Certificate of Attendance

I, Laurent Schumacher, hereby confirm that Thijs Roger from Euro-Support, Inc. has attended to the 20th IEEE Symposium on Communications and Vehicular Technology in the Benelux (IEEE SCVT 2013) held in Namur on November 21, 2013.

On behalf of the Local Organising Committee,

L. Schumacher

IEEE SCVT 2013

20th IEEE Symposium on Communications and Vehicular Technology in the Benelux

Namur, November 21, 2013

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09:00 – 09:30 Registration and coffee/tea

09:30 – 09:35 Welcome by conference chair

09:35 – 10:20 *Keynote Talk*

SDN overview and application to mobile networks

Hagen Woesner

EICT, Germany

The talk provides a short wrap-up of trends in networking leading to the lately popular SDN.

It tries to identify main drivers that led to the current split between data and control plane. One example use-case of an in-car WiFi communication system explains the potential of SDN for the convergence of different fixed and wireless access technologies.

Biography: Dr.-Ing. Hagen Woesner studied computer science in Chemnitz and Berlin and received the diploma and doctoral degree from TUB. For his diploma thesis he worked on the MAC protocols for wireless LANs and contributed to the 802.11 working group. Later on he moved his research interest towards optical packet networks based on arrayed waveguide gratings (AWG). After a post-doc stay at CREATE-NET in Trento until 2006 he moved back to Berlin, where he built up the IT/Infrastructure group of EICT. He is coordinator of the FP7 project OFELIA and worked in the SPARC project on carrier grade extensions to OpenFlow. Recently he chaired the European Workshop on Software-defined Networks (EWSDN).

In 2012 he co-founded a startup called BISDN and is currently managing it together with A. Köpsel.

10:20 – 10:40 Coffee break

10:40 – 12:00 *Oral session 1*

System Analysis and Energy Model of 60GHz Radio-Triggered Wireless Sensor Receiver

Hao Gao (TU/E)

The optimization of a wireless system towards low power performance is not straightforward, it is the combination and trade-offs among different communication layers. In the physical layer, the frequency and the data rate are the fundamental parameters for optimizing power consumption in the wireless communication system. The radio-triggered passive wireless sensor receiver is a solution to achieve a low power radio, enabling a longer lifetime. In this paper, the system level analysis of the radio-triggered passive wireless sensor receiver is provided, including the trade-off between frequency and datarate. On transistor level, the detailed power consumption models of the RF front-end are provided. Based on the analysis, a mm-Wave radio-triggered passive wireless sensor receiver is proposed.

Energy-efficient off-body communication nodes with receive diversity

Patrick Van Torre (UGent)

Off-body wireless communication applications range from fall-detection systems for the elderly to monitoring networks for rescue workers. Further development of practical body-worn systems requires compact, low-cost and low-power battery-powered equipment. A versatile wearable network node offering all these features, including a powerful microcontroller for data processing and additional memory for local data logging was designed and implemented. The node allows receive diversity, mitigating the negative impact of fading, which is typically present in indoor propagation environments. Channel measurements are performed for an indoor Non Line-of-Sight communication between two nodes. Mobile-to-base-station as well as mobile-to-mobile links are considered. A statistical analysis of the performance determines outage

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probability with and without receiver diversity for both link types, showing a significant diversity gain in all cases. Correlation properties, level crossing rate and average fade duration are also determined.

On the effect of movement on the localization accuracy in practical wireless networks
Samuel Van de Velge (UGent)
The problem of localization involves estimating the position of a user from a number of noisy sensor measurements. In a practical wireless network, these sensor measurements cannot be collected instantaneously and some may arrive after a certain delay. In a dynamic scenario where the users move around, this delay may render some measurements out-dated and, if not taken into account, will have a negative effect on the localization performance. This paper consists of two parts, in the first part we investigate the effect of user movement on the measurement models. In the second part we use these models to analyze the impact of movement on the accuracy of the position estimate by means of the Cramer-Rao lower bound (CRLB) which bounds the performance of the estimation.

Smart Constellation Selection for Precise Vehicle Positioning in Urban Canyons using a Software-Defined Receiver Solution
Brian Niehoefer (TU Dortmund)
Positioning techniques based on satellite navigation systems are nowadays standard in most commercial vehicles. But standalone receivers are effected by multipath and atmospheric effects and hence their performance may be decreased, especially in challenging environments that directly affects the usage of satellite-based positioning in traffic-relevant and by that safety-critical systems. Therefore, this paper describes, based on an exemplary implementation of an Advanced Software-Defined radio receiver (ASDR) for Global Navigation Satellite Systems, the impact of the direct receiver surrounding as well as a so-called Smart Constellation Selection (SCS) as pre-positioning routine to increase the accuracy by just using already available data at the receiver side. Beneath the implementation of the receiver itself, the functionality and performance of the SCS will be explained. In addition, this contribution contains the introduction of a freely available database with geo-referenced GPS measurements including web-based analysis functionalities to enable other researches to test and evaluatetheir ideas for future GNSS enhancements.

12:00 - 13:00 Lunch

13:00 - 14:00 *Poster session*

A design of 2.4GHz rectifier in 65nm CMOS with 31% efficiency
Hao Gao (TU/e)

A New Algorithm for Low-Complexity Schedule Construction in Wireless Push Systems
Stathis B.Mavridopoulos (Aristotle University of Thessaloniki)

A Security Protocol with Minimum Interference for UWB and WiFi Networks
Wu Huayi (University of Science and Technology Beijing)
Comparison of two lightweight protocols for smartphone-based sensing
Niccolò De Caro (VUB)

Ensuring Fair Downlink Allocation in Modern Access Network: The XG-PON Framework
Panagiotis Sarigiannidis (University of Western Macedonia)

Joint Source and Channel Decoding of Variable Length Codes Based on Pruned VLC-Block Trellis
Guofang Tu (University of Chinese Academy of Sciences)

Priority-Aware Extended eOCSA Frame Packing Algorithm Evaluation in WiMAX Systems with Mixed VoIP and Data traffic
Keivan Bahmani (Eastern Mediterranean University)

Rules of Thumb for Predicting Path Loss in Body Coupled Communication Channels
Jean-Paul Linnartz (TU/e)

The Performance of the Adaptive Aggregation Mechanism (AAM) in Lossy Wireless Networks
Jianhua Deng (Dublin Institute of Technology)

Visible Light Communications Cooperative Architecture for the Intelligent Transportation System

Alin Cailean (University of Versailles)

14:00 – 14:40 *Keynote Talk*

Machine-to-machine communication

Jesus Alonso-Zarate

CTTC, Spain

The unprecedented communication paradigm of machine-to-machine (M2M), facilitating 24/7 ultra-reliable connectivity between a prior unseen number of automated devices, is currently gripping both industrial as well as academic communities. A vast amount of low-cost, low-energy, and low-complexity automated devices is about to hit the market and technology must be ready for such an entirely connected world. New challenges are thus posed for technology. The vast amount of smart-applications and the new markets that such type of communication will open makes the effort worth it. The aim of this talk is to provide an academic, technical, and industrial overview of key aspects of wireless M2M networks, including both a technology and a market perspective. Key applications will be identified and cellular technologies, wireless sensor networks, low power-WiFi, and new emerging standards for low-power long-range communications technologies will be presented as key pieces to be put together in the design of next generation of networks. Automated devices and humans will need to live together, and technology must be ready for this.

Biography: Jesus Alonso-Zarate – PhD and IEEE Senior Member – received his M. Sc. (with Honors) and Ph. D (Cum Laude) degrees in Telecommunication Engineering from the Universitat Politècnica de Catalunya (UPC, Spain) in March 2004 and February 2009, respectively. In 2005, he was awarded by the National Telecommunication Agency (COIT) of Spain with the Best Master Thesis Award in ICT and in 2011 he received the UPC Award for his PhD thesis. He is now with the CTTC (Barcelona, Spain) holding a Senior Research Associate position and is Head of the M2M Department. He has published more than 80 scientific papers in renowned international journals and international conferences over the last years and has also participated in both European-funded and industrial research projects. He is member of the IEEE ComSoc CSIM Technical Committee (Communication Systems Integration and Modeling) and works as reviewer and chair for numerous international conferences. He is permanent member of the Editorial Board of the IET Wireless Sensor Systems Journal and the Wiley Transactions on Emerging Telecommunication Technologies (ETT), and acts as Guest Editor for a number of Special Issues in telecom related journals. In 2011 he was awarded with the Best Paper Award of IEEE International Conference on Communications (ICC) with a technical contribution towards the energy-efficiency of wireless communications. In 2013, he has been awarded with the 2013 EURASIP Best Paper Award on Advances in Signal Processing. Since 2010, he has been giving a number of invited talks and tutorials on the emerging paradigm of Machine-to-Machine (M2M) communications all around the globe in prestigious international events and conferences, co-speaking with Dr. Mischa Dohler (Chair Professor, King's College London, UK).

14:40 – 15:00 Coffee break

15:00 – 17:00 *Oral session 2*

Effect of Path Loss on Outage Probability in Multi-hop Broadcast Networks

Jean-Paul Linnartz (TU/e)

In very dense networks, the performance of message broadcasting highly depends on the propagation conditions. In this paper, we investigate the effect of the path loss exponent in relation to the carrier sense threshold setting and the traffic intensity. We present a new analysis of the hidden node area in a broadcast network and compare broadcast outage probabilities for various traffic loads and carrier sense ranges. According to our model, the propagation environment (in particular the path loss exponent) has a major influence on performance. The traffic load and carrier sense range also affect throughput. A large attempted traffic load per carrier sense is preferred, since this gives the best performance.

Cell Switching Mechanisms for Access Point Sharing in WLAN over Radio-over-Fiber Systems

Qing Wang (TU/e)

Radio-over-fiber (RoF) technology is a promising candidate to provide high data rates and ubiquitous coverage by distributing small cells over the service area. For wireless LAN (WLAN) application in RoF systems, an access points (AP) can be shared among multiple small cells that are scattered over the entire network. The medium access mechanisms in the distributed coordination function (DCF) under this context encounter some issues due to the carrier sensing failure between the nodes in different cells. For alleviating this problem and also supporting flexible AP sharing, two switching mechanisms are discussed. One employs a time division scheme for sharing the APs and the other is a selective reception of uplink frames among the associated cells. Both approaches are shown to be effective. The proposed mechanisms do not require changes in the existing protocols on both the client side and AP side. And they are complementary to each other due to their different switching principles.

Effects of Imperfect CSIT on Downlink MU-MIMO Fair SLNR Scheduling Algorithm

Diptanil Debbarma (TU/e)

Indoor downlink communication contributes to a large part of the data traffic generated in today's world. The demand for high rate wireless indoor coverage while providing complete support to the existing wireless technologies is a big challenge. The future proof centralized optical fiber indoor backhaul for efficient indoor coverage is gaining a lot of attention recently. Physical layer techniques like multiuser MIMO (MU-MIMO) is becoming an inevitable approach in this regard. Quality of service serves as the most attractive feature that should be ensured among the mobile terminals (MTs). In this work we try to study the effects of imperfections in channel knowledge owing to estimation errors. We study the effects of it on our previously proposed throughput fair successive signal to leakage and noise ratio (SLNR) precoding algorithm for such a fiber-wireless (Fi-Wi) MU-MIMO indoor. Our algorithm has been shown previously to achieve maximal fairness. In this paper we use MMSE alterations to significantly reduce the effect of estimation errors for our scheme. We provide a lower bound on the sum rate achievable with imperfect CSIT. In this paper we also compare different power allocation policies. Power allocation policies plays an important part in improving the performance of the system in terms of BER of the worst case user. We show that channel adaptive power allocation guarantees approximately 3dB SNR improvement over the equal power allocation policy for BER of 10^{-7}.

A Toolkit for Real-time Analysis of Dynamic Large-Scale Networks [INVITED TALK]

Ruud van de Bovenkamp (TU Delft)

Networks are used in many research domains to model the relationships between entities. We present a publicly available toolkit to extract graphs from datasets or data streams and to analyse their properties. The graph extraction is based on a set of rules that define the links between entities in a set or stream of self-contained events involving sets of entities. As the extracted graph is dynamic and, moreover, can be spread over multiple machines, we include the class of gossip algorithms to analyse them. In addition, the toolkit also contains algorithms to compute metrics of static snapshots of the dynamic graph.

17:00 - 17:15 Awards and closure

17:15 Drinks