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PREDICTING LEARNERS PERFORMANCE USING ARTIFICIAL NEURAL NETWORKS IN LINEAR PROGRAMMING INTELLIGENT TUTORING SYSTEM

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ABSTRACT

In this paper we present a technique that employ Artificial Neural Networks and expert systems to obtain knowledge for the learner model in the Linear Programming Intelligent Tutoring System(LP-ITS) to be able to determine the academic performance level of the learners in order to offer him/her the proper difficulty level of linear programming problems to solve. LP-ITS uses Feed forward Back-propagation algorithm to be trained with a group of learners data to predict their academic performance. Furthermore, LP-ITS uses an Expert System to decide the proper difficulty level that is suitable with the predicted academic performance of the learner. Several tests have been carried out to examine adherence to real time data. The accuracy of predicting the performance of the learners is very high and thus states that the Artificial Neural Network is skilled enough to make suitable predictions.

KEYWORDS

Linear Programming, Intelligent Tutoring System, backprobagation, Artificial Neural Network.

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A NOVEL SCHEME FOR ACCURATE REMAINING USEFUL LIFE PREDICTION FOR INDUSTRIAL IOTS BY USING DEEP NEURAL NETWORK

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ABSTRACT

In the era of the fourth industrial revolution, measuring and ensuring the reliability, efficiency and safety of the industrial systems and components are one of the uppermost key concern. In addition, predicting performance degradation or remaining useful life (RUL) of an equipment over time based on its historical sensor data enables companies to greatly reduce their maintenance cost. In this way, companies can prevent costly unexpected breakdown and become more profitable and competitive in the marketplace. This paper introduces a deep learning-based method by combining CNN(Convolutional Neural Networks) and LSTM (Long Short-Term Memory)neural networks to predict RUL for industrial equipment. The proposed method does not depend upon any degradation trend assumptions and it can learn complex temporal representative and distinguishing patterns in the sensor data. In order to evaluate the efficiency and effectiveness of the proposed method, we evaluated it on two different experiment: RUL estimation and predicting the status of the IoT devices in 2-week period. Experiments are conducted on a publicly available NASA's turbo fan-engine dataset. Based on the experiment results, the deep learning-based approach achieved high prediction accuracy. Moreover, the results show that the method outperforms standard well-accepted machine learning algorithms and accomplishes competitive performance when compared to the state-of-the art methods.

KEYWORDS

Industrial IoT, Remaining Useful Life, Predictive Maintenance, Deep Learning, Industry 4.0, Prognostics and Health Management

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A COMPARATIVE STUDY OF LSTM AND PHASED LSTM FOR GAIT PREDICTION

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ABSTRACT

With an aging population that continues to grow, the protection and assistance of the older persons has become a very important issue. Fallsare the main safety problems of the elderly people, so it is very important to predict the falls. In this paper, a gait prediction method is proposed based on two kinds of LSTM. Firstly, the lumbar posture of the human body is measured by the acceleration gyroscope as the gait feature, and then the gait is predicted by the LSTM network. The experimental results show that the RMSE between the gait trend predicted by the method and the actual gait trend can be reached a level of 0.06 ± 0.01. And the Phased LSTM has a shorter training time. The proposed method can predict the gait trend well.

KEYWORDS

Elderly people fall, Acceleration gyro, Lumbar posture, Gait prediction, LSTM

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MOTION PREDICTION USING DEPTH INFORMATION OF HUMAN ARM BASED ON ALEXNET

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ABSTRACT

The development of convolutional neural networks(CNN) has provided a new tool to make classification and prediction of human's body motion. This project tends to predict the drop point of a ball thrown out by experimenters by classifying the motion of their body in the process of throwing. Kinect sensor v2 is used to record depth maps and the drop points are recorded by a square infrared induction module. Firstly, convolutional neural networks are made use of to put the data obtained from depth maps in and get the prediction of drop point according to experimenters' motion. Secondly, huge amount of data is used to train the networks of different structure, and a network structure that could provide high enough accuracy for drop point prediction is established. The network model and parameters are modified to improve the accuracy of the prediction algorithm. Finally, the experimental data is divided into a training group and a test group. The prediction results of test group reflect that the prediction algorithm effectively improves the accuracy of human motion perception.

KEYWORDS

Human Motion, Prediction, Convolutional Neural Network, Depth Information

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A Novel Feature Engineering Framework In Digital Advertising Platform

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ABSTRACT

Digital advertising is growing massively all over the world, and, nowadays, is the best way to reach potential customers, where they spend the vast majority of their time on the Internet. While an advertisement is an announcement online about something such as a product or service, predicting the probability that a user do any action on the ads, is critical to many web applications. Due to over billions daily active users, and millions daily active advertisers, a typical model should provide predictions on billions events per day. So, the main challenge lies in the large design space to address issues of scale, where we need to rely on a subset of well-designed features. In this paper, we propose a novel feature engineering framework, specialized in feature selection using the efficient statistical approaches, which significantly outperform the state-of-the-art ones. To justify our claim, a large dataset of a running marketing campaign is used to evaluate the efficiency of the proposed approaches, where the results illustrate their benefits.

KEYWORDS

Digital Advertising, Ad Event Prediction, Feature Engineering, Feature Selection, Statistical Test, Classification, Big Data.

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DATA MINING FOR INTEGRATION AND VERIFICATION OF SOCIO-GEOGRAPHICAL TREND STATEMENTS IN THE CONTEXT OF CONFLICT RISK

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ABSTRACT

Data mining enables an innovative, largely automatic meta-analysis of the relationship between political and economic geography analyses of crisis regions. As an example, the two approaches Global Conflict Risk Index (GCRI) and Fragile States Index (FSI) can be related to each other. The GCRI is a quantitative conflict risk assessment based on open source data and a statistical regression method developed by the Joint Research Centre of the European Commission. The FSI is based on a conflict assessment framework developed by The Fund for Peace in Washington, DC. In contrast to the quantitative GCRI, the FSI is essentially focused on qualitative data from systematic interviews with experts. Both approaches therefore have closely related objectives, but very different methodologies and data sources. It is therefore hoped that the two complementary approaches can be combined to form an even more meaningful meta-analysis, or that contradictions can be discovered, or that a validation of the approaches can be obtained if there are similarities. We propose an approach to automatic meta-analysis that makes use of machine learning (data mining). Such a procedure represents a novel approach in the meta-analysis of conflict risk analyses.

KEYWORDS

Integration, Data mining, Conflict Risk , Fragile States Index (FSI)

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SELF LEARNING COMPUTER TROUBLESHOOTING EXPERT SYSTEM

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ABSTRACT

In computer domain the professionals were limited in number but the numbers of institutions looking for computer professionals were high. The aim of this study is developing self learning expert system which is providing troubleshooting information about problems occurred in the computer system for the information and communication technology technicians and computer users to solve problems effectively and efficiently to utilize computer and computer related resources. Domain knowledge was acquired using semistructured interview technique, observation and document analysis. Domain experts were purposively selected for the interview question. The conceptual model of the expert system was designed by using a decision tree structure which is easy to understand and interpret the causes involved in computer troubleshooting. Based on the conceptual model, the expert system was developed by using 'if – then' rules. The developed system used backward chaining to infer the rules and provide appropriate recommendations. According to the system evaluators 83.6% of the users were satisfied with the prototype.

KEYWORDS

expert system, computer troubleshooting, self learning, knowledge based system

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INTELLIGENT DECISION SUPPORT SYSTEMS FOR ADMISSION MANAGEMENT IN HIGHER EDUCATION INSTITUTES

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ABSTRACT

On the basis of their use, the DSS has received positive feedback from the University's decision makers. Making use of Intelligent Decision Support Systems (IDSS) technologies suited to provide decision support in the higher education environments, by generating and presenting relevant information and knowledge which are helpful in taking the decision regarding admission management in higher education colleges or universities. The university decision makers' needs and the DSS components are identified with the help of survey done. In this paper the components of a decision support system (DSS) for developing student admission policies in higher education institute or in the university and the architecture about DSS based on ERP are proposed followed by how intelligent DSS in conjunction with ERP helps to overcome the drawbacks , if ERP is used alone in higher education institutes.

KEYWORDS

Intelligent systems, Decision support, Decision Support Systems (DSS), ERP, Higher education institutions, knowledge base.

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IMPROVING THE COMMUNICATION FOR CHILDREN WITH SPEECH DISORDERS USING THE SMART TOYS

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ABSTRACT

An attempt is made to develop a smart toy to help the children suffering with communication disorders. The children suffering with such disorders need additional attention and guidance to understand different types of social events and life activities. Various issues and features of the children with speech disorders are identified in this study and based on the inputs from the study, a working architecture is proposed with suitable policies. A prediction module with a checker component is designed in this work to produce alerts in at the time of abnormal behaviour of the child with communication disorder. The model is designed very sensitively to the behaviour of the child for a particular voice tone, based on which the smart toy will change to tones automatically. Such an arrangement proved to be helpful for the children to improve the communication with other due to the inclusion of continuous training for the smart toy from the prediction module.

KEYWORDS

Speech Disorders, Improving Communication, Smart Toy, Runtime Checker, Prediction Module, Tracking

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SUPERVISED LEARNING METHODS FOR BANGLA WEB DOCUMENT CATEGORIZATION

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ABSTRACT

This paper explores the use of machine learning approaches, or more specifically, four supervised learning Methods, namely Decision Tree(C 4.5), K-Nearest Neighbour (KNN), Naïve Bays (NB), and Support Vector Machine (SVM) for categorization of Bangla web documents. This is a task of automatically sorting a set of documents into categories from a predefined set. Whereas a wide range of methods have been applied to English text categorization, relatively few studies have been conducted on Bangla language text categorization. Hence, we attempt to analyze the efficiency of those four methods for categorization of Bangla documents. In order to validate, Bangla corpus from various websites has been developed and used as examples for the experiment. For Bangla, empirical results support that all four methods produce satisfactory performance with SVM attaining good result in terms of high dimensional and relatively noisy document feature vectors.

KEYWORDS

Bangla articles corpus, Machine learning, Supervised learning, Text categorization

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Volume Link: **http://airccse.org/journal/ijaia/current2014.html**

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