotid Cavernous Fistula

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Abstract

INTRODUCTION: Carotid Cavernous Fistula (CCF) is a vascular disease that consists of an abnormal shunt between the carotid artery and cavernous sinus. Optical Coherence Tomography (OCT) is a useful diagnostic tool in many ophthalmological conditions related to the retina and choroid. OCT images are the right candidate for image analysis programs and can be evaluated using different indexes such as choroidal vascularity index (CVI). In this study we aimed to evaluate the retinal and choroidal changes in the clinically affected and non-affected eye of patients with CCF utilizing novel OCT indexes via image processing.

MATERIAL AND METHOD: In this longitudinal observational study, Spectral Domain – Enhanced Depth Imaging – Optical Coherence Tomography (SD-EDI-OCT) (Heidelberg Spectralis, Heidelberg Engineering, Heidelberg, Germany) images of 21 patients with angiographically proven unilateral CCF with anterior drainage were evaluated for central foveal thickness (CFT), subfoveal choroidal thickness (SFCT), choroidal vascularity index (CVI), stromal area percent (SAP), luminal to stromal ratio (LSR), total choroidal area (TCA), luminal choroidal area (LCA) and stromal choroidal area (SCA) for two-time points before and after resolution of the fistula.

RESULTS: There were 21 subjects in the study with a female to male ratio of 14:7 (66.7% / 33.3%) and a mean age of 56.86 ± 19.38 years. Right eye was affected in 5 (23.8%) and left eye was affected in 16 (76.2%) subjects. Mean time between OCT images was 174.57 ± 151.90 days. CFT, SFCT, CVI, SAP, LSR, TCA, LCA and SCA values were similar between the clinically affected eyes and the non-affected eyes for the initial OCT time point (p=0.418, p=0.230, p=0.608, p=0.608, p=0.726, p=0.604, p=0.639, p=0.587, respectively) and the last OCT time point (p=0.473, p=0.485, p=0.912, p=0.912, p=0.787, p=0.254, p=0.247, p=0.289, respectively).

CONCLUSION: Emerging technology has improved the diagnosing technology combining AI and medicine. Artificial intelligence can benefit from image analysis tools and various indexes that differentiate diseases from each other as well as disease progression. Our data show for the first time that, although clinically not evident, anterior drainage CCFs could affect both eyes. These unique parameters can be used for indexing image analysis parameters for AI. Besides newsworthy value, future studies can improve the diagnosis scheme using these unique parameters to train AI and make a proper clinical decision support system.

Keywords*: Image processing, Image analysis, Medicine, Ophthalmology, Carotid cavernous fistula*

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Time-Series to Image Conversion Based Feature Fusion Method for Underwater Object

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Abstract†

Sonar is a system used to obtain information about the size, distance, direction and other properties of objects with sound waves. It is used for underwater oil exploration, seafloor mapping, tracking fisheries, detecting mines, and similar objects. Sonar systems, which are frequently used not only in war, but especially in peace, to protect coastal security, to perform ship landings and port controls in a robust manner, offer even more advanced opportunities in newly emerged areas with the development of technology. There are many studies in the literature in which classical machine learning methods are used for the classification of sonar signals. In this study, different from the classical methods used before, it is proposed to represent sonar data in a different format using three different mathematical transformation methods with an innovative approach and to be transformed into image format and classified by a deep learning algorithm. In addition to this approach, the singular value decomposition method (SVD) was applied after converting the data into matrix form, which is the first step of mathematical transformation. For each data in the data set, images obtained from 3 different mathematical transformations and the singular value decomposition method were applied, were transformed into a single image by fusion method. In this way, a Convolutional Neural Network architecture, which is widely used in image processing among deep learning methods, has been designed, and applied for this classification problem. This new method proposed has provided the highest success rate known in the literature so far.

Keywords*: GAF, MTF, RP, Sonar, CNN*

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An AI Powered Computer Vision Application for Airport CCTV Users

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Abstract†

The aviation industry is having a hard time due to the Covid-19 pandemic, and it has become more important than ever to use existing equipment for different purposes available in the airports. In this direction, generating new data with AI techniques by using existing CCTV cameras for airport securities operations, even if they are not produced for AI purposes, becomes a new way to generate valuable business for the sector's technology providers. In this study, following this trend, a computer vision application has been developed to work on the airport CCTV camera images in real-time by using open-source libraries defined by literature review and enables the detection of objects such as people, luggage, and vehicles. Also, the detection performance measurements and achievements of the application are shared.

Keywords*: Artificial intelligence, Machine learning, Deep learning, Human detection, Airport, Security, CNN, CCTV*

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Gender Classification with Low-Power Laser Signals

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Abstract[†]

Gender classification can provide significant advantages in applications with access control, marketing activities and biometric verification processes. In cases where the entries to some areas are only male or female, advertising products according to the number of male and female in the store or reducing the database usage burden by primarily gender discrimination in biometric verification can be given as examples of gender classification practices. Gender classification is a binary classification problem as male or female. In traditional methods, gender classification has been made from facial images. One of the biggest difficulties in gender classification from facial images is that the person's face cannot be kept in a certain position, while other is the difficulties in the imaging stage. The desire of the person to hide herself from the cameras, differences in the face and lighting conditions can be given as examples of the difficulties of the image-based methods. In this study, we propose gender classification with low-power laser beams instead of traditional camera-based method of gender classification. For this purpose, a low-power laser beam is projected on the subjects' arm for a short time. Laser signals reflected from the arm of subjects are classified according to the LSTM deep learning architecture after data preparation, and the subjects' gender is determined. The average classification rate is calculated as 76.2%. The results show that gender classification can be performed with laser signals. Another advantage of this method is that the arm can be easily positioned at the desired location during the receiving signal from the person's arm.

Keywords*: Gender classification, Laser, LSTM, Deep learning, Gender detection, Gender prediction, Gender recognition, Sex classification, Signal processing*

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Ensemble NASNet Deep Feature Generator Based Underwater Acoustic Classification Model

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Abstract†

In this study, a deep learning and machine learning-based hybrid method were proposed for underwater sound direction detection. A microphone was placed underwater to generate the dataset. The sounds of the propellers of the Remotely Operated Underwater Vehicle (ROV) moving underwater were collected. First, sound recording was made underwater without movement. The underwater robot moved in x, y, and z axes, and a sound dataset was created. This dataset consists of four classes in total. NASNetLarge and NASNetMobile deep learning models have been applied for feature extraction on these sounds. Chi2 method was used to select the most weighted features from the obtained features. Then, Support Vector Machine (SVM) algorithm was used to classify the selected features. In classification, 77.66% accuracy was calculated with the Linear SVM algorithm.

Keywords*: Underwater sound classification, Underwater direction detection, SVM, Deep learning, NASNetLarge, NASNetMobile*

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Digital Transformation of CPR Mannequins in Medical Education with Artificial Intelligence Classifier

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Abstract[†]

Today the reflection of digital transformation which started with Industry 4.0 in the field of health has also gained momentum in medical education with simulation centers established especially in medical schools. In this study, the data which attained by messaging mechanical CardioPulmonary Resuscitation (CPR) first aid training manikin via electronic equipment developed modularly are collected. These data are also processed through the developed software which provides them to communicate with both mobile devices and desktop computers and the validity of the massage activity performed with an Artificial Intelligence (AI) algorithm is verified. The modular kit has been developed in the Informatics Department Open Source Laboratory (KOUOSL) with the support of Kocaeli University Faculty of Medicine Dean's Office and the Department of Emergency Medicine. An ideal CPR massage interval is expressed as compression of 100-120 times per minute and application to the chest at a depth of approximately 5-6 cm. In order to determine the validity and accuracy of the cardiac massage in the study, feedback is provided on whether an ideal massage was performed to the Observer Trainer with an AI classifier based on the data collected from the sensors placed on the manikin. Thus, by digitizing the mechanical mannequin, a more effective practical training application will be developed and provided.

Keywords*: CPR manikin, ANN, Digital transformation, Classifier, Medicine*

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Detecting COVID-19 Pandemic Using Sentiment Analysis of Tweets

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Abstract[†]

In 2019 Word faced a different challenge in the face of COVID-19, which started from Wuhan within two months spread to 212 countries. Due to its spread, governments decided to shut down it cites, which helped slow the spread of COVID-19 first wave. Due to economic issues, countries can't extend this lockdown for a more extended period, and they have to ease it. Due to this, health institutes and policymakers are afraid of the second wave, which can be more dangerous and can affect more people than the first wave. Developing countries that spend less on their health sector can be affected more by this wave. The test ratio over a thousand in countries like India, Pakistan, and Bangladesh are averagely calculated as 2.37. So, a technique is needed to get the actual count of people who may be affected by COVID-19 so the governments can arrange facilities for them and prediction can be made. In this research, we proposed a system in which we can detect COVID-19 Pandemic Using sentiment analysis of Tweets. In this research, we implement some data mining and classification techniques to complete our research.

Keywords*: Twitter, COVID-19, Sentiment analysis, Machine learning, Data mining.*

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Efficient Liver Cancer Detection Considering Mamdani Fuzzy Logics Based Simulations Environment

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Abstract†

In the past few years, widespread cough disease is common in developing countries nowadays. Mostly the people were dying due to unawareness of liver cancer disease. The purpose of this paper is to diagnose the liver cancer using Mamdani fuzzy inference system design based on Fuzzification, de-fuzzification and some set of rules. In paper, the input for the liver cancer diagnose is only through red blood cells using variable AST, ALT, Protien or Bilirubin and in return of output shows whether the patient has liver cancer or not. The diagnose formulation was carried out through MATLAB simulations. This paper provides close to an accurate analysis of the results. Moreover, the results are compared with the websites and articles for more accuracy.

Keywords*: Fuzzification, De-fuzzification, Liver cancer detection, Disease, Mamdani, Matlab simulations*

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Evaluation of Daily Living Activities Using Cloud Base Smart-Phone and Smart-Watch Base Biometric System Empowered with Fuzzy Logic

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Abstract†

Smart phone and smart watch is advancing technology in our world and that is easily available in the consumer market. Mostly wearable devices are used by majority of people for example currently smart watch and wrist band are available in everywhere in the consumer market and they frequently process inertial motion sensor (gyroscope and accelerometer) as well as detect biological information sensing hardware as photoplethysmographic signals skin temperature and many other. As of now client validation from wearables is an entirely reasonable methodology in those situations where the arrangement of cameras in unrealistic. In this article, we proposed a **fuzzy** based smartphone and smart watch biometric system using cloud. Fluffy rationale is a type of many-esteemed rationale where truth estimation of variable might be any genuine number. **Fuzzy inference system** stands as a system that take input and process them on based on pre specified rule to produce output. Both the input and output are real value.

Keywords*: Authentication, Biometric, Identification, Sensor, Smart-phone, Smartwatch*

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Artificial Intelligence As A Means Of Infantilization

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Abstract†

The exponential digitalization of products and services, as well as the changing facades of reality, provide a larger area for AI in everyday life. The automatized habits, full of lists of likes and dislikes created by opinion leaders, proclaimed future designers, or common post-world paradigms, arose from the pseudo-reality of post-traumatic human behaviors regarding consumerism society.

In response to Stiegler's criticisms of Goffman and Bernardini's approach to infantilization, AI appears in all contexts in the modern World surrounding us from simple home equipment to 3D printers, from smart buildings to precision agriculture. On the one hand, real AI advancements grasp more value, space, and interest in real life, but they also flourish in cinema as a fantasy world. This paper aims to question how cinematic imagination intersects with reality in science fiction films, with an emphasis on AI representation in cinema films.

Keywords*: AI, Cinema Films, Infantilization, Smart cities, Space*

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Face Mask Detection on LabVIEW

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Abstract†

The world is facing a huge health crisis due to the coronavirus pandemic (COVID-19). The World Health Organization(WHO) has issued that the most effective preventive measure against the rapid spread of coronavirus is wearing a mask and keeping social distance in public places and crowded areas. Various studies have proven that wearing a face mask significantly reduces the risk of viral transmission, and also provides a sense of protection for people. But it is difficult to monitor and control people manually, especially in crowded areas. In this study, a deep learning model is proposed to automatically detect people wearing face masks or not. The pre-trained Faster R-CNN Inception V2 deep learning model is fine-tuned with the transfer learning method, and trained and tested on the Simulated Masked Face Dataset (SMFD). The model trained in the TensorFlow environment is accurate enough to detect the face mask. Thus, face mask detection is performed with the interface created on LabVIEW and a safe working environment can be maintained by controlling security violations in public living areas under control.

Keywords*: COVID-19, Face mask, Deep learning, Faster R-CNN inception V2, Transfer learning*

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Financial Instrument Forecast with Artificial Intelligence

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Abstract[†]

In ancient times, trade was carried out by barter. With the use of money and similar means, the concept of financial instruments emerged. Financial instruments are tools and documents used in the economy. Financial instruments can be Foreign exchange rates, securities, crypto currency, index, and funds. There are many methods used in financial instrument forecast. These methods include technical analysis methods, basic analysis methods, forecasts carried out using variables and formulas, forecasts carried out using time-series algorithms, and forecasts carried out using artificial intelligence algorithms. Within the scope of this study, the importance of the use of artificial intelligence algorithms in the financial instrument forecast is studied. Since financial instruments are used as a means of investment and trade by all sections of the society, namely individuals, families, institutions, and states, it is highly important to know about their future. Financial instrument forecast can bring about profitability such as increased income welfare, more economical adjustment of maturities, creation of large finances, minimization of risks, spreading of ownership to the grassroots, and more balanced income distribution. Within the scope of this study financial instrument forecast is carried out by applying a new method with Long Short Term Memory(LSTM), Recurrent Neural Network(RNN), Convolutional Neural Network (CNN), Autoregressive integrated moving average(ARIMA) algorithms, and Ensemble classification boosting method. Financial instrument forecast is carried out by creating a network compromising LSTM and RNN algorithm, an LSTM layer, and an RNN output layer. With the ensemble classification boosting method, a new method that gives a more successful result compared to the other algorithm forecast results was applied. At the conclusion of the study, alternative algorithm forecast results were competed against each other and the algorithm that gave the most successful forecast was suggested. The success rate of the forecast results was increased by comparing the results with different time intervals and different training data sets. Furthermore, a new method was developed using the ensemble classification boosting method, and this method yielded a more successful result than the most successful algorithm result.

Keywords*: Long short-term memory (LSTM), Convolutional neural network (CNN), Recurrent neural network (RNN), Boosting, Financial instrument forecast*

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Creating Brand Image Profile by Social Media Analysis

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Abstract†

The purpose of creating a brand image profile is to measure the brand perception of consumers considering brand attributes. Thus, marketing decisions can be made based on the brand's strengths and weaknesses by determining them. The brand image profile is traditionally created using the attitude scales and surveys. However, alternative methods are needed since the questionnaires' responses are careless, and the number of participants is relatively low, and the cost per participant is high. In this study, as an alternative method, creating a brand image profile by analyzing social media data with artificial intelligence was made for the iPhone product. Firstly, the focus group study determined the attributes related to the last version of the iPhone. Then, between December 17th, 2019, and March 23rd, 2020, 87,227 tweets that include these attributes in English were collected from the Twitter social media platform through the RapidMiner data mining tool. Sentiment analysis was performed on collected tweets by the MeaningCloud text mining tool. In this analysis, positive and negative emotions were tried to be detected through artificial intelligence algorithms. Net Brand Reputation Score (NBR) was calculated using the positive and negative tweets amount for each attribute separately. Brand image profile was created by skew analysis using NBR values. As a result, it is thought that social media analysis can be a complementary method that can be used with traditional methods in creating a brand image profile. So it is seen as an inevitable method to use in further studies to make sentiment analysis by processing raw data received from the Social Media platforms through artificial intelligence algorithms to transform the product label or the perspectives of an event into meaningful information.

Keywords*: Social media analysis, Brand image profile, Text mining, Net brand reputation, Twitter, Sentiment analysis*

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Measurement of Employees on Human Resources with Fuzzy Logic

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Abstract†

Artificial intelligence, which is the indispensable technology of our age, has started to gain a place in many institutions. Institutions give great importance to human resources management because hiring the right employee for the job will increase productivity within the organization. When recruiting personnel for the position, human resources face difficulties such as measuring the success levels of applicants and deciding whether they are suitable. In this study, in order to provide solutions to the difficulties encountered, a decision-making mechanism is created by using the fuzzy logic method, which is one of the artificial intelligence techniques. This decision-making mechanism measures the performance of people applying for recruitment. While measuring performance, all applications are taken into consideration, and a rule base is formed according to graduation status and experience. The system, which is based on this rule base, evaluates people according to the inputs and finds out their success levels in return. According to the results, it is decided whether the persons are suitable for the position sought. When human resources departments in corporations are combined with artificial intelligence technologies, an advantage will be achieved in the competitive environment between corporations.

Keywords*: Human resources, Artificial intelligence, Fuzzy logic, Performance measurement*

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