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Computer Science and Its Applications

5th IFIP TC 5 International Conference, CIIA 2015
Saida, Algeria, May 20–21, 2015
Proceedings

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Preface

This volume contains research papers presented at the 5th IFIP International Conference on Computer Science and Its Applications (CIIA), held during May 20-21, 2015, in Saida, Algeria. CIIA 2015 continued the series of conferences whose main objective is to provide a forum for the dissemination of research accomplishments and to promote the interaction and collaboration between various research communities related to computer science and its applications. These conferences have been initiated by researchers from Algeria and extended to cover worldwide researchers focusing on promoting research, creating scientific networks, developing projects, as well as facilitating faculty and student exchanges, especially in Africa.

This year the CIIA conference attracted 225 submissions from 20 countries including: Algeria, Bangladesh, Belgium, Canada, China, Finland, France, India, Iran, Ireland, Italy, Jordan, Morocco, Norway, Poland, Qatar, Tunisia, United Arab Emirates, UK, and USA. In a rigorous reviewing process, the Program Committee (PC) selected 51 papers, which represents an acceptance rate of 22.6%. The PC included 200 researchers from 27 countries.

The accepted papers were organized into the four following research tracks: Computational Intelligence, co-chaired by: Sadok Ben Yahia (FST, Tunisia) and Nadjat Kamel (Setif University, Algeria); Security and Network Technologies, co-chaired by Nadjib Badache (CERIST, Algeria) and Alfredo Cuzzocrea (ICAR-CNR and University of Calabria, Italy); Information Technology, co-chaired by Jorge Bernardino (ISEC-Polytechnic Institute of Coimbra, Portugal) and Selma Khouri (ESI, Algiers, Algeria); as well as Software Engineering, co-chaired by Kamel Barkaoui (CNAM, Paris, France) and Abdelwahab Hamou-Lhadj (Concordia University, Montreal, Canada). Additionally, the conference hosted three keynote speakers, namely: Prof. Lynda Tamine-Lechani (IRIT Toukouse, France), Prof. Erich Neuhold (University of Vienna, Austria), and Prof. Mohamad Sawan (Polytechnique Montreal, Canada). This volume includes the abstracts of the keynote talks. We would like to express our warmest thanks to the keynote speakers.

We would also like to extend our gratitude to Prof. Erich Neuhold and the International Federation for Information Processing (IFIP) for accepting the CIIA papers to be published in the *IFIP Advances in Information and Communication Technology* (IFIP-AICT) by Springer.

We would also like to acknowledge the invaluable help of: the PC members for ensuring the quality of the scientific program, the Tahar Moulay University of Saida and the GeCoDe Laboratory, for hosting the conference and providing all the needed support, the track chairs, for managing the reviewing process, and Dr. Mickael Baron

(ISAE-ENSMA, Poitiers, France) and Dr. Mahieddine Djoudi (SIC/XLIM, University of Poitiers, France) for Webmaster efforts. Last but not least, we thank the EasyChair team for making available their conference management system to CHIA. Finally, we thank the authors who submitted papers to the conference.

April 2015

Abdelmalek Amine
Erich J. Neuhold
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Invited Talks

Interoperability: Models and Semantics - A Reoccurring Problem

Erich J. Neuhold

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Abstract. Interoperability is a qualitative property of computing infrastructures that denotes the ability of the sending and receiving systems to exchange and properly interpret information objects across system boundaries.

Since this property is not given by default, the interoperability problem involves the representation of meaning and has been an active research topic for approximately four decades. Database models used schemas to express semantics and implicitly aimed at achieving interoperability by providing programming independence of data storage and access.

After a number of intermediate steps such as Hypertext and XML document models, the notions of semantics and interoperability became what they have been over the last ten years in the context of the World Wide Web and more recently the concept of Open Linked Data.

The talk will investigate the (reoccurring) problem of interoperability as it can be found in the massive data collections around the Big Data and Open Linked Data concepts. We investigate semantics and interoperability research from the point of view of information systems. It should give an overview of existing old and new interoperability techniques and point out future research directions, especially for concepts found in Open Linked Data, the Semantic WEB and Big Data.

Brain-Computer-Brain Interfaces for Sensing and Subsequent Treatment

Mohamad Sawan, Professor and Canada Research Chair

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Abstract. Implantable Brain-Computer-Brain Interfaces (BCIs) for diagnostic and recovery of neural vital functions are promising alternative to study neural activities underlying cognitive functions and pathologies. This Keynote address covers the architecture of typical BCI intended for wireless neurorecording and neurostimulation. Massively parallel multichannel spike recording through large arrays of microelectrodes will be introduced. Attention will be paid to low-power mixed-signal circuit design optimization. Advanced signal processing implementation such as adaptive thresholding, spike detection, data compression, and transmission will be described. Also, the talk includes Lab-on-chip technologies intended to build biosensors, and wireless data links and harvesting power to implants. Tests and validation of devices : electrical, mechanical, package, heat, reliability will be summarized. Case studies will be covered and include research activities dedicated to vision recovery through implant used to apply direct electrical microstimulation, to present the environment as phosphenes in the visual field of the blind. And we will summarize latest activities on locating epileptic seizures using multi-modal fNIRS/EEG processing, and will show the onset detecting seizure and techniques to stop it, using bioelectronic implant.

Collaborative and Social Web Search

Lynda Tamine

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Abstract. Web search increasingly reflects problems grounded in the real-life world that requires the assistance of social resources. Social web search refers broadly to 1) the process of searching information over user-generated content (UGC) or 2) searching online with the help of users (such as friends, colleagues or experts) using large-scale social networking services. Examples of such services include Facebook, Twitter and MySpace and are considered as complementary to web search engines. Collaborative search is a kind of social search where small-scale groups of users are all together engaged in solving a shared information need. Collaborative and social search allow the gathering of users' complementary knowledge and skills that lead to the emergence of collective intelligence.

The aim of this talk is to 1) outline the paradigm of social search, 2) investigate the research issues that it gives rise to and then 3) point out the opportunities it brings to nowadays society.

I will look back over the past recent years highlighting some of the major changes in social-centred approaches of information search and related main research findings. I will also give an overview and share some experiences we gained through our previous research investigations in the area of collaborative and social search.

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