Abstracts

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Editor in Chief: Bogdan Pătruţ

1. Brain Functors: A Mathematical Model Of Intentional Perception And Action

David Ellerman

Abstract

Category theory has foundational importance because it provides conceptual lenses to characterize what is important and universal in mathematics - with adjunctions being the primary lens. If adjunctions are so important in mathematics, then perhaps they will isolate concepts of some importance in the empirical sciences. But the applications of adjunctions have been hampered by an overly restrictive formulation that avoids heteromorphisms or hets. By reformulating an adjunction using hets, it is split into two parts, a left and a right semiadjunction. Semiadjunctions (essentially a formulation of universal mapping properties using hets) can then be combined in a new way to define the notion of a brain functor that provides an abstract model of the intentionality of perception and action (as opposed to the passive reception of sense-data or the reflex generation of behavior).

2. Intelligent System for Diagnosis of a Three-Phase Separator

Irina Ioniţă, Liviu Ioniţă

Abstract

Intelligent systems for diagnosis have been used in a variety of domains: financial evaluation, credit scoring problem, identification of software and hardware problems of mechanical and electronic equipment, medical diagnosis, fault detection in gas-oil production plants etc. The goal of diagnosis systems is to classify the observed symptoms as being caused by some diagnosis class while advising systems perform such a classification and offer corrective remedies (recommendations). The current paper discuss the opportunity to combine more intelligent techniques and methodologies (intelligent agents, data mining and expert systems) to increase the accuracy of results obtained from the diagnosis of a three-phase separator. The results indicate that the diagnosis hybrid system benefits from the advantages of each module component: intelligent agent module, data mining module and expert system module.

3. Single Trial Classification of Evoked EEG Signals due To RGB Colors

Eman Alharbi, Saim Rasheed, Seyed Buhari

Abstract

Recently, the impact of colors on the brain signals has become one of the leading researches in BCI systems. These researches are based on studying the brain behavior after color stimulus, and finding a way to classify its signals offline without considering the real time. Moving to the next step, we present a real time classification model (online) for EEG signals evoked by RGB colors stimuli, which is not presented in previous studies. In this research, EEG signals were recorded from 7 subjects through BCI2000 toolbox. The Empirical Mode Decomposition (EMD) technique was used at the signal analysis stage. Various feature extraction methods were investigated to find the best and reliable set, including Event-related spectral perturbations (ERSP), Target mean with Feast

Fourier Transform (FFT), Wavelet Packet Decomposition (WPD), Auto Regressive model (AR) and EMD residual. A new feature selection method was created based on the peak's time of EEG signal when red and blue colors stimuli are presented. The ERP image was used to find out the peak's time, which was around 300 ms for the red color and around 450 ms for the blue color. The classification was performed using the Support Vector Machine (SVM) classifier, LIBSVM toolbox being used for that purpose. The EMD residual was found to be the most reliable method that gives the highest classification accuracy with an average of 88.5% and with an execution time of only 14 seconds.

4. Computer-Mediated Security Threats into the Web 2.0 Society

Bogdan Nadolu, Delia Nadolu

Abstract

This paper is focused on a contemporary very complex and controversial issue related to the ICT using: should the Internet be censured, or not? The promise of the 4 of A – Anyone to be able to send Anything, Anywhere, Anytime is almost achieved. Into the digital universe we can find plenty of useful information for positive or negative actions. The global info-sphere has developed a distinct chapter of dark and deep web, where the tracking of information and users is blocked, and thus contents over the laws limits can be easily accessed.

5. Modeling, Designing, and Implementing an Avatar-Based Interactive Map

Stefan Andrei, Milin Joshi, Chandrakant Rudani, Ankur Shah, Bharatkumar Tejwani

Abstract

Designing interactive maps has always been a challenge due to the geographical complexity of the earth's landscape and the difficulty of resolving details to a high resolution. In the past decade or so, one of the most impressive map-based software application, the Global Positioning System (GPS), has probably the highest level of interaction with the user. This article describes an innovative technique for designing an avatar-based virtual interactive map for the Lamar University Campus, which will entail the buildings' exterior as well as their interiors. Many universities provide 2D or 3D maps and even interactive maps. However, these maps do not provide a complete interaction with the user. To the best of our knowledge, this project is the first avatar-based interaction game that allows 100% interaction with the user. This work provides tremendous help to the freshman students and visitors of Lamar University. As an important marketing tool, the main objective is to get better visibility of the campus worldwide and to increase the number of students attending Lamar University.

6. Modern Tools in Patient-Centred Speech Therapy for Romanian Language

Mirela Danubianu, Iolanda Tobolcea

Abstract

The most common way to communicate with those around us is speech. Suffering from a speech disorder can have negative social effects: from leaving the individuals with low confidence and moral to problems with social interaction and the ability to live independently like adults. The speech therapy intervention is a complex process having particular objectives such as: discovery and identification of speech disorder and directing the therapy to correction, recovery, compensation, adaptation and social integration of patients. Computer-based Speech Therapy systems are a real help for therapists by creating a special learning environment. The Romanian language is a phonetic one, with special linguistic particularities. This paper aims to present a few computer-based speech therapy systems developed for the treatment of various speech disorders specific to Romanian language.

7. Measuring Customer Behavior with Deep Convolutional Neural Networks

Veaceslav Albu

Abstract

In this paper, we propose a neural network model for human emotion and gesture classification. We demonstrate that the proposed architecture represents an effective tool for real-time processing of customer's behavior for distributed on-land systems, such as information kiosks, automated cashiers and ATMs. The proposed approach combines most recent biometric techniques with the neural network approach for real-time emotion and behavioral analysis. In the series of experiments, emotions of human subjects were recorded, recognized, and analyzed to give statistical feedback of the overall emotions of a number of targets within a certain time frame. The result of the study allows automatic tracking of user's behavior based on a limited set of observations.

8. Cognitive Development Optimization Algorithm Based Support Vector Machines for Determining Diabetes

Utku Kose, Gur Emre Guraksin, Omer Deperlioglu

Abstract

The definition, diagnosis and classification of Diabetes Mellitus and its complications are very important. First of all, the World Health Organization (WHO) and other societies, as well as scientists have done lots of studies regarding this subject. One of the most important research interests of this subject is the computer supported decision systems for diagnosing diabetes. In such systems, Artificial Intelligence techniques are often used for several disease diagnostics to streamline the diagnostic process in daily routine and avoid misdiagnosis. In this study, a diabetes diagnosis system, which is formed via both Support Vector Machines (SVM) and Cognitive Development Optimization Algorithm (CoDOA) has been proposed. Along the training of SVM, CoDOA was used for determining the sigma parameter of the Gauss (RBF) kernel function, and eventually, a classification process was made over the diabetes data set, which is related to Pima Indians. The proposed approach offers an alternative solution to the field of Artificial Intelligence-based diabetes diagnosis, and contributes to the related literature on diagnosis processes.

9. The Fundamentals Regarding the Usage of the Concept of Interface for the Modeling of the Software Artefacts

Dorin Bocu, Razvan Bocu

Abstract

This paper presents the conceptual foundations of a software system's solution modelling activity, which is formally based on two essential concepts: the artefact and the interface. This modelling activity envisions two objectives: the explicit emphasis on the interfaces' importance in the software engineering, and the preparation of the framework inside which the loop structure-behaviour can be formalized considering the inherent benefits for the modelling activity in general, and for the modelling activity automation in particular.

10. Micro Learning: A Modernized Education System

Omer Jomah, Amamer Khalil Masoud, Xavier Patrick Kishore, Sagaya Aurelia

Abstract

Learning is an understanding of how the human brain is wired to learning rather than to an approach or a system. It is one of the best and most frequent approaches for the 21st century learners. Micro learning is more interesting due to its way of teaching and learning the content in a small, very specific burst. Here the learners decide what and when to learn. Content, time, curriculum, form, process, mediality, and learning type are the dimensions of micro learning. Our paper will discuss about micro learning and about the micro-content management system. The study will reflect the

views of different users, and will analyze the collected data. Finally, it will be concluded with its pros and cons.

11. Romanian Campaigns on Corporate Social Responsibility – Signs of Globalization

Monica Patrut, Camelia Cmeciu

Abstract

Organizations play an important role in the development of the modern society since managers have become aware that financial profit highly depends on community involvement. The active participation of organizations in community life implies to adapt global strategies to local issues or to promote local issues at a global level. Actually this is the essence of glocalization. The means by which organizations can achieve these glocal objectives is CSR campaigns. CSR represents an instrument used to solve diverse issues, such as: human rights, environment and climate change, education, support for vulnerable groups, sustainable development, or establishment of moral capitalism. Within the context of the ever-rising internet access of all audiences, CSR campaigns have become more visible and have capitalized on the advantages of collective intelligence, internet users' participation and their user generated contents. The purpose of our study is to provide an insight into (1) the prominence of Romanian organizations which are the most socially responsible, (2) the domains in which Romanian organizations have invested; (3) the salience of CSR 1.0 and CSR 2.0 tools used in the promotion of CSR campaigns in Romania.

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For questions concerning manuscript submission, contact Mr. **Bogdan Patrut** by mail at **bogdan@edusoft.ro**.

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