

## GUEST EDITORIAL PREFACE

# **Special Issue of Best Papers Presented at the 2012 International Conference on Computing and Communication Technologies RIVF (Research, Innovation, and Vision for the Future)**

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This special issue encompasses extended versions of the best papers presented at the 2012 International Conference on Computing and Communication Technologies RIVF (Research, Innovation, and Vision for the Future). They were mainly selected articles of the track: Communication and networking. Started in 2003, the International Conference on Computing and Communication Technologies RIVF has become a major scientific event for researchers in the field of Computing and Communication Technologies in Vietnam and worldwide. This conference, originally scheduled every 12 months in Vietnam, is, since 2009, scheduled every 18 months.

RIVF 2012 was the 9th edition of this conference and was hosted by Ho Chi Minh City University of Technology, Ho Chi Minh

City University of Science, VNU-HCM, Vietnam, sponsored by the IEEE Communications Society and IEEE Computational Intelligence Society. Previous RIVF conferences have been held at the Institut de la Francophonie pour l'Informatique (Hanoi, 2003, 2004), University of Can Tho (2005), VNU - Ho Chi Minh City University of Technology (Ho Chi Minh City, 2006), Hanoi University of Technology (2007), VNU - Ho Chi Minh City University of Science (Ho Chi Minh City, 2008), Da Nang University of Technology (2009), and VNU - Hanoi University of Science (2010).

The objective of this conference is to offer an opportunity for researchers and innovators to discuss problems, share results, identify emerging issues, and establish academic collaborations in various disciplines of computing

and communications. Additional information and history of the RIVF conference series can be found on the web site of the conference: [www.rivf.org](http://www.rivf.org).

The first article “Principles of Soft Verification” concerns messages transmitted over a noisy channel and using the Message Authentication Code (MAC) for the sake of authenticity. To reduce the error rate, the standard forward error correcting channel code is assumed but no Automatic Repeat reQuest is used to correct the remaining errors (messages are not retransmitted). The uncorrected errors cause the rejection of messages with a wrong MAC. The article introduces an extension of the verification of MACs, whose result is not “true” or “false” but a “soft” verification i.e. a trust level. A definition of “Trust Level” will be given, together with an algorithm of “soft” verification, which provides a “Trust Output”.

The second article “A combined algorithm of Kalman estimator and Guard Interval optimization for Mobile WiMAX” concerns the Mobile WiMAX (Worldwide Interoperability for Microwave Access) system which has been recently applied widely in wireless communication systems. The article addresses channel estimation algorithms for the mobile WiMAX system. The comb-type pilot was used for channel estimation algorithms. An adaptive algorithm of channel estimation based on Kalman filter which had good performance in fading channels is proposed. Based on the result of channel estimation, an advanced algorithm of GI (Guard Interval) optimization is presented. All results have been verified by computer simulation.

The third article “Pragmatic Correlations of Quality-of-Experience and Quality of Service in IMS-based IPTV Networks” studies the changing behavior of QoE with respect to changes of QoS parameters in the context of video streaming service in an IP Multimedia Subsystem-based IP Television network (IMS-based IPTV network). Authors study QoE in both terms of Mean Opinion Scores and VQM as functions of each single QoS parameter such as: loss, jitter, and delay. The correlation

between QoE and multiple QoS parameters are introduced. Authors claim that the QoE-QoS correlation could be a significant first step to build a smart QoE monitoring and control mechanism as an added value to promote the IMS-based IPTV network.

The fourth article “BAM-Chord: DHT-based Bandwidth Adaptive Multicast System” addresses the problem of applying Distributed Hash Tables (DHTs) to application-level multicast. Despite the numerous advantages of this approach, an effective bandwidth utilization method is required for DHT-based multicast systems. Authors present the BAM-Chord (Bandwidth Adaptive Multicast over Chord) which is a DHT-based multicast system that focuses on host heterogeneity, network scalability and effective bandwidth utilization. With this approach, when a node joins into the system, it finds out an appropriate position (i.e. node identifier) on a BAM-Chord ring and creates links to neighbor nodes based on node’s bandwidth capacity such that a multicast tree can be built efficiently and balanced. Author claim that this approach allows to utilize bandwidth of every node efficiently, reduces the depth of the multicast tree, increases network scalability and takes advantages of DHTs in maintaining the multicast tree.

The fifth article “Low-latency, Small-area FPGA Implementation of the Advanced Encryption Standard Algorithm” presents a Field-Programmable Gate Array (FPGA) implementation of an Advanced Encryption Standard (AES) algorithm using approach of combination iterative looping and Look-Up Table (LUT)-based Substitution-Box (S-box) with block and key size of 128 bits. Modifications in the way of loading data out in AES encryption/decryption, loading key\_expansion in Key\_Expansion blocks are also proposed. The design is tested with the sample vectors provided by Federal Information Processing Standard (FIPS) 197. Authors claim that the proposed solutions are very simple in FPGA-based architecture implementation, better in low latency, and small area, but large in memory, moderate throughput.

The last article "Energy Saving in Forward Fall Detection using Mobile Accelerometer" broaches the problem of forward fall detection methods using only mobile phone accelerometer. The main objective is to save energy without sacrificing accuracy. Using peak threshold algorithm in axes of mobile accelerometer, transition from activity of daily living (ADL) to forward fall event is recognized. The computation is done using Dynamic Time Warping (DTW). The feasibility and the pertinence of the proposed approach are demonstrated through effective implementation of this approach on mobiles phones.

We wish to thank the RIVF conference and the authors for their contributions to our journal and we wish the readers will appreciate content of this special issue.

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*Pierre Kuonen obtained the Master degree in electrical engineering from the Swiss Federal Institute of Technology (EPFL) in 1982. After having worked during six years in the industry (petroleum and CAD development) he joined, in 1988, the Computer Science Theory Laboratory of the Computer Science Department of EPFL. He was involved in teaching and research on parallel programming and Computer Science Theory. He obtained the Ph.D. degree in 1993. From 1994 to 2000 he has been a scientific collaborator, heading the Parallel Computing Research Group (GRIP) at EPFL and was senior lecturer of the course Parallelism. During this period he managed several European and national research projects. In February 2000 he joined the University of Applied Science of Valais (HES-SO//Valais) as computer science professor. From the beginning of March 2002 he started to progressively transfer his activity from the HES-SO//Valais to the University of Applied Science of Fribourg (HES-SO//Fribourg). Since 2003 he is full professor at the University of Applied Science of Fribourg in the Institute of Information and Communication technologies (ITIC) where he is leading the GRID & Cloud Computing Group. Besides his teaching activities he continues to actively participate to national or international research projects mainly in the field of HPC, GRID and Ubiquitous Computing. Pierre Kuonen is author or co-author of more than 80 scientific publications. He is member of the steering committee of the RIVF conference and associate editor of IJ DST.*