

2014

Information Technology & Computer Science Abstracts

10th Annual International
Conference on Information
Technology & Computer Science,
19-22 May 2014, Athens, Greece
Edited by Gregory T. Papanikos

THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH



Information Technology &
Computer Science Abstracts

10th Annual International
Conference on Information
Technology & Computer
Science, 19-22 May 2014,
Athens, Greece

Edited by Gregory T. Papanikos

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Preface

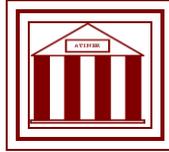
This abstract book includes all the summaries of the papers presented at the 10th Annual International Conference on Information Technology & Computer Science, 19-22 May 2014, Athens, Greece, organized by the Computer Research Unit of the Athens Institute for Education and Research. In total there were 30 papers, coming from 21 different countries (Albania, Australia, Bosnia & Herzegovina, Bulgaria, China, Germany, Iraq, Italy, Jordan, Korea, Malaysia, Morocco, Poland, Romania, Russia, Saudi Arabia, Sweden, Turkey, UAE, UK, USA). The conference was organized into 7 sessions that included areas of Internet, Telecommunications, Education and other relative disciplines. As it is the publication policy of the Institute, the papers presented in this conference will be considered for publication in one of the books of ATINER.

The Institute was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet in Athens and exchange ideas on their research and consider the future developments of their fields of study. Our mission is to make ATHENS a place where academics and researchers from all over the world meet to discuss the developments of their discipline and present their work. To serve this purpose, conferences are organized along the lines of well established and well defined scientific disciplines. In addition, interdisciplinary conferences are also organized because they serve the mission statement of the Institute. Since 1995, ATINER has organized more than 150 international conferences and has published over 100 books. Academically, the Institute is organized into four research divisions and nineteen research units. Each research unit organizes at least one annual conference and undertakes various small and large research projects.

I would like to thank all the participants, the members of the organizing and academic committee and most importantly the administration staff of ATINER for putting this conference together.

Gregory T. Papanikos
President

Athens Institute for Education and Research
Human Development Research Division
Research Unit of Health



C O N F E R E N C E P R O G R A M
(The time for each session includes at least 10 minutes coffee break)
Organization and Scientific Committee

1. Dr. Gregory T. Papanikos, President, ATINER.
2. Dr. Panagiotis Petratos, Vice-President of ICT, ATINER & Associate Professor of Computer Information Systems, California State University, Stanislaus, USA.
3. Dr. George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.
4. Dr. Nicholas Pappas, Vice-President of Academic Affairs, ATINER & Professor, Sam Houston University, USA.
5. Dr. Constantine Georgakis, Associate Professor, DePaul University, USA.
6. Dr. Dominique Haughton, Professor, Bentley University and Toulouse School of Economics, USA.
7. Mr Stephen James Hole, Senior Lecturer, Swansea Institute of Higher Education, U.K.
8. Dr. Fotis Liarokapis, Senior Lecturer, Coventry University, U.K.
9. Dr. Ronald Lodewyck, Professor of Computer Information Systems, California State University, Stanislaus, USA.
10. Dr. Barbara Nicolai, Professor, Purdue University, USA.
11. Dr. Vasos Pavlika, Senior lecturer Software Engineering, University of Westminster, U.K.
12. Dr. Abdel-Badeeh Salem, Professor, Ain Shams University, Egypt.
13. Dr. Stilianos Vidalis, Senior Lecturer, University of Wales, Newport, U.K.
14. Mr. Vasilis Charalampopoulos, Researcher, ATINER & Ph.D. Student, University of Stirling, U.K.
15. Ms. Effie Stamoulara, Researcher, ATINER.

Administration

Fani Balaska, Stavroula Kiritsi, Konstantinos Manolidis, Katerina Maraki, Celia Sakka,
Konstantinos Spiropoulos & Ioanna Trafali

Monday 19 May 2014

09:00-09:30 Registration

09:30-10:00 Welcome and Opening Remarks

- Dr. Gregory T. Papanikos, President, ATINER.
- Dr. Panagiotis Petratos, Vice-President of ICT, ATINER & Associate Professor of Computer Information Systems, California State University, Stanislaus, USA.

10:00-11:30 Session I (Room E): Cloud Computing, Internet & Telecommunications

I

Chair: Panos Petratos, Vice-President ICT, ATINER & Associate Professor of Computer Information Systems, California State University, Stanislaus, USA.

1. *Till Hanisch, Professor, Baden Wuerttemberg Cooperative State University, Germany. Using a Sensor Network for Energy Optimization of Paper Machine Dryer Sections.
2. Vimala Balakrishnan, Lecturer, University of Malaya, Malaysia & Zhang Xinyue, Lecturer, University of Malaya, Malaysia. Using Text Highlight and Page Re-views to Improve Search Engine Result Page.
3. Eugenia Georgiades, PhD Student, Griffith University, Australia. The Legal Protection of the Use of Images within Social Networks in an Australian Context.
4. Dejiu Chen, Associate Professor, Royal Institute of Technology, Sweden. Enhancing the EAST-ADL Error Model with HiP-HOPS Semantics. (Monday 19 of May, morning).
5. Saad Al-Janabi, Professor, Al-Turath College University, Iraq & Angham K., Professor, Al-Turath College University, Iraq. Hybric Public - Key System.

11:30 -13:00 Session II (Room E): Scientific Computing I

Chair: Dejiu Chen, Associate Professor, Royal Institute of Technology, Sweden.

1. Irena Pevac, Professor, Central Connecticut State University, USA. TIARA Tutor for Time Efficiency Analysis of Recursive Algorithms.
2. Dimitri Kagaris, Professor, Southern Illinois University, USA & Mario Rene, Master Student, Southern Illinois University, USA. Extensions to Shortest Job First Scheduling for Tasks of Mixed Criticality.
3. Blerina Zanaj, Lecturer, Metropolitan Tirana University, Albania, Elma Zanaj, Lecturer, Polytecnic University of Tirana, Albania, Mirjeta Alinci, Lecturer, Polytecnic University of Tirana, Albania & Ezmerina Kotobelli, Lecturer, Polytecnic University of Tirana, Albania. Efficiency Measurement of Epidemic Algorithms. (Monday 19 of May)
4. Xiaomeng Feng, The Academy of Equipment, China, Ronghuan Yu, The Academy of Equipment, China, Bo Li, The Academy of Equipment, China. Real-time Rendering and Updating Method for Electromagnetic Environment Based on CUDA.
5. SangWon Kim, Graduate Student, Sungkyunkwan University, Korea. Image Based Human Behavior Recognition.

13:00-14:00 Lunch

14:00-15:30 Session III (Room E): Cloud Computing, Internet & Telecommunications II

Chair: Till Hanisch, Professor, Baden Wuerttemberg Cooperative State University, Germany.

1. *Adnane Latif, Professor, Cadi Ayyad University, Morocco. Modeling of Geo-Location by Wireless Communications WLANs: WiFi.
2. Marcin Klauza, Student, Silesian University of Technology, Poland, Piotr Czekalski, Lecturer, Silesian University of Technology, Poland & Krzysztof Tokarz, Lecturer, Silesian University of Technology, Poland. Air Traffic Data Integration Using Semantic Web Approach.
3. Mihail Mateev, Assistant Professor, UACEG Sofia, Bulgaria. Testing Cloud Based Applications.

15:30-17:00 Session IV (Room E): Cloud Computing, Internet & Telecommunications III

Chair: Adnane Latif, Professor, Cadi Ayyad University, Morocco.

1. Amiral Youssef, Head, Registry Department, University Diabetes Center, King Saud University, Saudi Arabia, Khalid Al-Rubeaan, Director, King Saud University, Saudi Arabia, Shazia Subhani, Head, King Faisal Specialist Hospital and Research Centre, Saudi Arabia, Najlaa Ahmad, Research Physician, King Saud University, Saudi Arabia, Ahmad Al-Sharqawi, Biostatistician, King Saud University, Saudi Arabia & Heba Ibrahim, Supervisor, King Saud University, Saudi Arabia. A Web-Based Interactive Diabetes Registry for Health Care Management and Planning in Saudi Arabia.
2. Ayse Yurdakul, Research Assistant, Braunschweig University of Technology, Germany, Eckehard Schnieder, Director, Institute for Traffic Safety and Automation Engineering, Germany. Modeling Process of Traffic Safety Terminology with the Igloos Software.
3. Vladimir Vujovic, Teaching Assistant, University of East Sarajevo, Bosnia and Herzegovina, Mirjana Maksimovic, Teaching Assistant, , University of East Sarajevo, Bosnia and Herzegovina & Branko Perisic, Associate Professor, University of Novi Sad, Serbia. A DSM for a Modeling Restful Sensorweb Network.
4. Taner Soner, Researcher, Turkish Military Academy Defense Sciences Institute, Turkey & Asim Egemen Yilmaz, Associate Professor, Ankara University, Turkey. Development of a Software Package for Application of Parametric Estimation Models to Software Projects.

21:00-23:00 Greek Night and Dinner (Details during registration)

Tuesday 20 May 2014

09:00-10:30 Session V (Room E): Cloud Computing, Internet & Telecommunications IV

Chair: Kwei-Jay Lin, Professor, University of California, USA.

1. *Erind Bedalli, Lecturer, University of Elbasan, Albania & Ilia Ninka, Lecturer, University of Tirana, Albania. Exploring an Educational System's Data through Fuzzy Cluster Analysis.
2. Jeongsook Park, Principal Researcher, ETRI, Republic of Korea, Chei-Yol Kim, Senior Researcher, ETRI, Republic of Korea, Youngchang Kim, Senior Researcher, ETRI, Republic of Korea, Youngchul Kim, Senior Researcher, ETRI, Republic of Korea, Sangmin Lee, Principal Researcher, ETRI, Republic of Korea & Young-Kyun Kim, Principal Researcher, ETRI, Republic of Korea. Performance Evaluation of a Distributed File System for VDI Services.
3. Muneer Bani Yassein, Associate Professor, Jordan University, Jordan. Dynamic Distance-Based Broadcast Scheme for Mobile Ad Hoc Networks.
4. Gabriela Matusik, Student, Silesian University of Technology, Poland, Piotr Grzywocz, Student, Silesian University of Technology, Poland, Krzysztof Fujarewicz, Lecturer, Silesian University of Technology, Poland & Krzysztof Lakomic, Assistant, Silesian University of Technology, Poland. Parameter Estimation of Non-Linear Dynamical Models - A Web-Based Application.
5. Ferdynand Naczynski, Student, Silesian University of Technology, Poland, Lukasz Mietla, Graduated Student, Silesian University of Technology, Poland, Krzysztof Tokarz, Assistant Professor, Silesian University of Technology, Poland & Piotr Czekalski, Assistant Professor, Silesian University of Technology, Poland. Performance Evaluation of Wireless System Using ZigBee Protocol.

10:30-12:00 Session VI (Room E): Business, Education, Health and IT

Chair: *Erind Bedalli, Lecturer, University of Elbasan, Albania.

1. Kwei-Jay Lin, Professor, University of California, USA. The Design of Middleware Support for Service-Oriented Things.
2. Fabrizio Amarilli, Lecturer, Polytechnic Foundation of Milano, Italy. A Framework for Business-IT Alignment in Turbulent Environments.
3. Lamis Al-Qora'n, PhD Student, University of Hull, UK, Neil Gordon, Senior Lecturer, University of Hull, UK, Septavera Sharvia, Research Assistant, University of Hull, UK, Martin Walker, Lecturer, University of Hull, UK & Yiannis Papadopoulos, Professor, University of Hull, UK. A Technical Approach for Safety Analysis of Clinical Workflows. (Tuesday 20 of May).

12:00-13:00 Lunch

13:00-14:30 Session VII (Room E): Scientific Computing II

Chair: Fabrizio Amarilli, Lecturer, Polytechnic Foundation of Milano, Italy.

1. Ahmed Osman, Associate Professor, American University of Sharjah, United Arab Emirates, Abobakr Baobaid, Position Student, American University of Sharjah, United Arab Emirates, Ali Elnour, Student, American University of Sharjah, United Arab Emirates, Shuaib Fuad, Student, American University of Sharjah, United Arab Emirates & Abdulrahman Al Jasmi, Student, American University of Sharjah, United Arab Emirates. Digital Protection of Induction Motor.
2. Elena-Niculina Dragoi, Assistant Professor, "Gheorghe Asachi" Technical University of Iasi, Romania, Silvia Curteanu, Professor, "Gheorghe Asachi" Technical University of Iasi, Romania & Vlad Dafinescu, Researcher, University of Medicine and Pharmacy "Gr. T. Popa", Romania. Succinic Acid Separation Modelling Using a Hybrid Neural Network - Clonal Selection Algorithm.
3. Piotr Stoklosa, BSc. Student, Silesian University of Technology, Poland & Grzegorz Baron, Associate Professor, Silesian University of Technology, Poland. Quad-Copter Self-Positioning System for Precise Manoeuvring during Landing Procedure.
4. Igor Gurevich, Senior Researcher, HETNET Consulting Company, Russia. Information Estimate the Mass of Initial Heterogeneity of Universe.
5. Abdulaziz Alsadhan, Professor, King Saud University, Saudi Arabia & Mohd Mudasir Shafi Lone, Researcher, King Saud University, Saudi Arabia. A Study on Task Scheduling Algorithms in Grid Computing.

17:30-20:30 Urban Walk (Details during registration)

21:00- 22:00 Dinner (Details during registration)

Wednesday 21 May 2014

Cruise: (Details during registration)

Thursday 22 May 2014

Delphi Visit: (Details during registration)

Saad Al-Janabi

Professor, Al-Turath College University, Iraq
&

Angham K.

Professor, Al-Turath College University, Iraq

Hybric Public - Key System

Abdulaziz Alsadhan

Professor, King Saud University, Saudi Arabia
&

Mohd Mudasir Shafi Lone

Researcher, King Saud University, Saudi Arabia

A Study on Task Scheduling Algorithms in Grid Computing

Grid computing technology is a form of distributed computing which presents freedom for the users to connect various remotely distributed computer resources to work in tandem to achieve a common goal or to solve a particular problem. A grid computing network can be made from a diverse processor types and different computers resources like storage drives, printers, RAM etc. connected by a superfast network spread across the world. Grid computing uses resources from unrelated computers which can be geographically scattered to carry out a substantial task at higher computing level making all these distributed computer resources to perform at a super computing level. The main idea behind grid computing is use these geographically dispersed resources efficiently so as to minimize the computational cost and operational complexity of very large and complex problems. Scheduling the tasks efficiently plays a vital role in achieving the results in a grid computing environment. To carry out the task and achieve the goal of grid computing, it's extremely important to use an efficient scheduling algorithm. Reply time and waiting time are two important factors in grid computing and optimization of these factors depend on the type of scheduling algorithm used to carry out a particular task. Selecting a particular algorithm will determine the runtime of the operation and utilization of the resources in grid environment. This paper will first provide an overview of grid computing. Secondly, grid scheduling process will be discussed. Third, different grid scheduling algorithms will be discussed. Based on this comprehensive study of grid computing and scheduling algorithms, a conclusion and future course of study will be provided.

Fabrizio Amarilli

Lecturer, Fondazione Politecnico di Milano, Italy

A Framework for Business - IT Alignment in Turbulent Environments

The paper intends to give a contribution to the field of research of the business-IT alignment in enterprises, more specifically SMEs, operating in turbulent environments or in context where flexibility is crucial. The paper presents an operational framework aimed at matching business needs and flexibility needs and the capacity of the Enterprise Information System (IS) to support them. The framework was tested and proved to be a useful decision support instrument for SMES operating in changable competing environments.

Business-ICT alignment has been on top of priorities for researchers and IT managers in companies for over 20 years [Luftman et al., 2005]. Despite the number of models and methodologies which have been published by researchers and practitioners, the topic still deserves attention, for some main reasons: (i) with the exception of some studies, most analyses focus the attention on the alignment from a strategic perspective, addressing the process of guaranteeing business strategy and IT strategy matching, but lacking instruments and practical approaches to implement the alignment [Cataldo et al., 2012; Chan and Reich, 2007]; (ii) the validity of alignment of IT, resources and procedures, to business strategy is based on the assumed capacity of the company to foresee and determine the competitive environment, therefore underestimating the role of external and out of control factors and the related flexibility of Information Systems [Salah et al., 2008]; only recently the concepts of flexibility and resilience have appeared in the ICT domain [Faouzi, 2013]; (iii) some recent technological and social phenomena related to the use of technologies in companies (mobile, cloud and social use of technologies, to mention some) are generating completely new ways of using ICT and giving companies new opportunities to pursue the alignment, on the one hand, and new degrees of flexibility, on the other.

The framework presented in the paper suggests how to measure the gap between business needs, internal-driven (influenced by company's choices) or external-driven (determined by external forces), determined by choices of the company or by factors out of the control, and the company's IS, and provides indications on the target configuration for the IS. The framework is based on an IT assessment model called "IS Maturity", which merges traditional IT assessment parameters, such as application portfolio coverage and integration degree, as well as

technological and architectural parameters providing flexibility to the IS.

Results of the application of the framework to a group of case studies is presented and discussed.

Lamis Al-Qora'n

PhD Student, University of Hull, UK

Neil Gordon

Senior Lecturer, University of Hull, UK

Septavera Sharvia

Research Assistant, University of Hull, UK

Martin Walker

Lecturer, University of Hull, UK

&

Yiannis Papadopoulos

Professor, University of Hull, UK

A Technical Approach for Safety Analysis of Clinical Workflows

A clinical workflow considers the information and processes that are involved in producing a clinical service. They are safety critical since even minor faults have the potential to propagate and consequently cause harm or even for a patient's life to be lost. Experiencing these kinds of failures has a destructive impact on all the involved parties (e.g. the patient, the patient's family, and the healthcare institution itself).

Due to the large number of processes and tasks included in the delivery of a clinical service, it is typically difficult to determine the individuals or the processes that are responsible for adverse events, since such an analysis is complex and slow to do manually. Using automated tools to do so can help in determining the root causes of potential adverse events and consequently help in avoiding preventable errors through either the alteration of existing workflows, or the design of a new workflow.

This paper utilises a safety analysis tool called Hierarchically-Performed Hazard Origin and Propagation Studies (HiP-HOPS) that is already in use in the field of mechanical systems, to describe a technical approach to safety analysis of clinical workflows. The paper then demonstrates the applicability of the approach to clinical workflows by applying it to analyse the workflow for the administration of radiation for cancer treatment.

HiP-HOPS analyses the workflow using Fault Tree Analysis (FTA) and Failure Mode and Effect Analysis (FMEA), the results of which indicate how the possible value failures in an input and internal component/process failures (or their combinations) can contribute to a

failure of the workflow, and thus the potential for patient harm or even death.

It is concluded that the approach is applicable to this area of healthcare and provides benefits through a combination of detailed information on possible risks and descriptive safety analysis based on experts' opinion. This provides a mechanism for the systematic identification of both adverse events and possible safeguards in clinical workflows, which is important in terms of identifying the causes of possible adverse events before they happen and therefore helping to prevent harm to the patient. Moreover, the approach helps in the clear definition of the workflow including its processes and tasks, which provides a valuable opportunity for formulation of safety improvement strategies.

Vimala Balakrishnan

Lecturer, University of Malaya, Malaysia
&

Zhang Xinyue

Lecturer, University of Malaya, Malaysia

Using Text Highlight and Page Re-views to Improve Search Engine Result Page

Studies have shown that user interactions with search results can provide relevance information on the documents displayed on the search engine result page (SERP). Therefore this study was undertaken with the aim to improve SERP, particularly the document relevancy by using two implicit feedback techniques, namely text highlight and the number of times a page is re-viewed. The original search results were re-ranked using an algorithm that took both the implicit feedback into consideration. Laboratory experiments were conducted and results showed improved relevancy when both these techniques were integrated. To be specific, the mean average precision (MAP) was found to be approximately 74.2%, and the average precision at level 100 (11-standard levels) was 56.8%, compared to the baseline algorithm (55% and 44%, respectively). Additionally, the normalized discounted cumulative gain also exhibits improved relevancy for the combined techniques (81%) than the baseline (69%). All the differences between the integrated model and the baseline were found to be significant. The overall results also indicate that more relevant documents were returned when both the implicit feedback techniques were integrated compared to single technique.

Muneer Bani Yassein

Associate Professor, Jordan University, Jordan

Dynamic Distance-Based Broadcast Scheme for Mobile Ad Hoc Networks

Broadcasting is the process of diffusing a message from a source node to every node in the MANETs and typically is used for distributing of control packets. In the absence of a base station, broadcast is responsible of all communications in the network using a blind flooding, which is the simplest broadcast technique. But even it's the simplest broadcasting technique, Blind Flooding is not reliable nor resource efficient. One of the schemes proposed to mitigate the Blind Flooding aspects is the distance-based scheme that depends on the relative distance between the node and its neighbors, where a node compares the distance between each neighbor node that previously re-broadcasted a packet and itself. In this research we are trying to propose a dynamic distance threshold value rather than a fixed one and examining its effectiveness under different levels of density and we are trying to focus on the effect of the dynamic distance threshold value on the performance of distance-based scheme using GloMoSim 2.03 simulation under varying networks conditions. The simulation results show that our protocols outperform simple flooding and fixed distance in terms of reducing overhead, end-to-end delay, Normalized Routing Load, and increasing the packet delivery ratio.

Erind Bedalli

Lecturer, University of Elbasan, Albania
&

Ilia Ninka

Lecturer, University of Tirana, Albania

Exploring an Educational System's Data through Fuzzy Cluster Analysis

Clustering is a very useful technique which helps to enrich the semantics of the data by revealing patterns in large collections of poly-dimensional data. Moreover the fuzzy approach in clustering provides flexibility and enhanced modeling capability, as the results are expressed in soft clusters, allowing partial memberships of data points in the clusters.

During the last decade, the digitalization of detailed student records of the University of Elbasan has not only simplified the typical university procedures but also it has created the possibility of a deeper view of the students' data. The cluster analysis applied on these student data can discover patterns which would assist in several strategic issues like: optimizing the student advising process, organization of curricula, adjusting the compulsory/elective courses, preparing better teaching approaches etc.

In our study, besides the classical fuzzy c-means, we will utilize several other variations like the possibilistic fuzzy c-means, the Gustafson-Kessel algorithm and the kernel based fuzzy clustering. We have found the application of several variations of the fuzzy clustering algorithms on these data to be a productive approach. Particular applications sometimes provide useful viewpoints which trigger innovative ideas for the policy-makers of the university.

Dejiu Chen

Associate Professor, Royal Institute of Technology, Sweden

Enhancing the EAST-ADL Error Model with HiP-HOPS Semantics

EAST-ADL is a domain-specific modeling language for the engineering of automotive embedded systems. The language has abstractions that enable engineers to capture a variety of information about design in the course of the lifecycle - from requirements to detailed design of hardware and software architectures. The specification of the EAST-ADL language includes an error model annex which documents language structures that allow potential failures of design elements to be specified locally with the intention that the effects of these failures are later on assessed in the context of architecture design. To provide this type of useful assessment, a languages and a specification are not enough; a compiler like tool that can read and operate on a system specification together with its error model is needed.

In this paper we extend the error model of EAST-ADL with the capability to include the precise semantics of HiP-HOPS - a state-of-the-art tool that enables dependability analysis and optimisation of design models. We present the extended EAST-ADL specification and its transformation into the HiP-HOPS model via the corresponding XML formats where these two specifications are represented. The connection of these two models at tool level enables practical EAST-ADL designs of embedded automotive systems to be analysed in terms of dependability, i.e. safety, reliability and availability. In addition, the information encoded in the error model can be re-used across different contexts of application with the associated benefits for cost reduction, simplification and rationalisation of dependability assessments in complex engineering designs.

Elena-Niculina Dragoi

Assistant Professor, "Gheorghe Asachi" Technical University of Iasi,
Romania

Silvia Curteanu

Professor, "Gheorghe Asachi" Technical University of Iasi, Romania
&

Vlad Dafinescu

Researcher, University of Medicine and Pharmacy "Gr. T. Popa",
Romania

Succinic Acid Separation Modelling Using a Hybrid Neural Network - Clonal Selection Algorithm

Succinic acid has a large area of applications (food industry, pharmaceuticals, agriculture, photography, cosmetic, and textiles), worldwide its demand increasing each year. Therefore, producing it efficiently (especially from bio-regenerable sources) is an aspect that researchers try to solve thorough different methods, one of the approaches being the use of process models for generating predictions and improving the production efficiency by process optimization. Since not all the processes can be efficiently modelled using conventional approaches based on physical and chemical laws, in this work, a combination of two bio-inspired algorithms represented by Neural Networks (NN) and Clonal Selection (CS) was employed for determining optimal models for the separation of succinic acid from the fermentation broths.

In the proposed modelling algorithm called hybrid Clonal Selection Neural Network (hCS-NNm), the NN acts as a model (part of its parameters being closely correlated with the most influential process variables), while CS (belonging to the Artificial Immune System class) is the optimizer which performs a simultaneous structural and parametric optimization of the model. Since CS and NN cannot be naturally combined, a direct, real-value encoding for the most important model parameters (number of hidden layers, number of neurons in each hidden layers, weights, biases, and activation functions) was employed. In order to improve the performance of the proposed algorithm, a local search method was introduced into the optimization procedure. At each iteration, the best so far solution was improved by randomly selecting one of the two local search algorithms, Random Search or Back-Propagation, this greedy approach raising the probability of determining good solutions.

A comparison with a previous version combining CS and NN, called CS-NN, was performed to demonstrate the efficiency of the proposed

hCS-NNm algorithm. The results showed that the algorithm improvements are translated into performance improvement, the model determined with hCS-NNm being better (in terms of mean squared error and relative error) than the one generated by CS-NN.

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Real-time Rendering and Updating Method for Electromagnetic Environment Based on CUDA

Electromagnetic environment is becoming more and more complex, rendering and displaying it is helpful for the commanders to understand the electromagnetic situation. This research focuses on the rendering of the dynamic electromagnetic environment, and implements this under the CUDA architecture. To improve the speed of updating data, parallel computing the volume data which are in a specific range is employed. Based on the data consistency, the parallel ray casting algorithm is carried out under the CUDA architecture to render the volume data which are bound to the 3D texture, and at the rendering time viewpoint changing is allowed. The experiment shows that using CUDA for computing and rendering can render the electromagnetic environment volume data in real-time even if the data are dynamic, and the rendering gets a good result for the distribution of electromagnetic situation and meets the requirement of real-time interaction.

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The Legal Protection of the Use of Images within Social Networks in an Australian Context

The use of social media in recent times has stirred issues in various disciplines. A particular concern is the use of images within social media. The rights of users exchanging, sharing and distributing images within social networks remains unclear. Users participating in social media share, exchange and distribute images which contain personal information. The tension between copyright and privacy law highlight the delicate nature that exists when users share and exchange images in social media. This paper examines the legal protection of the use of images within social networks in an Australian context and evaluates whether Australian copyright law provides adequate protection.

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Information Estimate the Mass of Initial Heterogeneity of Universe

A volume of the classic information in the initial heterogeneity I_{ht} of Universe must be a not less the volume of the classic information is in the natural laws, physical laws I_{pf}

$I_{ht} > I_{pf}$ The mass of the initial heterogeneity is proportional to the volume of the classical information in the physical laws, the temperature of the Universe is inversely proportional to the square of the speed of light: $m_{ht} > 1E+15 I_{pf} \cdot kT/c^2$ (to the square root of the time of life of our Universe). The mass of the initial heterogeneity of the Universe required to «memorize, storage» of physical laws ($1E+7$ classical bits) at the temperature of the Universe $1E+12K$ (the lifetime of the Universe $1E+10$ s) is about $1E-8$ kg (about one Planck's mass). To get the $1E+7$ classical bits of information at the time $t = 1E-34$ s, with the Fridman's expansion of the Universe, should have approximately $1E+5$ classic bits at a time $t = 1E-44$ s - the mass of the initial heterogeneity of the Universe $1E+12$ kg. At the sedate extension of the Universe in $1E-34$ s with $1E-10$ s with for on 1bit of the classical information it is shaped about 160 bits of the classical information. Therefore, for deriving $1E+7$ bits classical information at the moment of $1E-10$ s with is necessary for having about $1E+5$ bits classical bits at the moment of $1E-34$ s - order mass $1E+7$ kg. It, apparently, is impossible. Therefore, the initial information should to be generated, appreciably, at the inflationary extension of the Universe. At the inflationary extension of the Universe in $1E-34$ s with $1E-32$ s with from one bit of the classical information containing in initial discontinuities of the Universe the information content, the order of $1E+3$ bits of the classical information is shaped. At the inflationary extension from $1E-34$ s to $1E-32$ s and the further sedate extension of the Universe from $1E-32$ s to $1E-10$ s on one classical information bit it is shaped about $1E+5$ bits classical information. For deriving $1E+5$ bits classical information at the moment of $1E-10$ s, it is necessary to have about $1E+5$ classical bits at the moment of $1E-34$ s - order mass $1E+4$ kg. Such is an estimate of mass of initial heterogeneity of the Universe at the moment of $1E-34$ s, the mass necessary for "entry" of physical laws of the nature. It testifies in favor of the improved hypothesis to the initial information: «... At the moment of $1E-34$ s, all Universe has been concluded in field in radius of $1E-24$ sm... In this size already there was a heterogeneity of mass of the order $1E+4$ kg from

which all information on the Universe future was generated...». It is necessary to identify the initial heterogeneity of the Universe with concrete physical objects. It is important to understand how the recording of physical laws in the initial heterogeneity of the Universe and how enforcement takes place in the Universe written in the initial heterogeneity of physical laws.

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Using a Sensor Network for Energy Optimization of Paper Machine Dryer Sections

This paper presents a case study about using a low cost low power sensor network to save energy in paper machines.

By using wireless sensors for measuring temperature and humidity in the dryer section of a paper machine it is possible to optimize energy consumption by adjusting heating and air flow.

By using a number of low cost sensors at different locations for an extended period of time the dryer section can be run at a more critical level nearer to the design point. Since there is an exponential dependency between dew point and energy consumption, there is a large potential for energy saving even by moderate optimizations.

Typically such optimizations are conducted as a single point (e.g. one day) measurement, because a longer measurement duration would be costly: The cabling of the sensors in a production environment is too expensive to conduct such measurements on a regular or longer base.

Because the sensors need to be battery powered and send the data in near real time for monitoring purposes a low power network technology is needed. Bluetooth LE is not applicable because of the limited range, WLAN because of power consumption, so ZigBee was used. Signal strength measurement inside the dryer section of a paper machine showed that even low power ZigBee modules are provide sufficient signal strength. A prototype installation with a small number of sensors over a time of six weeks was made and showed interesting results. A first ad hoc optimization was done and lead to energy savings of some 80.000 € per year.

A second application of this technology would be continuous machine health monitoring: New paper machines have built in sensors for this purpose but upgrading older machines is prohibitive costly. With wireless low power sensor networks this is an option.

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Extensions to Shortest Job First Scheduling for Tasks of Mixed Criticality

Shortest Job First (SJF) scheduling offers the shortest average waiting time, but it suffers from the problem of potential starvation for tasks of longer duration. Several alternatives have been proposed over the years for improving the handling of the longer tasks by SJF. These approaches reduce the waiting time of the longer tasks but may affect overly the completion time of the shorter tasks. In this work, we develop an algorithm that is able to control the delay that the shorter tasks experience in order to accommodate the longer tasks. Experimental simulation results show that the proposed algorithm provides the designer with better scheduling alternatives than the ones available under the previous approaches.

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Image Based Human Behavior Recognition

In recent years, a camera is equipped with black box, home security system and many other smart devices. It is belong to human life style. From this point of view, human behavior recognition system has many positive merits and it can support many useful functions to user. This paper describes a machine learning approach for human behavior recognition which is based on 2D images of camera system. We propose two kinds of methods in this paper. The first is a pose recognition that human is on the phone. it can be useful, when human is watching TV or driving in a car. Such as auto control volume down or alarm to driver for safety driving. We define the pose as a hand grip pattern with a phone. In order to learn the pose data and make the classifier, Haar-like feature and Adaboost learning algorithm are used. The definition of pose and its resonable detection rate are one of the contributions in this paper. The second is looking ahead recognition for safety driving. In order to detect human is looking ahead or not, we propose our decision rule of looking ahead from extracted features based on images. This decision rule is also our contribution in this paper. Our approach consists of simple concepts and machine learning algorithm, but it can be useful method for human behavior recognition in front of device with camera.

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Air Traffic Data Integration Using Semantic Web Approach

Air traffic management systems require constant development. Whenever regular radar devices are out of range, the wide network of the receivers may constitute global air traffic monitoring solution. Surveillance methods of controlling aircrafts are being improved and the one which sets apart from the others is ADS-B (Automatic Dependent Surveillance Broadcast) introduced in most commercial and private aircrafts, obligatory after year 2020. Nowadays ADS-B receivers cover about 70% of European and 30% of U.S air traffic. ADS-B system is based on GPS communication. Aircrafts estimate their position using satellite based navigation systems. Along with plane position, there is vast number of additional data broadcasted by ADS-B transponder, including speed, altitude, plane and flight identification data, also emergency codes. The large amount of professional and amateur ADS-B receivers located on most continents, covering significant amount of the airspace, guided to the conclusion that this kind of crowd-processing may establish valuable and reliable source of the data if using common interface. Currently there is no uniform layer of the ADS-B data presentation and interfaces over the Web, however.

This paper regards standardisation of the data layer using WEB 3.0 - Semantic Web principals. It covers acquisition, processing and presentation of the data coming from ADS-B receiver. There has been proposed method of unifying data from distributed virtual radar stations and presenting in a way that allows to combine this data across many sources with existing knowledge. Having ADS-B information integrated and expressed in RDF (Resources Description Format), it would be easy to perform such query against these data sets using Protocol and RDF Query Language (SPARQL).

Now we stand at the verge of WEB 3.0, where applications vastly utilising Artificial Intelligence, semantic solutions and Natural Language Processing systems are going to be common.

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Modeling of Geo-location by Wireless Communications WLANs: WiFi

The indoor location, also called the location "indoor", is defined as a location in an indoor environment such as buildings, where GPS alone does not provide a precise location because of very low power levels of signals as well as influence the effects of multipath affecting these signals.

This is why alternatives based on readily available devices are emerging. In particular, the use of the IEEE 802.11 standard is useful for the development of a system of geolocation indoors. This development is based on the method of localization by trilateration operator RSS (Received Signal Strength).

The received signal strength allows us to calculate the distance between the mobile locate the access point, using propagation models valid in our environment, mentioned in the following paragraph.

This paper addresses the problem of geo-locating mobile devices in a wireless network. In fact, we place ourselves in the context of a Wi-Fi network, in which the terminals are indoors, where we can not resort to satellite positioning systems. That is why we propose to have recourse propagation model. To locate a mobile phone in a WiFi network was calculated the distances of the three access points, to do this we needed the powers issued by the latter and those received by the terminal, in order to integrate them into one of the propagation models simulated by MATLAB software.

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Testing Cloud Based Applications

This paper is about how to test PaaS (Platform as a Service) and IaaS (Infrastructure as a Service) cloud applications. The research covers Amazon Elastic Cloud and Windows Azure Applications, which test scenarios, are specific to the cloud and how you can optimize the testing in the context of the cloud.

There is an overview of the various testing technologies:

- Test on premise
- Code coverage for the cloud applications
- Test early in-cloud
- Cloud specific test scenarios
- Automate deployment
- Continuous integration
- In cloud performance testing
- Database performance tuning (focused on Windows Azure SQL Database)

The main reason to consider unit and integration testing of your cloud projects is to save time. Any small investment in testing can pay big dividends in time savings. When you consider all the aspects of unit tests, it should become clear that we must look at cloud applications from the perspective of their components and the dependencies that they take.

As a result will be demonstrated working prototypes. There is a comparison between the different approaches to analyze the advantages and disadvantages of each. The comparison will be done in financial and technical aspects.

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The Design of Middleware Support for Service-Oriented Things

In the past decade, many Internet based applications have adopted the service-oriented architecture (SOA) to facilitate easy discovery, composition and adoption of services from service providers on Internet. In the mean time, as the wave of Internet of Things (IoT) becomes more widespread and promising, many IoT projects have been conceptualized, designed and tested. Given the vision of IoT is to deploy and connect smart things on Internet, it is natural for us to build smart things as service components and apply the SOA paradigm on these physical devices in our environment to compose cyber-physical services. In this paper, we propose the vision of “Service-Oriented Things” (SOT) which is used to discover, compose and deploy mixed cyber and physical services so that developers can easily integrate Internet of Things with traditional IT. We present the WuKong project which is implementing the SOT programming support for future IoT enablement. WuKong has three features that make it attractive for IoT programming: sensor virtualization, service orientation, and user personalization. The WuKong middleware is designed to perform automatic sensor identification, device configuration, service composition, and system re-configuration. It allows the developer to design the application behavior at a higher level. An innovative sensor-based system management paradigm is also presented. The WuKong middleware and programming tool make it much easier to build smart services that are aware of and responsive to physical environment.

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Web Application for Parameter Estimation Using ADFIT Tool

This paper presents web application that provides a tool for numerical parameter estimation. It utilizes ADFIT (Automatic parameters estimation of mathematical models tool) that can solve mathematical models containing systems of ordinary differential equations. It uses both finite-difference and adjoint sensitivity analysis for introduced models. The research methods used to solve such equations are Euler and Runge-Kutta methods.

There has been created the web application for this tool, where the user with access provides experimental data into the program. Then objective function and its gradient are calculated. The user can choose the method of solving differential equation, determining the gradient and minimization algorithm, choose integration step and use genetic algorithm if necessary.

In order to increase program efficiency and improve the execution time, all calculations are made externally. At first, program generates file with C code for calculations and then compiled it to special MEX file and such file send for calculations. Tool focuses on solving complicated non-linear and high-dimensional models. It can also deal with rare in time and irregular measurement data.

Main advantage of the program is the ability to solve in a fast way models containing up to even 30 ordinary differential equations. One more novelty is ability to estimate the initial conditions for each equation in the system. It is very important since medical data usually lacks initial conditions.

To sum up, such tool can play an important role in analyzing medical data, especially DNA data, where we have a lot of information and we need to process them. The program is executing externally, so the performance time does not depend on computational capabilities of user's computer. Moreover, tasks are automatically queued so user does not need to wait to send data till previous task is terminated.

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Performance Evaluation of Wireless System Using ZigBee Protocol

The subject of this work is ZigBee wireless protocol and its performance. Devices used in our work are based on AVR microcontrollers and are set up by C++ code, within provided framework (i.e. by modifying user-end functions called from main program loop). The network is controlled by Coordinator connected to PC via RS232.

During our research, we were examining time of data delivery, network coverage in varying environment conditions and maximal data transmission rates. Time of data delivery was researched by assessing average time of frame delivery, and also total number of frames sent, correct and incorrect frames delivered. The average time measured was from 4 to 121ms with up to 4.9% of frames lost in worst case. Network coverage in varying environment conditions was assessed in three situations: devices placed within apartment, within built-up area and in open space.

With small distances the average time proved quite good, with acceptable data loss rates. On these distances as well as on greater ones time depends strongly on distance between Coordinator and End Device. In built-up area, with wire mesh fence and few 2.4GHz WIFI networks. The distance between devices varied were within standard but the average times have slightly worsened. Still, worst data loss stayed on similar level.

The tests in open space yielded similar average times as in built-up area. Considering the farthest measuring point was 200m from coordinator, obtained results were quite good, considering, that ZigBee standard assumes transmission range up to 100m. Maximal data transmission rates was investigated in small area $\approx 1\text{m}$ using networks consisting of two and three devices. For two devices, the best result was 6080 bit/s, but there is a 15.4% data loss, and devices were unstable. At

3040 bit/s data loss dropped to 0.1%, and devices were stable. It was determined that this was caused by using about 10% of processor time, above which devices restart. For three devices, the best result was 3040 bit/s with 3.9% data loss, and the devices were stable.

This sums up our experiments, leading to conclusion, that ZigBee is a good standard to transmit little amounts of data quite reliably and cost-efficiently.

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Digital Protection of Induction Motor

Induction motors are in fact the workhorse in modern industry due to their efficiency and low maintenance. They are involved in most industrial machines such as compressors, pumps, conveyors, mixers and cranes. In this paper, the design and implementation of a protection system for induction motors is presented. The first phase of the work involved the simulation studies of induction motors under abnormal operating conditions such as overloading, undervoltage, overvoltage, overspeed, voltage unbalance and short circuits faults. A digital protection algorithm is developed to respond for all the abnormal conditions and faults. Computer simulations were carried using Power System Computer Aided Design (PSCAD) software which allows the user to simulate those transient conditions. The currents and the voltages extracted from the simulations are used to test the developed protection algorithm under all abnormal conditions. The digital protection algorithm is coded and tested successfully in MATLAB.

In order to implement the designed digital protection system experimentally in real time, dSpace DS1104 controller board is used as the processing unit. The ability to program the board using Simulink (Matlab) makes it easier to design the protection system using different blocks and logic circuits. Moreover, the dSpace Control Desk is used to link the program with a Graphical User Interface (GUI) to provide a userfriendly interface to run the system. The protection algorithm implemented on dSpace was successful in detecting all types of abnormal conditions and faults. The results obtained experimentally

show that the proposed protection algorithm is capable of protecting the induction motor efficiently.

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Performance Evaluation of a Distributed File System for VDI Services

Recently VDI technology has been one of hot IT topics owing to many benefits such as security, energy-saving and so on. However it has been slow in its proliferation yet because of several key limitations. Storage is known as the most critical performance bottleneck point and the highest portion of cost at the installation phase. Storage has roughly three issues to be solved. The first issue is the high installation cost which may require high financial burdens to system providers. The second issue is storage isolation problem which SAN as a strong candidate for VDI storage has inherently. The last issue is related with system performance. In this paper, we have implemented a distributed file system, called VDI-FS, to overcome efficiently these limitations. VDI-FS is a scalable, high-performance distributed file system which supports well the characteristics of a VDI system. It makes a single file system with commercial servers with storage devices, instead of expensive SAN storage, and provides system scalability by the function of seamless storage expansion. Moreover in order to improve system performance based on our file system, we introduced a caching function between VM hosts and the file system. We measured the performance of the system with IOMark which is widely used to measure storage performance in VDI environment in the absence of standardized tools. It measures average response time with workload specified to VDI system and therefore can be used for VDI system sizing. Our experimental results showed that it is possible for our implementation to satisfy functions and performance required for VDI services with reasonable cost.

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TIARA Tutor for Time Efficiency Analysis of Recursive Algorithms

TIARA tutor is an enhanced version of the ESRATEA software developed to assist students in learning time performance analysis of recursive algorithms. The new features include an option for learners to use practice problems in sequential order in addition to problems randomly selected by the tutoring software. Sequential order is more desirable in the learning phase, while random selection of the problems is better when testing the level of student knowledge after they practiced. Practice problems list was extended to include some more challenging problems such as generating all permutations, generating power-set for the given set, and analysis of some graphical examples.

TIARA covers the following four categories of problems: decrease-by-constant-factor, divide-and-conquer, decrease-by-constant, and general-decrease-and-conquer. Each problem in TIARA tutor includes description of the problem in English and code implemented in Java language. Learners perform time analysis by determining problem size n , basic operation, and recurrences. Upon successful completions of those steps learners should solve the recurrences. Solution $T(n)$ specifies the number of times basic operation is performed as a function of the problem size. TIARA uses much simpler performance equivalent visualization examples that are based on template approach. The code in visualization example prints one letter whenever original problem performs basic operation while all other operations in the original problem (that are not basic operations) are omitted. In addition, visualization examples include plotted graphical pictures for the function $T(n)$, as well as the table of values for it.

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Development of a Software Package for Application of Parametric Estimation Models to Software Projects

In software projects, accurate estimation of software size and relevant labor effort is very important for the projects to be planned. It is clear that project managers need to make schedule and plan labor force by using estimation models. In case the effort estimation is accurately performed, then the construction of the project schedule is relatively straightforward. Therefore an effective workforce planning and scheduling can be made in the projects with the help of effort estimation. Making accurate cost estimation of software project is of crucial importance to all software industries.

There are many software metrics estimation methods, tools, and models that have been transferred to documents. Effort, time and speed of delivery of software projects can be calculated with the help of these effort estimation techniques.

In this study, parametric estimation models in the literature have been gathered together; and with the help of numerical methods (particularly regression and optimization techniques), new models have been proposed by using historical data (i.e. real software project metrics). Performance benchmarking of the existing models and new model have been made. In this context, a software package including all the models (the ones existing in the literature as well as the novel models proposed throughout this study) have been developed by using MATLAB GUI. To our belief, the mentioned toolbox will be an essential aiding tool for the project managers responsible throughout their software projects in the process of planning software developers, labor force and schedule especially at the beginning phase of the project.

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Quad-copter Self-positioning System for Precise Maneuvering during Landing Procedure

UAV's are nowadays getting every year more practical applications as well as are a subject of interest of hobbyists. Multi-copters are very interesting kind of UAV's offering for a reasonable price great maneuverability and expandability by additional sensors being a good platform for testing new solutions. The project is a trial of construction of a precise self-positioning quad-copter system for landing. Most of the nowadays positioning systems are based on GPS/GLONASS signal. Nevertheless such systems are not enough for precise landing procedure especially for small UAV's. Much better precision can be achieved using vision systems. Presented solution is based on the image processing system. Image of landing area is obtained from a camera fixed to the positioned UAV. The captured video image is transmitted over wireless connection to the ground station based on PC. On the computer the image is processed, the special marker located at landing position is recognized and appropriate control signals are sent back to the UAV. Control and video transmissions are realized over separate wireless links. The pattern recognition needed for the system is performed using OpenCV library. The system needs only an appropriate marker placed on the ground.

The paper is a general analysis of the project emphasizing the most interesting observations. It shows the influence of the image processing on the positioning performance and accuracy.

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A DSM for a Modeling Restful Sensorweb Network

Entering the era of Internet of Things, the use of Wireless Sensor Network and SensorWeb elements becomes daily. Information systems which must ensure that an increasing number of devices access and analyze the data collected from the wireless sensor nodes, have become complex and difficult to maintain. Due to the discrete nature of computer based systems, where the relationship between action and response may not be proportional, there is a huge risk when control is concerned. Design of unique sensor network that will meet the imposed needs sometimes is a serious task usually involving experts from different areas of the problem, design and implementation domains. On the other hand the introduction of novel technologies and techniques, like Domain Specific Modeling and RESTful service technology, in sensor networks design, raises the importance of problem domain. The involvement of such a wide variety of stakeholders, joined with the nature of computer based systems and the constantly changing methods and technologies, sometimes leads to the overall project failure mainly because of the lack of mutually agreed high level domain specific model. In this paper the specification of metamodel for RESTful SensorWeb Network modeling together with accompanying language editor are described. The verification and validation of its functionality is performed based on suitable examples of sensor network design models.

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A Web-Based Interactive Diabetes Registry for Health Care Management and Planning in Saudi Arabia

E-health is a rapidly growing technology worldwide providing proper health services at a lower cost with good quality and availability. Since diabetes has reached an epidemic stage in Saudi Arabia that has its medical and economical impact at the country level, data for better understanding and planning to prevent and manage this medical problem is badly needed.

Saudi National Diabetes Registry (SNDR) as an electronic medical file supported by clinical, investigational and management data is functioning as a monitoring tool for medical, social and cultural bases for primary and secondary prevention programs. The economical impact in the form of direct or indirect cost is a part of the registry's scope. The registry's geographical information system (GIS) with its environmental correlation produces a variety of maps for diabetes and associated diseases, in addition to availability and distribution of health facilities in the Kingdom. The electronic data bank serves as a research tool to help researchers.

A total of 84,942 patients have been registered during the period between 2000 and 2012 growing by 10% annually.

Part of SNDR reporting system is to assess quality of health care using different parameters, such as HbA1c. Economic reports give accurate cost estimation of different services given to diabetic patients, such as the annual insulin cost per patient, where 72.02% of the total insulin cost is spent on type 2 patients and 55.39% is in the form of premixed insulin. The SNDR can provide an accurate assessment of the

services provided for research purposes. For example, only 27.00% of registered patients had an ophthalmic examination and only 71.10% of patients with proliferative retinopathy had laser therapy.

The SNDR is an effective electronic medical file that can provide epidemiologic, economic, and geographic reports that can be used for disease management and health care planning.

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Modeling Process of Traffic Safety Terminology with the Igloos Software

New disciplines with a specific terminology develop because of the increasing technical progress. On the whole, this multidisciplinary effects as well the development of international communication problems between non-professionals and experts of a special field or between experts of different sciences. It becomes usual that technical terms are defined differently in different fields and languages.

Therefore, we will present the iglos terminology management system of the Institute for Traffic Safety and Automation Engineering of the Braunschweig University of Technology as a software platform which evolves different methodological approaches for solving lexical and terminological problems between terms of different varieties (technical languages) and languages. First of all, these include classical semantical relation problems as synonymy (relation of words with the same or similar meanings), antonymy (relation of words with the opposite meanings), hypernymy-hyponymy (relation between superordinates and subordinates) and ambiguity (relation of words with several meanings).

For example, the German term "Sicherheit" has two meanings and three translations in English, namely "safety", "security" and "certainty". Whereas the first two translations define the feeling of being under protection, the third translation describes the assurance. It is the main target of iglos to avoid the multilingual misunderstanding between special languages of different fields by standardising the definitions of technical terms. In our paper, we will treat the semantical differentiation between safety-related terms as "Sicherheit" in German and "safety" and "security" in English with the iglos terminology modeling process as one method for solving linguistic problems. The terminology modeling process generally consists of the following three steps: the extraction of definitions of the terms "safety" and "security" from different sources (e.g. dictionaries and encyclopedia, standards, scientific papers, glossaries etc.), the concrete definition of the terms mentioned above in different varieties and languages with the corresponding source informations and the relating of the terms on the

basis of the variety-based iglos sign model with different relation types. Among these relation types, there are for example the risk of confusion (isMixesUpWith), translation (hasTranslation), output (hasOutput, isOutputOf), input (hasInput, isInputOf), holonymy (hasPart, isPartOf), meronymy (isPartOf, hasPart), antonymy (hasAntonym), synonymy (isSynonymOf), polysemy (isPolysemOf) and homonymy (hasHomonym).

The important merit of the iglos sign model is to enable the specification of terminologies by avoiding terminological haziness and to create and visualise concrete unobstructedly typable relations between terms in a systematic context (variety). Finally, the multilingual and multidisciplinary communication should be the focus of the sign model.

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Efficiency Measurement of Epidemic Algorithms

Wireless Sensor Networks (WSN) are used to monitor different physical parameters in an environment of interest. Each node of the network is a sensor and is supplied with different components: the part of sensing, microprocessor that elaborates data, the transmitting and receiving component and power unit. The WSN has different limitations like: the transmission/receiving bandwidth of packets, the speed and processing time. The nodes are self responsible to organize the infrastructure of the network once they join the system. During this study we have simulated the performance of two Gossip algorithms for WSN, according to some parameters: the number of additional packets that are sent in network, the total time needed to update the whole system and the energy consumption for the information exchange between all the nodes. They are: the Randomized Gossip (RG) and the Gossip-Based Update Propagation (GBUP). At the RG algorithm the updating information is sent to all the neighbor nodes without asking before if those have already received this packet. This property of sending extra packets sometimes does not bring the updating of the neighbors, and it made us first believe that this additional number of packets will make the performance of it worse compared it with the second algorithm, but at our simulations it resulted totally different. While the packet of the information is sent to the neighbor the list of the neighbor nodes is updated with the elimination of the last node that sent the information. At the GBUP algorithm, an acknowledgement packet is sent and it is waited for the reply, and if it is negative the information packet is send to it. We have planned to model the real transmission medium taking into account the different phenomena that might happen once that the packet is sent through it.