

Conference Autonomous Systems AutSys 2014

26th – 30th October 2014 in Cala Millor, Majorca



German
Informatics Society



 FernUniversität in Hagen

Conference Autonomous Systems



Sunday, 26th October 2014

Please take care of the change to European Standard Time on this day.

- From 15:00** Registration in the Hotel Lobby/Restaurant close to Bar
- From 18:30** Dinner
- 20:00 – 21:00** Cocktail Reception and Formal Opening
Information on Conference Schedule, Excursion etc.
(Videoconference room in basement)

Monday, 27th October 2014

- 09:00 – 9:45** Keynote Prof. Dr. G. Heyer: Sentiment Analysis
- From 9:45** Meeting of Social Network Simulation Group (in Coffee Bar)
- 09:45 – 13:00** Session 1: Hardware and Embedded Systems
- 13:00 – 14:00** Lunch
- 14:00 – 17:15** Session 2: Content, Network and Services
- 17:30 – 18:30** Short Presentation Session I
- From 19:00** Dinner
- From 20:00** Discussion Round: Social Networks

Tuesday, 28th October 2014

- 9:00 – 17:00** Social Event (Excursion), Meeting Point Hotel Lobby
- From 18:30** Dinner
- From 19:30** Discussion Round: without fixed topic

Wednesday, 29th October 2014

- 09:00 – 13:00** Session 3: Theoretic Approaches and Algorithms
- 13:00 – 14:00** Lunch
- 14:00 – 16:45** Session 4: Systems, Models and Design
- 17:00 – 18:15** Short Presentation Session II
- From 19:00** Dinner
- From 20:00** Discussion Round: Natural Language Processing

Thursday, 30th October 2014

- From 9:00** Individual Discussions
- From 11:00** Individual Departures

Schedule of Talks I



All sessions take place in the videoconference-room in basement.

Monday, 27th October 2014

- 09:00 – 09:45** **Keynote Prof. Dr. G. Heyer, Universität Leipzig**
Title: Sentiment Analysis
- From 09:45** **Meeting of Social Network Simulation Group (in Coffee Bar)**
- 09:45 – 11:15** **Session 1: Hardware and Embedded Systems**
High-performance Computing for Embedded Control Systems
D. Verber, University of Maribor, Slovenia
An Inherently Safe Microprocessor Architecture
S. Widmann, FernUniversität in Hagen
A Consensus-oriented Crowd-verifiable Microprocessor Architecture
M. Schaible, FernUniversität in Hagen
- 11:15 – 11:30** **Coffee Break**
- 11:30 – 13:00** Realization of an Embedded Hard Realtime Softcore Processor
M. Kirchhoff, Technische Universität Ilmenau
The Test Concept for a Communication Link to an Unmanned Aerial Vehicle
Th. Hempfen and Th. Tempelmeier, Hochschule Rosenheim
Selected Aspects of Functional Programming Fostering ... within PEARL2020
C. K. Houben, FernUniversität in Hagen
- 13:00 – 14:00** **Lunch**
- 14:00 – 15:30** **Session 2: Content, Network and Services**
DocAnalyser – Searching with Web Documents
M. M. Kubek, FernUniversität in Hagen
A New Approach for Peer-to-Peer Information Retrieval Systems
P. Krause, FernUniversität in Hagen
A Categorization Scheme for Feedback in Networks
R. Leonhard-Pfleger, FernUniversität in Hagen
- 15:30 – 15:45** **Coffee Break**
- 15:45 – 17:15** Identifying Clusters within Facebook's User Behavior
S. Vongsingthong, Krirk University, Bangkok, Thailand
Integrated Cloud-based Computational Services
A. Lapin and E. Schiller, Université de Neuchâtel, Switzerland
Towards an Understanding of the IT Security Information Ecosystem
U. Lechner, Universität der Bundeswehr München
- 17:15 – 17:30** **Coffee Break**
- 17:30 – 18:30** **Short Presentation Session I**
Conflict in written communication – Annotation of an email corpus
Ch. Klotz, FernUniversität in Hagen
Phrase Word as Document Representation for ... of Plagiarism Detection
L. Krisnawati, Duta Wacana Christian University, Indonesia
Mining and Summarization Sentiment for ... in Online Social Networks
H. Hoang, FernUniversität in Hagen
Dynamic Chain Encryption Channel for ... Wireless Community Networks
E. Schiller, Université de Neuchâtel, Switzerland
- From 19:00** **Dinner**
- From 20:00** **Discussion Round: Social Networks**

Schedule of Talks II



Wednesday, 29th October 2014

- 09:00 – 10:30** **Session 3: Theoretic Approaches and Algorithms**
Gamification in a Consulting Company
M. Aiello, University of Groningen, Netherland
The Bahncard Problem and Upgrades
H. Lefmann, Technische Universität Chemnitz
Multi-factor Authentication for Internet Banking Login Process
S. Boonkrong, King Mongkut's University of Technology, Thailand
- 10:30 – 10:45** **Coffee Break**
- 10:45 – 11:45** Coloring of Interpreted Petri Nets
A. Bukowiec, University of Zielona Góra, Poland
On Transforming Graph-theoretical Problems into Ordinary Differential Equations
J. Ch. Chedjou, Alpen-Adria Universität Klagenfurt, Austria
- 11:45 – 12:00** **Coffee Break**
- 12:00 – 13:00** A Review of Object Classification for Video Surveillance Systems
M. Ali, Alpen-Adria Universität Klagenfurt, Austria
A Computerized Method to Diagnose Strabismus
A. Haj Mosa, Alpen-Adria Universität Klagenfurt, Austria
- 13:00 – 14:00** **Lunch**
- 14:00 – 15:30** **Session 4: Systems, Models and Design**
SoC Design for Complex Standalone Optical Measurement Devices
M. Müller, Technische Universität Ilmenau
Development of a Processing System with the 3W-Model
I. Kaiser, Technische Universität Ilmenau
Tool-supported Design of an Application-specific Soft Microprocessor
B. Däne, Technische Universität Ilmenau
- 15:30 – 15:45** **Coffee Break**
- 15:45 – 16:45** Deflection Queuing: Examining the Efficiency of a New Switching Approach
Z. Szeifert, Siemens AG, Karlsruhe
Power Electronics Converters: An Overview
G. Zhang, FernUniversität in Hagen
- 16:45 – 17:00** **Coffee Break**
- 17:00 – 18:15** **Short Presentation Session II**
Simulation of Structures of Social Network Users and Chatting Behaviour
T. Tran, FernUniversität in Hagen
On Privacy, Trust and Security in Social Networks
K. Nisar, Universiti Utara, Malaysia
A Random Walker based Method to Trust Management
T. Doan, FernUniversität in Hagen
Decentralized Self-Organizing Maps
H. Coltzau, FernUniversität in Hagen
Evolution of Networks
Th. Böhme, Technische Universität Ilmenau
- From 19:00** **Dinner**
- From 20:00** **Discussion Round: Natural Language Processing**



Paper 1

Titel: High-performance Computing for Embedded Control Systems

Author: Domen Verber

Abstract: A discussion is presented about integrating high-performance computing (HPC) within embedded control application design and implementation. HPC is usually only considered in connection with supercomputers and high-end servers. Due to the advances in computer hardware manufacturing over recent years it has become feasible to employ those architectures within the embedded control systems.

Some characteristics of hardware architectures and software development for HPC are discussed with the potential benefits for embedded systems. Then some practical uses of HPC techniques are given for modern embedded control systems. The discussion is augmented with the observations and the results from the relevant research studies and the experiments that were conducted within our research group.

Paper 2

Titel: An Inherently Safe Microprocessor Architecture

Author: Stefan Widmann

Abstract: Based on requirements derived from the international standard for functional safety IEC 61508 and various typical SW errors, an inherent safe microprocessor architecture is presented. The main goal of the architecture is to prevent SW errors to be made and to detect occurring errors as early as possible, ideally at the moment they occur, long before their effects show up in (intermediate) results.

Paper 3

Titel: A Consensus-oriented Crowd-verifiable Microprocessor Architecture

Author: Marcel Schaible

Abstract: In this paper a crowd-verifiable microprocessor architecture is presented. The control unit is relieved from complex processing logic by a table-driven approach and the decoding effort is simplified by defining all instructions equally long. Additionally the code and data memories are completely accomplished on-chip and all data words are tagged for type safety. The paper concludes with the outline of the consensus-oriented crowd verification methodology, which can be performed by non-field experts.

Paper 4

Titel: Realization of an Embedded Hard Realtime Softcore Processor

Authors: Michael Kirchhoff and Wolfgang Fengler

Abstract: This paper gives a summary of the authors research work in the field of embedded hard realtime systems. It will introduce a hard realtime embedded softcore processor and its special abilities. This paper discusses various ways to connect the softcore processor to any parent system and gives a realization and integration approach to an industrial standalone smart sensor device. In this context, it shows several challenges in re-engineering existing sequential algorithms to fit the requirements for embedded systems.

Paper 5

Titel: The Test Concept for a Communication Link to an Unmanned Aerial Vehicle

Authors: Thomas Hempfen and Theodor Tempelmeier

Abstract: The test concept for a communication link to an Unmanned Aerial Vehicle (UAV) is presented. As the communication link is vital for the UAV, special care has to be taken in order to ensure maximum reliability. In this contribution only a black-box test is considered. The test concept has its focus on component testing, but also considers the situation of integration testing at a later stage. Besides the usual procedures during testing, such as determining equivalence classes and boundary values, some aspects peculiar to the specific situation are presented.

Paper 6

Titel: Selected Aspects of Functional Programming Fostering Technical Safety within PEARL2020

Author: Christina K. Houben

Abstract: The new standard of the real-time programming language PEARL, called PEARL2020, is oriented at functional safety as defined in IEC 61508-3. The main attribute to reach technical safety in the sense of mitigating risk for human beings, ecological environment and capital expenditures is simplicity achieved by syntactic elements like cause-effect tables and textually coded function block diagrams. Another programming paradigm with a strong influence on PEARL2020 is the object-based one with classes, interfaces, encapsulation, parametric and ad-hoc polymorphism. A totally different view on programming is provided by the paradigm of functional programming. This paper aims to explain its properties and, as a consequence, the concepts emerging such as functions, theorem proving, write-once and call-by-name parameters. Beside definitions, advantages and drawbacks are evaluated with respect to safety.

Paper 7

Titel: DocAnalyser - Searching with Web Documents

Author: Mario M. Kubek

Abstract: Due to the large amount of information in the World Wide Web (WWW, web) and the lengthy and usually linearly ordered result lists of web search engines that do not indicate semantic relationships between their entries, the search for topically similar and related documents can become a tedious task. Especially, the process of formulating queries with proper terms representing specific information needs requires much effort from the user. This problem gets even bigger when the user's knowledge on a subject and its technical terms is not sufficient enough to do so. This article presents the new and interactive search application DocAnalyser that addresses this problem by enabling users to find similar and related web documents based on automatic query formulation and state-of-the-art search word extraction. Additionally, this tool can be used to track topics across semantically connected web documents.

Paper 8

Titel: A New Approach for Peer-to-Peer Information Retrieval Systems

Author: Patrick Krause

Abstract: Up to now searching in Peer-to-Peer information retrieval systems (P2P-IR) has been limited due to the structure used or has been very complex according to the administration effort. The main principles of existing systems are: either to distribute documents to other peers, even several times, or to assign peers to fixed clusters. In the first case, the characteristics of the peers get lost and in the second case the search is limited because of the cluster boundaries. You had to decide whether to get a fast but incomplete search or a complex system with several overlays. In this paper a novel P2P-IR-System with a new principle for searching is proposed. Therefore the disadvantages of existing structured and unstructured systems and search mechanisms are considered. The new system has to guarantee a complete search with minimized complexity. To facilitate this, the peers use bloom filter as addresses and form a global, dynamical and incomplete grid-system. All peers together establish a smart, global cluster with soft and dynamic boundaries between the topics. The number of Peer-to-Peer overlays is reduced to a minimum to decrease complexity. The positioning of the peers is based on the peer characteristics and the grid is self-balanced due to this positioning. Also the search follows the same principles of the positioning and is based on similarity. Therefore no additional effort for searching is needed and all possible results are found on searching.

Paper 9

Titel: A Categorization Scheme for Feedback in Networks

Author: Raphaela Leonhard-Pfleger

Abstract: Feedback mechanisms are an integral component of today's networks, especially for networks that have no central management instance. Feedback mechanisms are used for lots of purposes – from the initial creation over the routing and communication through to the handling of other complex and network specific challenges. Based on a comprehensive literature research this paper introduces a categorization scheme for feedback in networks. Beside an explanation of the evolutionary steps that lead to the scheme and details about the different categories of feedback mechanisms, this paper also introduces 'Feedback Oriented Network Creation Games' as a combination of the well known 'Network Creation Games' and the 'Categorization Scheme for Feedback in Networks'.

Paper 10

Titel: Identifying Clusters within Facebook's User Behavior

Authors: Suwimon Vongsingthong, Herwig Unger and Phayung Meesad

Abstract: Grouping users in social networks is an important process to improve understanding on the community characteristics of online social networks. Its benefit lies in the improvement of business, sociology and psychology. In this paper, real world data of Facebook identifying behaviors of users is collected through a survey form. To satisfy all our requirements, K-Means clustering is applied to disclose the community of users with different behaviors in using social network based on demographic data and daily activities. The behaviors which markedly deviate from other members will be treated as outliers for further observation. Using this approach, we are able to partition users into two different groups and identify their tendency of activities in Facebook. The clustering based mining applied has proven our hypothesis which stated that "Facebook users can be clustered based on their activities". Two communities is revealed, the majority community is 'Unevenful Facebook Users' and the minority is 'Facebook Sweetheart'. The outliers are those involved with any of specified activities in an extreme level. The contributions lie in the empirical findings to clarify users' behavior in Facebook which can be generalized to other social networks.

Paper 11

Titel: Integrated Cloud-based Computational Services

Authors: Andrei Lapin and Eryk Schiller

Abstract: This paper describes a general architecture of a cloud integrated solution for implementing tailored use-cases of various research communities. A successful implementation of a hydrogeological modeler deployed in the cloud proves the potential of the architecture. The knowledge and experience gathered throughout the hydrogeological use-case allow us to specify yet another similar scenario – a future NS3 modeler in the cloud for researchers of the networking domain.

Paper 12

Titel: Towards an Understanding of the IT Security Information Ecosystem

Authors: Elisa Canzani, Hans-Christian Heldt, Stephan Meyer and Ulrike Lechner

Abstract: Information privacy, Cyber threats and Cyber crime seem to be ubiquitous in the news. This article addresses publicly available information on IT-security, its availability and quality and presents an analysis of publicly available IT-security information for mobile devices in Germany. Methods and results of the analyses are presented in this paper. We conclude that there are hardly any patterns in terms of timeliness, content and quality. Users with an interest in IT security cannot rely on a single news channel.

Paper 13 Short Presentation

Titel: Conflict in written communication - Annotation of an email corpus

Author: Christine Klotz

Abstract: Knowledge about the way how persons with certain characteristics (e.g. sex, age, personality), in specific situations, (e.g. conflict, emotional moments), and by means of different communication channels behave, is essential to improve communication media. In a series of upcoming experiments, our team will focus on conflict detection in written interaction. For this purpose, we have access to real-world data comprising 39,000 emails between 156 professionals from one company. This corpus is full of work

instructions, coordination and planning messages, daily talk and gossip; only a small portion refers to conflict. From an organizational point of view, these emails are highly critical because conflict may decrease performance, motivation and participation, but also be an opportunity for group think and fruitful collaboration. Technical systems like email clients with conflict awareness, group work software with feedback functions, and optimized workflow tools could help in conflict detection, prevention and solution. For all these, text mining techniques that are capable of detecting conflict in written text is essential. Before we can apply automated methods, data preparation and annotation with human effort is necessary. The lecture presents the fundamental models that underlay our efforts, the data set with its favorable attributes, and finally the current state of work pointing out important problems and countermeasures during this project phase.

Paper 14 Short Presentation

Title: **Phrase Word as Document Representation for Candidate Document Retrieval of Plagiarism Detection**

Author: **Lucia D. Krisnawati**

Abstract: Despite of the flourishing researches in Plagiarism Detection (PD), little attention has been given to PD for Indonesian texts whose language is categorized as an agglutinative one. This research focuses on how to increase the retrieval of source documents (recall rate). Given the problem of agglutinative language and the requirements for a document defined as a work of plagiarism, we introduce the notion of phrase word as a document representation. A Phrase word is a meta-term that represents a consecutive occurrence of n-word. This phrase word is then used to compute the document vector using the cosine similarity measure.

In our experiments, we compared the performance of phrase word to terms and word n-gram. The queries are formulated by chunking the suspicious document into a defined length, selecting the n-highest and m-lowest rank of each document representation according to their tf-idf weights for each chunk. To evaluate the retrieval output on account of precision and recall, we constructed a near-duplicate detector using character n-gram and Jaccard coefficient. We set up 4 test sets and 2 plagiarism cases (PC): a phrase word with the string length (PW), a phrase word without string length (PS), term (ST), and n-gram (NG). After varying our parameters, i.e the chunk length, the number of queries for each chunk, and the combination number of the highest and lowest rank of features, we got that PW & PS show a significant increase of recall rate on 0.88 & 0.73 compared to ST with 0.66 in simulated PC. In Artificial PC, PW & PS's performance though it is not significant.

Paper 15 Short Presentation

Title: **Mining and Summarization Sentiment for Comments of Product in Online Social Networks**

Author: **Huu Son Hoang**

Abstract: Today, the number of users in social network is dramatically increasing. Millions users share opinions on different aspects of life every day. Therefore social network are rich sources for data mining especially opinion mining. Also users have more interested in following Advertisement on Online social network (ONS) such as Facebook, Google+. Each product attracts thousands users' comments that agree/disagree with the post content about whole or separate aspects. Such comments can be a good indicator for community opinion about the Item. It is required for customers or producers to make sentiment analysis to know the opinion of Online community in order to release suitable decision, therefore automatically opinion mining and summarization for feedbacks has become a hot research topic recently, Comparing to traditional text mining and summarization, Opinion mining and summarization for feedback aims at extracting the features on which the reviewers express their opinions and determining whether the opinions are positive or negative. We focused on the Advertisement on the Facebook to task of mining and summarization comments as reviews. We will focus to Rules based approach in order to extract aspect and decide the value of sentiment. Then, Reviewers are classified and evaluated based on their interest domain which is found out after text mining process from their profile and content generation (post, comment, and chat conversation). Finally, a summary aspect opinion model is proposed to estimate sentiment and important rate of each aspect of a item.

Paper 16 Short Presentation

Titel: **Dynamic Chain Encryption Channel for Static and Mobile Wireless Community Networks**

Author: **Eryk Schiller**

Abstract: We propose a chain encryption protocol which allows for the integration of a wireless community network with a broadband Internet service provider by satisfying the most important needs of these two. Our dynamic uplink/downlink chain encryption data channel provides every user with an Internet connection, while the Internet provider can benefit from the source, destination, and forwarding nodes of every data packet traversing the community network. The problem of reliable traffic statistics is definitely not trivial as the client terminals are not trusted from the provider's perspective. We managed, however, to restrict their behavior so that every node could leave a specific trace in the data packet upon send or forward. Such information may be further used by the provider to gather accurate traffic statistics, implement charging policies and billing. This allows the establishment of business relations with every particular user, e.g., the provider may strongly encourage its clients to enable packet forwarding by offering benefits for forwarded traffic. This procedure allows the provider to virtually enlarge the infrastructure by using the community network as its own extension. Network overhead of our protocol remains at an acceptable level, and we outperform the state of the art protocols in selected areas.

Paper 17

Titel: **Gamification in a Consulting Company**

Authors: **Frank Blaauw, Lena Bazylevska and Marco Aiello**

Abstract: Gamification refers to the use of game-design elements in a non-gaming context. The consulting company Capgemini has set up a rudimentary gamification platform, to motivate the employees to do extra work for the company in their spare time. In order to reward people for this effort, they can request badges, which are virtual representations of achievements. A team of other employees decide whether or not the badge is granted.

The gamification platform can answer a number of research questions on the efficacy and effectiveness of such platforms. For instance, what is the relation between authoritativeness of people in a professional organization? In the present work, we focus on the design of a gamification solution and combine a gamification platform with an existing company-wide social media service. Statistical analysis on both the social graph and the gamification data shows the correlations between the social network and the number of badges or types of badges the players have earned. The analysis focusses mainly on authoritativeness of people; a measure to determine the importance of a person in a social network. Early results show that a correlation exists between the quantity of badges or types of badges. The result strengthens the foundation why one should implement a gamification platform and how important the social structure in the sense of social media is for the value of it.

Paper 18

Titel: **The Bahncard Problem and Upgrades**

Authors: **Hanno Lefmann and Dirk Winkler**

Abstract: In this paper, the Bahncard Problem is investigated: When travelling with the German railway system (Deutsche Bahn AG), one can buy a regular ticket or try to save money by buying a Bahncard, which is valid for one year and, depending on the card type, reduces ticket prices by 25%, 50%, or even 100%. Since low ticket fares do not justify the additional expense, the problem is to determine if, when, and which type of Bahncard to buy in order to minimize costs. However, with increasing traveling costs and holding a Bahncard with discount 25%, one might like to upgrade to, say, a Bahncard with discount 50%. Here we consider this Multi-Bahncard Problem, when a fixed number of available Bahncards is available in the offline Situation.

Paper 19

Titel: Multi-factor Authentication for Internet Banking Login Process

Author: Sirapat Boonkrong

Abstract: Internet banking has shown that it is one of the most used services online. One important security mechanism that is used to protect Internet banking is authentication. It will be explained here that existing authentication mechanisms during the login stage still have problems. This paper designs a simple three-message protocol that we believe can improve the security of the login process. The proposed mechanism applies the idea of multi-factor authentication, which includes the use of password, salt value, iteration number and digital signature, rather than just using a password. A proof of correctness and security is provided to ensure that secure mutual authentication and transaction authentication achieved at the end of a protocol run.

Paper 20

Titel: Coloring of Interpreted Petri Nets

Authors: Arkadiusz Bukowiec, Tomasz Gidlewicz and Jacek Tkacz

Abstract: In the paper, coloring of interpreted Petri nets is proposed. The traditional algorithms are developed for plain Petri nets and they do not count output symbols. As the interpreted Petri nets are one of the way of specification of control algorithm for application specific logic controllers and coloring algorithms are used for verification and implementation it is very important to color places with the same output symbols by the same color. The proposed solution extends classic color algorithm by additional condition to count output symbols. It detects additional conflicts that are caused by output symbols. There are classified several types of such conflicts. There is proposed a method of conflict resolving by adding additional colors or adding empty places.

Paper 21

Titel: On Transforming Graph-theoretical Problems into Ordinary Differential Equations

Authors: Jean Chamberlain Chedjou, Kyandoghere Kyamakya, Baraka Olivier Mushage and Nkiediel Alain Akwir

Abstract: We develop and validate through some illustrative examples an efficient approach/concept for modelling the shortest path detection problem in network graphs by nonlinear ordinary differential equations. The quintessence of the concept is presented as well as how far it does outperform the related current state-of-the-art. We show that the proposed concept is a good candidate to overcome several limitations (or drawbacks) of the current state-of-the-art. Specifically, it is demonstrated that the proposed concept can tackle (or solve) some of the well-known and unsolved problems by the current state-of-the-art. Examples of these problems are the low accuracy (or low precision), weak robustness (or weak stability), lack of flexibility, and poor re-configurability potential (just to name a few) of the classical concepts, methods and algorithms for finding shortest path in complex and reconfigurable networks. As proof of concepts of the proposed method, two application examples are considered by investigating the shortest path detection problem in the cases of directed and undirected graphs. The efficiency and flexibility of the novel concept for finding shortest paths are demonstrated.

Paper 22

Titel: A Review of Object Classification for Video Surveillance Systems

Authors: Mouhannad Ali, Fadi Al Machot, Ahmad Haj Mosa, Patrik Grausberg, Nkiediel Alain Akwir, Baraka Olivier Mushage and Kyandoghere Kyamakya

Abstract: Object classification in video surveillance systems is a major research field for robust event detection. It is an important step for improving the reliability of various smart applications in visual sensor networks. This paper presents a comprehensive review of the state-of-the-art methodologies for object classification. It proposes various evaluation techniques regarding robust performance estimations in video surveillance systems. It illustrates a large variation of dynamics contexts and their effects in visual scenes.

Paper 23

Titel: A Computerized Method to Diagnose Strabismus

Authors: Ahmad Haj Mosa, Mouhannad Ali, Fadi Al Machot and Kyandoghere Kyamakya

Abstract: Strabismus is a disease of the human visual system in which the eyes are not properly aligned which results in gazing in different directions. This paper presents a computer vision driven method for a quantitative decision support in the diagnosis of the disease. An infrared (IR) camera with IR illumination is used to capture the patient eyes. The proposed method estimates the normal vectors of both pupils, and measures the enclosed angle while the patient gazes at different predefined points. The two main processing steps in the proposed algorithm are: (i) A novel method was developed to detect the ellipse of the pupil in the image frame; this method uses a line integral to detect the pupil ellipse in real time. (ii) Estimation of the pupil normal vector based on the parameters of the segmented pupil ellipse.

Paper 24

Titel: SoC Design for Complex Standalone Optical Measurement Devices

Authors: Marcus Müller, Torsten Machleidt and Wolfgang Fengler

Abstract: White-light interferometry is an optical measurement method with a wide range of applications in the quality assurance domain. While capable of high-precision results given enough processing performance, industrial-grade implementations are still an area for research and optimization. This paper discusses specific challenges of embedded implementation of WLI processing and presents approaches to System-on-Chip solutions to be integrated in an industrial standalone smart sensor device.

Paper 25

Titel: Development of a Processing System with the 3W-Model

Authors: Irina Kaiser, Wolfgang Fengler and Thomas Fröhlich

Abstract: This paper gives a summary of the authors' research work in the field of information processing systems in the measurement domain. The realization of a prototype for the information processing system in the dynamic weighing technology presented here is based on the self-developed concept of the 3W-Model. The highperformance embedded system used for the implementation is based on an FPGA. Along with an overview of the state-of-the-art for the FPGA-based embedded system and the application-specific development, a case study is presented, with focus on specific requirements in the measurement domain. Special attention is paid to ability for official calibration and the metrologic reliability. A current research topic in the dynamic weighing technology is introduced and a concept of a prototypical solution for an information processing system is discussed highlighting these special requirements.

Paper 26

Titel: Tool-supported Design of an Application-specific Soft Microprocessor

Author: Bernd Däne

Abstract: This paper reports about an ongoing case study that deals with embedded systems design. Target is an FPGA based system including a multi-core soft microprocessor. The case study investigates how different components of the design can be integrated into a homogenous design flow using a single commercially available design tool. Some details are presented; some open questions and possible solutions are discussed.

Paper 27

Titel: Deflection Queuing: Examining the Efficiency of a New Switching Approach

Author: Zoltan Szeifert

Abstract: Knowingly input queued communication network switches suffer under the head-of-line blocking phenomenon. Over the last decades numerous queuing approaches has been developed to resolve congestions and enhance the switching performance. Because of the complexity of the solutions only some of them are implemented, primarily in high-end products. A simply solution is still required that could be applied in all product classis. This present article examines Deflection Queuing as an economical solution that can effectively mitigate head-of-line blocking.

Paper 28

Titel: Power Electronics Converters: An Overview

Authors: Guidong Zhang, Zhong Li, Bo Zhang and Wolfgang A. Halang

Abstract: The history of power electronics converters is reviewed in this paper, and a new impedance source converter, which is different from the traditional source converters and can overcome their disadvantages, is introduced. Then, the unique features of the impedance source converters are analyzed and design criteria are extracted. In order to fulfill the ever severe demand of various power electronics converters of high performance and high efficiency, a systematic design schema of impedance source converters is presented. Z-source converters have exhibit eminent advantages over traditional converters and the Z-source technology should be further improved and applied in practice.

Paper 29 Short Presentation

Titel: Simulation of Structures of Social Networks Users and Chatting Behaviour

Author: Thi Minh Chau Tran

Abstract: CB (Chatting behaviour) in the relationship that exists between a person's social group and his/her personal behaviour has been a long standing goal of social network analysts. This paper sets out the design of a new methodology for searching UB (User's behaviour), and investigates how structures of Network users and CB reveal that people who chat with each other are more likely to share interest and have their goals (make friends, dating, jobs, hobbies, sharing, ads, and cheating goals). The more time they spend talking, the stronger this relationship is. People who chat with each other are also more likely to share other personal characteristics. However, there is much different behaviour from countries, religions... Our analysis and simulation are based on programming in Javal environment with the goal collects UB so that people can save the time in chatting, and early warn in case of critical situations that are crucial (cheating, rude behaviour profiles). It also can collect different UB in groups, countries, and religions... Thus, managers are alerted at an early stage and can able to take preventive actions. People can gain their goal in chatting easilier when they can know each other's behaviour.

Paper 30 Short Presentation

Titel: On Privacy, Trust and Security in Social Networks

Author: Kashif Nisar

Abstract: The rapid advancement and exponential use of social digital media over the last decades has led to a rise in popularity of social networks. Privacy and trust are playing important role in a web-based social network. Given the open and dynamic nature of such an online virtual community, trust evaluation relies on transitive relationships among the direct and indirect neighbors of an evaluator.

Security is one of the major issues which hamper the growth of cloud. The idea of handing over important data to another company is problem; such that the consumers need to be vigilant in understanding the risks of data breaches in this new environment. A specific objective of this research is to analyses and optimization of social networks with respect to security threats; maximize the network's good put. In order to achieve efficiency gains in the setting of major issues in social network, optimization and security need to be addressed.

In this research, we will do a detailed analysis of the social cloud security issues and challenges focusing on the social media and the service delivery types. We will also investigate and design a preliminary new model of social network security.

Paper 31 Short Presentation

Titel: A random walker based method to trust management

Author: Trung Son Doan

Abstract: The rapid advance in computational power and communication capacity on online social network (OSN) has been a double-edged sword:

On one hand, it has enabled the construction of trust management unlike Peer-to-Peer reputation system where conducted under assumption that all peers in the network are unknown and untrusted that can store, gather and process large quantities of user-interaction and user-generated content. On the other hand, it has allowed more sophisticated attacks on the integrity of the vulnerable trust management.

Therefore, we need to design a manipulation-resistant trust management system against strategic threats especially as collusive attacks. In this talk, we come up with a new concept TrustRank, a trust value for each user in a complex OSN, following random-walker based fully distributed approach, which technique is proved to generate the same result with PageRank. Our view point sheds some new light on the future question whether we can design protocols to avoid trust value manipulations with the same mentioned technique.

Paper 32 Short Presentation

Titel: Decentralized Self-Organizing Maps

Author: Hauke Coltzau

Abstract: Self-Organizing Maps (SOMs) help to understand the topology of multi-dimensional data and navigate through it more intuitively. They can serve as a tool to organize content in decentralized systems, helping users to find objects they are looking for without having to define exact search criteria beforehand. However, existing algorithms to create self-organizing-maps from any given set of data need global knowledge in both the training phase and when searching for data in the map and thus cannot be used in decentralized systems.

In our work, we have developed and tested algorithms to build self-organizing maps in a totally decentralized manner. First, the existing GHSOM approach by Rauber et. al., which already has a decentralized characteristic, has been extended to provide fault tolerance and still remain scalable and efficiently manageable. Secondly, a new approach based on dynamically created Kleinberg-like far-distance links is presented, which does not have to rely on hierarchical structures like GHSOM.

Paper 33 Short Presentation

Titel: Evolution of Networks

Author: Thomas Böhme

Abstract: We consider the evolution of networks controlled by node-agents. The node-agents see only part of the network (their local view). They can delete existing edges and create new ones. Models of this kind have been considered under the name of network creation games. Here, the agents try to optimize their local payoff, and a typical question is how far the resulting networks are from a "social optimum". The present talk deals with a closely related but different question. We ask what network parameters (e.g. diameter) can be achieved given the local views of the agents.