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- ABSTRACTS -

Foreword

Welcome to the Journal of Information Systems & Operations Management (ISSN 1843-4711; IDB indexation: ProQuest, REPEC, QBE, EBSCO, COPERNICUS). This journal is an open access journal published two times a year by the Romanian-American University.

The published articles focus on IT&C and belong to national and international researchers, professors who want to share their results of research, to share ideas, to speak about their expertise and Ph.D. students who want to improve their knowledge, to present their emerging doctoral research.

Being a challenging and a favorable medium for scientific discussions, all the issues of the journal contain articles dealing with current issues from *computer science*, *economics*, *management*, *IT&C*, etc. Furthermore, JISOM encourages the cross-disciplinary research of national and international researchers and welcomes the contributions which give a special "touch and flavor" to the mentioned fields. Each article undergoes a double-blind review from an internationally and nationally recognized pool of reviewers.

JISOM thanks all the authors who contributed to this journal by submitting their work to be published, and also thanks to all reviewers who helped and spared their valuable time in reviewing and evaluating the manuscripts.

Last but not least, JISOM aims at being one of the distinguished journals in the mentioned fields.

Looking forward to receiving your contributions,

Best Wishes

Virgil Chichernea, Ph.D.

Editor-in-Chief

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Editorial

TEMPORAL DATA MANAGEMENT IN NOSQL DATABASES

Morgan D. Monger[1]
Ramon A. Mata-Toledo[2]
Pranshu Gupta[3]

ABSTRACT

Temporal data management is recognized concept of managing data that changes over time. Traditionally, a temporal data management system (TDMS) was considered separate system, i.e. an extension of the traditional relational database management system (RDBMS). Recently a non-relational database, called NoSQL, has become quite popular for scalability and storage of big data. Even with this new approach for managing data, temporal data management is still a work in progress. This paper provides an overview of temporal data management and NoSQL databases. Also, temporal data management is discussed within the context of NoSQL databases. This paper concludes with observations and suggestions for future research.

Keywords: temporal database, NoSQL, database, big data, bi-temporal data

A PAKE – SRP6 BROWSER EXTENSION

Alexandru Gavril Bardas[4]

ABSTRACT

The username/password paradigm is a well-known authentication mechanism. Probably the most common version in use is the password authentication via an HTML form. The user has to type his/her password directly into a web page from the site to which he/she wishes to authenticate himself/herself. The problem with using this approach is that it relies on the user to determine when it is safe to enter his/her password. If the user authenticates himself/herself to a phishing website by disclosing his/her password, the password is stolen even though the session is fully encrypted. In other words in traditional password authentication, passwords are used only for client-side authentication. Password-authenticated key exchange (PAKE) on the other hand, offers password-based mutual authentication. This mutual authentication is different because its client-side authentication cannot be separated from its server-side authentication part.

This paper shows that PAKE can represent a practical alternative approach to protect passwords without relying on a Public Key Infrastructure (PKI). Therefore, the goal of this work was to study how to integrate PAKE into web applications, not to develop a

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standalone PAKE implementation. We analyzed the PAKE client-side implementation within a web browser and tested it with a server-side implementation on a web server. The developed extension is a Mozilla Firefox web browser extension. The implementation is just a proof of concept that shows that a password authenticated key exchange can be done over HTTP and can be used against phishing attacks.

TECHNIQUES FOR OPTIMIZING THE RELATIONSHIP BETWEEN DATA STORAGE SPACE AND DATA RETRIEVAL TIME FOR LARGE DATABASES

Virgil Chichernea[5]
Dragos-Paul Pop[6]

ABSTRACT

There are large amounts of data generated in the information society every day; this data comes from various sources, like measuring devices, public administration, mass media, telephony, GPS, the movie industry, television stations, etc. Gartner, the author of the "hype cycle" concept, defines the "BIG Data" (BIGD) concept as "high volume, velocity and/or variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation". It is the single most hyped term in the market today. BIGD has drawn the attention of the IT and marketing research communities, with concrete results about "BIGD solutions" and significant resources being allocated for "BIGD projects". The objective of the hype cycle for BIGD is to help the decision makers to work with this concept in order to develop future activities in the context of the fundamental change of the cost-benefit equation terms. Optimizing the relationship between storage space and retrieval time for data stored as BIGD is a major challenge for research in the field.

This paper shows techniques for data structuring in BIGD, techniques that optimize the relationship between storage space and retrieval time under the aspect of total cost, techniques based on Boolean algebra and atom files.

Keywords: Big Data, Hype Cycle, Volume, Velocity, Variety, and Veracity, Boolean algebra, Atoms File

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POSSIBILITIES OF MODELING COMPETITIVENESS INDICES RELEVANCY

Cristina Coculescu[7]

ABSTRACT

Measurement of competitiveness is – even in a well-defined conceptual frame – more a compromise between available data and the big number of different criteria and objectives. Additionally, in the building of competitiveness indices, many technical problems occur that have not always a unique not ambiguous solution, even theoretically. For measurement information relevancy of competitiveness indices, in this work we purpose an original econometric model relied on subtle sets. After a short qualitative and quantitative study of information relevancy, it was showed that there is a synergy of information relevancy of economic concepts and, therefore, this is applied also over the concept of competitiveness. Basic idea of purposed model was that the variables (determinants) of competitiveness indices could be the pieces of a subtle set. The program realized for implementation of purposed model accompanied by a database having necessary variables for competitiveness indices, showed that information relevancy is useful in management decisions and can be a real working instrument.

Keywords: competitiveness, information relevancy, synergy, economic concepts.

ANTICIPATORY VERSUS TRADITIONAL GENETIC ALGORITHM

Irina Mocanu[8]
Eugenia Kalisz[9]

ABSTRACT

This paper evaluates the performances of a new type of genetic algorithms - anticipatory genetic algorithms (AGA) versus traditional genetic algorithms (GA). The performances are evaluated based on two simple problems using different genetic operators. The evaluation included in the paper shows that AGA is superior to traditional genetic algorithm from both speed and accuracy points of view. Then we evaluate the two types of genetic algorithms for solving the problem of image annotation, which will be used in content based image retrieval systems. In this case the AGA performances are superior to GA, too.

Keywords: genetic algorithm, anticipation, image annotation, performance evaluation.

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DECISION-MAKING FACTORS IN THE PROCESS OF MODELING ONLINE BUSINESS

Cezar Mihãlcescu[10]
Beatrice Sion[11]
Alexandra Mãrginean[12]

ABSTRACT

Models are "abstract structures that help us understand the real world when the situations we are in are too complicated, too dangerous or take up too much time or money to be examined directly. Models simplify things, leaving aside unessential or minor elements." [13]

In order to assign the term model to classes that are as precise as necessary, we need to leave out all irrelevant information, in order to simplify it as much as possible.

Keywords: modeling, business, Internet, decision

E-LEARNING IN EUROPEAN HIGHER EDUCATION

Maria-Lavinia Popescu[14]

ABSTRACT

E-learning has been enrolled as one of the main subjects in the agenda of the European and national institutions in the last years. This initiative tries to mobilize all the actors to hasten the changes from the education and training systems so that the European Union should advance towards a knowledge-based society. In this sense the present paper offers moment "photography" of manner in which the students valuate the e-learning system in two universities which belong to different cultures: Romania and France.

Keywords: e-learning, student, higher education, France, Romania

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THE CORRESPONDENCE ANALYSIS APPLIED ON THE AGRICULTURE SECTOR OF EUROPEAN UNION COUNTRIES USING STATISTICAL ANALYSIS SYSTEM

Ana-Maria Mihaela Iordache[15]
Mihai-Tiberiu Iordache[16]
Ionela-Cătălina Tudorache[17]

ABSTRACT

The main goal of analysis is represented by studying the simultaneous correspondences of lines and columns of a contingency table in order to highlight the connections and the correspondences between the sets of variables. There are two basic ways to achieve the correspondence analysis. First is the analysis of relationships between the two variables whose observation we find a contingency table and the second is the analysis of relationships between a set of variables (types of responses of subjects) and another group of qualitative variables with more ways to respond. In our analysis we use eight variables from agriculture measured on European Union countries, then we applied correspondence analysis on the data set and we showed how the countries group by the quantities of information brought by each indicator.

Keywords: correspondence analysis, inertia, mass, cluster analysis

HUMAN INTERACTION WITH MOBILE APPLICATIONS

Alin Zamfiroiu[18]
Emanuel Herteliu[19]
Bogdan Vintila[20]

ABSTRACT

Computing - human interaction is a very important paradigm because informatics applications are created to be used by people via human interaction. Nowadays mobile applications are more used so is necessarily to talk about mobile - human interaction. In this paper types of mobile devices are presented. Citizen oriented character of mobile application and his utility are described. Different means of interactions with mobile devices are analyzed and in the end of the paper direction of mobile applications development and mobile gesture recognition are presented.

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CYBERCRIME OFFENCES. TRENDS IN OF THE EVOLUTION, FORMS OF MANIFESTATION AND INCRIMINATION OF THIS PHENOMENON

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ABSTRACT

This study refers to the evolution and forms of manifestation of cybercrime offences, as well as the efforts of the law giver and organisms of law enforcement to prevent and fight this phenomenon.

Keywords: cybercrime offences, evolution, forms of manifestation, incrimination.

SOLUTIONS FOR OPTIMIZING THE RADIX SORT ALGORITHMIC FUNCTION USING THE COMPUTE UNIFIED DEVICE ARCHITECTURE

Alexandru Pîrjan[23]
Dana-Mihaela Petroşanu[24]

ABSTRACT

In this paper, we have researched and developed solutions for optimizing the radix sort algorithmic function using the Compute Unified Device Architecture (CUDA). The radix sort is a common parallel primitive, an essential building block for many data processing algorithms, whose optimization improves the performance of a wide class of parallel algorithms useful in data processing. A particular interest in our research was to develop solutions for optimizing the radix sort algorithmic function that offers optimal solutions over an entire range of CUDA enabled GPUs: Tesla GT200, Fermi GF100 and the latest Kepler GK104 architecture, released on March 2012. In order to confirm the utility of the developed optimization solutions, we have extensively benchmarked and evaluated the performance of the radix sort algorithmic function in CUDA.

Keywords: parallel processing, CUDA, GK104, threads, shared memory.

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NUMERICAL METHODS FOR SOLVING SDES CASE STUDY

Ovidiu Solomon[25]

ABSTRACT

The Euler - Maruyama and Milstein methods are applied to approximate the solution of linearly Langevin equation with multiplicative noise. The exact solution is obtained by applying the Ito's lemma. It is worth mentioning that not always the discretization used to find the solutions of SDEs (Stochastic Differential Equations) leads to a convenient convergence when the discretization step tends to zero.

Keywords: stochastic differential equation, numerical methods, Langevin equation, multiplicative noise

THE IMPACT OF THE INFORMATION TECHNOLOGY ON THE E.U LINGUISTIC SECTOR

Mariana Coancă[26]

ABSTRACT

E.U is currently facing new challenges in the sense that linguists, translators, terminologists cooperate tightly in order to achieve the major goal of the E.U concerning the linguistic sector: the promotion of multilingualism by using the correct terminology. In this paper I focused on the peculiarities of the linguistic sector, and on the dimension of the linguistic industry. Moreover, I made a brief description of the translation process (I outlined some aspects related to translation of labels) in the E.U and I presented a few translation tools including TRADOS which is considered one of the most reliable translation tools. Some companies offered their full support to improve the linguistic sector, that is why the impact of the information technology is obvious because many programs were created to ease the translators' work

Keywords: European Union, linguistic sector, information technology, translation, translators, labels

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MAINTENANCE PROCESSES EVALUATION FOR DISTRIBUTED APPLICATIONS

Gabriel Eugen Garais[27]

ABSTRACT

Maintenance processes are part of the life cycle of distributed applications, making it necessary to ensure their easy assistance after deployment of the application currently in use. On the basis of the recorded action is taken to assess the maintenance process and maintenance process as a whole. Record number of maintenance processes in the application management provides a basis for determining statistical study of the distribution and consumption of resources on the types of maintenance categories.

Key words: maintenance; maintainability; life span of the maintenance processes; distributed applications; collaborative systems; databases; GUI; html structures; maintenance processes; maintenance metrics; evaluation of maintenance processes.

THE ADVANTAGES AND THE DISADVANTAGES OF E-LEARNING IN EUROPEAN UNION

Ionela-Catalina Tudorache[28]
Ana-Maria Mihaela Iordache[29]
Mihai-Tiberiu Iordache[30]

ABSTRACT

By 2006, nearly 3.5 million students were participating in on-line learning at institutions of higher education in United States. Many higher education and for-profit institutions, now offer on-line classes. By contrast, only about half of private, non-profit schools offer them. The Sloan report, based on a poll of academic leaders, says that students generally appear to be at least as satisfied with their on-line classes as they are with traditional ones. In the article we talk about the impact of the introduction of e-learning methods on the education system in Romania, correlated with other programs already implemented at European level.

Keywords: e-learning, classic learning, statistics for Romania

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APPLYING PUZZLE ENCRYPTION IN THE ON-DEMAND ROUTING PROTOCOLS IN MOBILE AD HOC NETWORKS (MANETS)

Ahmad Alomari[31]

ABSTRACT.

Recently, the use of Mobile Ad Hoc Networks (MANETs) systems in our life has rapidly increased. Nevertheless, we need for this efficiency and privacy routing protocols to exchange the information between the nodes in this kind of networks. We propose a new scheme to apply it on the On-Demand routing because it is one of the most popular and usable in the MANETs. The main goal in our paper is to promote and improve the authentication between the nodes in the MANETs by applying the puzzle encryption before they start exchange the data packet between them. The new scheme is based on combined use of cryptographic puzzles and weakly secret bit commitment (WSBC) function. The scheme has to offer privacy protection of the confidential information stored in the nodes, that is identifier ID and encryption puzzle. The identifier allows the unequivocal identification of the nodes on the mobile networks. The anonymity of messages is crucial to avoid traceability and replay attacks and denial services. The puzzles function use one way encryption functions whereas the keys must be enough to avoid a brute force attack. We use also the bit commitment function with puzzle encryption in our scheme to commit a value without revealing that value. This scheme will offer moderate protection concerning privacy and traceability when a node communicates with each other in the Mobile Ad hoc Networks (MANETs).

Keywords: MANET, AODV, RSA, puzzle function, WSBC.

ELECTRONIC ONLINE ADVERTISING – THE "ECONOMIC CRISIS" IS JUST THE PRETEXT OF THE FALL

Alexandru Tăbușcă[32]

ABSTRACT

The paper aims to present the actual online advertising environment during the world economic crisis, focused on some similarities with the spam concept used for the unwanted email messages. The vast majority of today online advertisements, as well as most TV advertisements too, are completely disregarded and even seen as intrusive and

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offensive by many people. Even though the trend has increased towards online advertising instead of classic TV and radio ads, the online environment is now facing the same decline in meaningfulness as any other media driven advertising.

Keywords: advertisements, online ads, spam, internet, crisis, algorithms, consumer, trends

THE IMAGE BINARIZATION PROBLEM REVISITED: PERSPECTIVES AND APPROACHES

Costin-Anton Boiangiu[33]
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Andrei Tigora[35]

ABSTRACT

Image document analysis is a complex process that involves several steps of processing. However, due to their sensitivity to errors, most of these are not applied on the original image; instead, they use a simplified black and white version of the original image, which offers a clear separation between foreground and background. Unfortunately, achieving the optimal separation is difficult to achieve, as no proposed algorithm has managed to offer a solution that is adequate for any type of input. This paper aims to present some of the more recent approaches in the field and compare their results with some of the classic algorithms.

Keywords: Binarization, Local Thresholding, Global Thresholding, Variable Window, Niblack, Otsu

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BUILDING NON-OVERLAPPING POLYGONS FOR IMAGE DOCUMENT LAYOUT ANALYSIS RESULTS

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ABSTRACT

Existing Computational Geometry algorithms aren't able to create a tight-fitting contour around document elements. Some of them don't follow the data points close enough, generating overlapping elements, while others, trying to keep close to the contour, break one element into pieces, falling between white spaces. The presented method both follows the contour closely and generates a single shape for a single element. The generation of the shape can be stopped at any time, either when there are no more intersections between layout elements or after a certain time elapsed, the result being valid at any given moment. In association with other algorithms it can offer a fast and clean solution for the problem of finding the non-overlapping areas resulted from the Layout Analysis document processing phase.

Keywords: layout analysis, alpha shape, bounding volumes, contour retrieval, automatic content conversion, scanned images

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