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WWIC 2007 is organized by the University of Coimbra, Portugal, and it is the fifth event of a series of International Conferences on Wired/Wireless Internet Communications, addressing research topics such as the design and evaluation of protocols, the dynamics of the integration, the performance tradeoffs, the need for new performance metrics, and cross-layer interactions. Previous events were held in Berne (Switzerland) in 2006, Xanthi (Greece) in 2005, Frankfurt (Germany) in 2004 and Las Vegas (USA) in 2002.

As in 2006, WWIC was selected as the official conference by COST Action 290 (Wi-QoS – Traffic and QoS Management in Wireless Multimedia Networks), and Springer accepted to publish the conference proceedings in the LNCS series.

WWIC 2007 brings together active and proficient members of the networking community, from both academia and industry, thus contributing to scientific, strategic, and practical advances in the broad and fast-evolving field of wired/wireless Internet communications.

The WWIC 2007 call for papers attracted 257 submissions from 36 different countries in Asia, Australia, Europe, North America, and South America. These were subject to thorough review work by the Program Committee members and additional reviewers. The selection process was finalized in a Technical Program Committee meeting held in Malaga, Spain, on February 15th, 2007.

A high-quality selection of 32 papers, organized into 8 single-track technical sessions made up the WWIC 2007 main technical program, which covered Transport layer issues, handover and QoS, traffic engineering, audio/video over IP, IEEE 802.11 WLANs, sensor networks,

protocols for ad hoc and mesh networks, and OFDM systems. The technical program was complemented by two keynote speeches, by Henning Schulzrinne (Columbia University, New York, USA) and Nitin H. Vaidya (Department of Electrical and Computer Engineering, and Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, USA), on New Internet and 4G Wireless Networks, and Multi-Channel Wireless Networks, respectively.

In addition to the main technical program, the two days preceding the conference are dedicated to two workshops: the 1st ERCIM workshop on eMobility (<http://www.emobility.unibe.ch/workshop>) and the 1st WEIRD workshop on WiMax, Wireless and Mobility (<http://workshop.ist-weird.eu>).

We wish to record our appreciation of the efforts of many people in bringing about the WWIC 2007 conference: to all the authors that submitted their papers to the conference, regretting that it was not possible to accept more papers; to the Program Committee and to all associated reviewers for their careful reviews; to our sponsors and supporting institutions; to the University of Malaga, for hosting the TPC meeting. Finally, we would like to thank all the people that helped us at the University of Coimbra and all the volunteers from the Laboratory of Communications and Telematics.

May 2007,  
Fernando Boavida  
Edmundo Monteiro  
Saverio Mascolo  
Yevgeni Koucheryavy

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University of Coimbra, Portugal

**Yevgeni Koucheryavy**

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 AUEB, Greece  
**Utz Roedig**  
 University of Lancaster, UK  
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 University of Minho, Portugal  
**Jochen Schiller**  
 Free University Berlin, Germany  
**Andrew Scott**  
 Lancaster University, UK  
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 Kansai University, Japan  
**Chi Zhang**  
 Florida International University, USA  
**Martina Zitterbart**  
 University of Karlsruhe, Germany

# PROGRAM

## MONDAY 21 MAY 2007 1<sup>ST</sup> ERCIM WORKSHOP ON EMOBILITY

- 8.30 Registration
- 9.00 Keynote: Luis M. Correia  
**eMobility: present and future challenges**
- 10.00 coffee break
- 10.30 SESSION 1 – TRAFFIC ENGINEERING AND MOBILITY MANAGEMENT
- Impact of Feedback Channel Delay on Adaptive OFDMA Systems**  
D. Morales-Jiménez, Juan J. Sánchez, G. Gómez, M. Carmen Aguayo-Torres,  
J. T. Entrambasaguas
- Impact of the Variance of Call Duration on Teletraffic Performance  
in Cellular Networks**  
Antonietta Spedalieri, Israel Martin-Escalona, Francisco Barcelo-Arroyo
- Delivering Adaptive Scalable Video over the Wireless Internet**  
Pavlos Antoniou, Vasos Vassiliou, Andreas Pitsillides
- An Experimental Analysis of the Mobile IPv6 Handover Latency Components**  
Vassiliou Vasos, Zinon Zinonos
- 12.30 Lunch
- 13.30 SESSION 2 – WIRELESS (SENSOR) NETWORKS
- Cross-layer performance modeling of wireless channels**  
Dmitri Moltchanov
- Indoor location for safety applications using wireless networks**  
F. Barceló-Arroyo, M. Ciurana, I. Watt, F. Evenou, L. De Nardis, P. Tome
- Improving Unsynchronized MAC Mechanisms in Wireless Sensor Networks**  
Philipp Hurni, Torsten Braun
- A Middleware Approach to Configure Security in WSN**  
Peter Langendoerfer, Steffen Peter, Krzysztof Piotrowski, Renato Nunes,  
Augusto Casaca
- 15.30 coffee break

16.00 SESSION 3 – PERVASIVE COMPUTING AND MOBILE APPLICATIONS

**Context distribution using context aware flooding**

Koen Victor, Julien Pauty, Yolande Berbers

**Coordinating Context-aware Applications in Mobile Ad Hoc Networks**

Jean-Marie Jacquet, Isabelle Linden

**Ubiquitous Sensing for Mobile Service Delivery**

Michael O'Grady, Gregory O'Hare, Natalia Hristova, Stephen Keegan, Conor Muldoon

**A Unified Authentication Solution for Mobile Services**

Håvard Holje, Ivar Jørstad, Do van Thanh

20:00 Workshop Dinner

**TUESDAY 22 MAY 2007**

**1<sup>ST</sup> WEIRD WORKSHOP ON WIMAX, WIRELESS AND MOBILITY**

8.30 Registration

9.00 Welcome Address

Invited Talk I: Seán Murphy, PEL – University College Dublin, IE

**Wireless mesh networks: An Overview**

10.20 Coffee break

10.50 SESSION 1 – WIMAX NETWORKS I

**Preliminary Analysis of the TCP Behavior in 802.16 Networks**

Jesus A. Perez, ITESM, MX

Benoit Donnet, Université Catholique de Louvain, BE

Olivier Bonaventure, Université Catholique de Louvain, BE

**Design and Experimental Evaluation of QoS and Mobility Support  
over Integrated 802.16 Metropolitan and Local Area Networks**

Pedro Neves, Portugal Telecom Inovação, PT

Susana Sargento, Universidade de Aveiro, PT

Rui L. Aguiar, Universidade de Aveiro, PT

**Investigating Depth-Fanout Trade-Off in WiMAX Mesh Networks**

Salim Nahle, Université Pierre et Marie Curie - Laboratoire LIP6/CNRS, FR

Luigi Iannone, Université Catholique de Louvain, BE  
Benoit Donnet, Université Catholique de Louvain, BE  
Timur Friedman, Université Pierre et Marie Curie - Laboratoire LIP6/CNRS, FR

**Transmission of IEEE802.16d WiMAX signals over radio-over-fibre IMDD links**

Francisca Martínez, DAS Photonics, ES  
Jaime Campos, DAS Photonics, ES  
Antonio Ramírez, Nanophotonics Technology Center, ES  
Valentín Polo, Nanophotonics Technology Center, ES  
Alejandro Martínez, Nanophotonics Technology Center, ES  
David Zorrilla, DAS Photonics, ES  
Javier Martí, Nanophotonics Technology Center, ES

12.30 Lunch

14.00 Invited Talk II: Bernd Schröder, Brown-Iposs GmbH, DE  
**Ways to provide triple play for rural areas with WiMAX**

15.00 SESSION 2 – WIMAX NETWORKS II

**Extending WiMAX technology to support End to End QoS guarantees**

Enrico Angori, DATAMAT, IT  
Eugen Borcoci, University Politehnica Bucharest, RO  
Silvano Mignanti, Sapienza, University of Rome, IT  
Cristina Nardini, Sapienza, University of Rome, IT  
Giada Landi, Consorsio Pisa Ricerche, IT  
Nicola Ciulli, Consorsio Pisa Ricerche, IT  
Giacomo Sergio, Consorsio Pisa Ricerche, IT  
Pedro Neves, Portugal Telecom Inovação, PT

**Random Multiple Access in WIMAX: Problems and Solutions**

Alexey Vinel, State University of Aerospace Instrumentation, RU  
Dirk Staehle, University of Würzburg, DE  
Rastin Pries, University of Würzburg, DE

**User capacity based planning tool for Wi-Fi and WiMAX networks**

Pedro Sebastião, Instituto de Telecomunicações/ISCTE, PT  
Fernando Velez, Instituto de Telecomunicações/DEM, University of Beira Interior, PT  
Ricardo Tomé, Instituto de Telecomunicações/ISCTE  
Rui Costa, Instituto de Telecomunicações/DEM, University of Beira Interior, PT  
António Grilo, INESC-ID/IST, PT  
António Rodrigues, Instituto de Telecomunicações/IST, PT  
Francisco Cercas, Instituto de Telecomunicações/ISCTE, PT



**Self-organized Topology Construction and Channel Allocation for Multi-IEEE 802.16-2004 Radio Routers in Disaster Recovery**

Ulrich Fiedler, Swiss Federal Institute of Technology Zurich (ETH Zurich), CH  
Eduard Glatz, University of Applied Sciences Rapperswil (HSR), CH

16.40 Coffee break

17.00 SESSION 3 – ROUTING AND WIRELESS SENSOR NETWORKS

**Distributed Robust Geocast Multicast Routing for Inter-Vehicle Communication**

Harshvardhan P. Joshi, North Carolina State University, US  
Mihail L. Sichitiu, North Carolina State University, US  
Maria Kihl, Lund University, SE

**A Delay-bounded Multi-Channel Routing Protocol for Wireless Mesh Networks**

David Lin, San Jose State University, US  
Teng-Sheng Moh, San Jose State University, US  
Melody Moh, San Jose State University, US

**Low Duty Cycle Traffic Scheduling in IEEE 802.15.4 Wireless Sensor Networks for Industrial Automation**

Hyung Seok Kim, Sejong University, KR

**EGAA: An Efficient GTS Allocation Algorithm of the IEEE 802.15.4 for the Wireless Sensor Networks**

Youngmin Ji, Korea University, KR  
Woojin Park, Korea University, KR  
Sunshin An, Korea University, KR

18.40 Closing Remarks

20.00 Workshop Dinner

**WEDNESDAY 23 MAY 2007**  
**WWIC 2007 CONFERENCE**

8.30 Registration

9.00 Welcome Address: Fernando Boavida, University of Coimbra, PT

Keynote Talk: Henning Schulzrinne, Columbia University, New York, USA  
**Principles and Lessons for a New Internet and 4G Wireless Networks**

10.40 Coffee break

11.00 Keynote Talk: Nitin H. Vaidya, Dep. of Electrical and Computer Engineering, and  
Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, USA  
**Multi-Channel Wireless Networks: Theory to Practice**

12.40 Lunch

14.00 **SESSION 1 – TRANSPORT LAYER ISSUES**  
Chair: Saverio Mascolo, Politecnico di Bari, IT

**TCP Contention Control: A Cross Layer Approach to Improve TCP  
Performance in Multihop Ad hoc Networks**  
Ehsan Hamadani, City University, UK  
Veselin Rakocevic, City university, UK

**Providing Relative Service Differentiation to TCP Flows over Split-TCP  
Geostationary Bandwidth on Demand Satellite Networks**  
Wei Koong Chai, University of Surrey, UK  
Merkourios Karaliopoulos, University of North Carolina, USA  
George Pavlou, University of Surrey, UK

**An Analytical Comparison of the Slow-but-Steady and Impatient Variants  
of TCP NewReno**  
Roman Dunaytsev, Tampere University of Technology, FI  
Konstantin Avrachenkov, INRIA Sophia Antipolis, FR  
Yevgeni Koucheryavy, Tampere University of Technology, FI  
Jarmo Harju, Tampere University of Technology, FI

**SCTP Performance Issue on Path Delay Differential**  
Yuansong Qiao, Athlone Institute of Technology, IE  
Liam Murphy, Performance Engineering Laboratory, IE  
Austin Hanley, School of Engineering, Athlone Institute of Technology, IE  
Enda Fallon, Applied Software Research Center, Athlone Institute of Technology, IE

John Murphy, Performance Engineering Laboratory, University College Dublin, IE  
Xiaosong Zhu, Applied Software Research Center, Athlone Institute of Technology, IE  
Adrian Matthews, Athlone Institute of Technology, IE  
Eoghan Conway, Athlone Institute of Technology, IE  
Gregory Hayes, Athlone Institute of Technology, IE

15.40 Coffee break

16.00 SESSION 2 – HANDOVER AND QoS  
Chair: Rui Aguiar, Universidade de Aveiro, PT

**Handover for Seamless Stream Media in Mobile IPv6 Network**

Yi Liu, Beihang University and Xi'an Jiaotong University, CN  
Mingxiu Li, Xi'an Jiaotong University, CN  
Bo Yang, Xi'an Jiaotong University, CN  
Depei Qian, Beihang University and Xi'an Jiaotong University, CN  
Weiguo Wu, Xi'an Jiaotong University, CN

**A Secure Handover Protocol Design in Wireless Networks with Formal Verification**

Sun-Hee Lim, Korea University, KR  
Ki-Seok Bang, Hallym University, KR  
Okyeon Yi, Kookmin University, KR  
Jongin Lim, Korea University, KR

**Seamless Handover for Multi-user Sessions with QoS and Connectivity Support**

Eduardo Cerqueira, University of Coimbra, PT  
Luis Veloso, University of Coimbra, PT  
Paulo Mendes, NTT DoCoMo Euro-Labs, DE  
Edmundo Monteiro, University of Coimbra, PT

**QoS and authentication experiences in a residential environment within a broadband access framework**

Ivan Vidal, Universidad Carlos III of Madrid, ES  
Francisco Valera, Universidad Carlos III of Madrid, ES  
Jaime Garcia, Universidad Carlos III of Madrid, ES  
Arturo Azcorra, U. Carlos III de Madrid, ES  
Vitor Pinto, Portugal Telecom Inovação, PT  
Vitor Ribeiro, Portugal Telecom Inovação, PT

18.00 Conference Reception

**THURSDAY 24 MAY 2007**  
**WWIC 2007 CONFERENCE**

8.30 Registration

9.00 SESSION 3 – QoS AND TRAFFIC ENGINEERING

Chair: Peter Langendoerfer, IHP Microelectronics, DE

**Security and Service Quality Analysis for Cluster-Based Wireless Sensor Networks**

Emrah Tomur, Middle East Technical University, TR

Y. Murat Erten, TOBB Economy and Technology University, TR

**Admission Control for Inter-domain Real-time Traffic Originating  
from Differentiated Services Stub Domains**

Stylianos Georgoulas, University of Surrey Guildford, UK

George Pavlou, University of Surrey Guildford, UK

Panos Trimintzios, ENISA, EU, Heraklion, Crete, GR

Kin-Hon Ho, University of Surrey Guildford, UK

**Fault Tolerant Scalable Support for Network Portability and Traffic Engineering**

Marcelo Bagnulo, Huawei Labs at UC3M, ES

Alberto García-Martínez, U. Carlos III de Madrid, ES

Arturo Azcorra, U. Carlos III de Madrid, ES

**Class-based OSPF Traffic Engineering inspired on Evolutionary Computation**

Pedro Sousa, University of Minho, PT

Miguel Rocha, University of Minho, PT

Miguel Rio, University College London, UK

Paulo Cortez, University of Minho, PT

10.40 Coffee break

11.00 SESSION 4 – AUDIO/VIDEO OVER IP

Chair: Alexandre Santos, Universidade do Minho, PT

**An Experimental Investigation of the Congestion Control Used by Skype VoIP**

Luca De Cicco, Dipartimento di Elettronica ed Elettrotecnica, Politecnico di Bari, IT

Saverio Mascolo, Dipartimento di Elettronica ed Elettrotecnica, Politecnico di Bari, IT

Vittorio Palmisano, Dipartimento di Elettronica ed Elettrotecnica, Politecnico di Bari, IT

**A Quality Adaptation Scheme for Internet Video Streams**

Panagiotis Papadimitriou, Demokritos University, GR

Vassilis Tsaoussidis, Demokritos University, GR

**Performance evaluation of VoIP over HSDPA in a multi-cell environment**

Irene de Bruin, Twente Institute for Wireless and Mobile Communications, NL  
Frank Brouwer, Twente Institute for Wireless and Mobile Communications, NL  
Neill Whillans, Twente Institute for Wireless and Mobile Communications, NL  
Yusun Fu, Huawei Technologies Co., Shanghai, CN  
Youqian Xiao, Huawei Technologies Co., Shanghai, CN

**Feasibility of Supporting Real-time Traffic in DiffServ Architecture**

Jinoo Joung, Sangmyung Univ., KR

12.40 Lunch

14.00 SESSION 5 – IEEE 802.11 WLANS

Chair: Guevara Noubir, Northeastern University, USA

**Multi-rate relaying for performance improvement in IEEE 802.11 WLANS**

Laura Feeney, SICS, SE  
Bilge Cetin, SICS, SE  
Daniel Hollos, Technical University Berlin, DE  
Martin Kubisch, Technical University Berlin, DE  
Seble Mengesha, Technical University Berlin, DE  
Holger Karl, University of Paderborn, DE

**Performance Analysis of IEEE 802.11b under Multiple IEEE 802.15.4 Interferences**

DaeGil Yoon, Samsung Electro-Mechanics, KR  
Soo Young Shin, Seoul National University, Seoul, KR  
Jae Hee Park, Samsung Electro-Mechanics, Gyeonggi, KR  
Hong Seong Park, Kangwon National University Chuncheon, Kangwon-Do, KR  
Wook Hyun Kwon, Seoul National University, Seoul, KR

**Characterization of service times burstiness of IEEE 802.11 DCF**

Francesco Vacirca, University of Roma La Sapienza - INFOCOM Dept., IT  
Andrea Baiocchi, University of Roma La Sapienza - INFOCOM Dept., IT

**ID-based Multiple Space Key Pre-distribution Scheme for Wireless Sensor Networks**

Thanh Dai Tran, Kyung Hee University, KR  
Choong Seon Hong, Kyung Hee University, KR

15.40 Coffee break

16.00 SESSION 6 – SENSOR NETWORKS AND LOCATION-AWARE SYSTEMS

Chair: Vassilis Tsaoussidis, Demokritos University, GR

**Distributed event localization and tracking with wireless sensors**

Wälchli Markus, University of Bern, CH

Piotr Skoczylas, School of Computer and Communication Sciences EPFL, CH

Michael Meer, University of Bern, CH

Torsten Braun, University of Bern, CH

**Cross-Layer Distributed Diversity for Heterogeneous Wireless Networks**

Guevara Noubir, Northeastern University, USA

Yin Wang, Northeastern University, USA

Hooman Javaheri, Northeastern University, USA

**An Enhanced Location-aware Signaling Protocol for WWAN  
and WLAN Interworking**

SungHoon Seo, Yonsei University, KR

SuKyoung Lee, Yonsei University, KR

JooSeok Song, Yonsei University, KR

**Performance evaluation of non-persistent CSMA as anti-collision protocol  
for active RFID tags**

Esteban Egea-Lopez, Polytechnic University of Cartagena, ES

J. Vales-Alonso, Polytechnic University of Cartagena, ES

A. S. Martinez-Sala, Polytechnic University of Cartagena, ES

M. V. Bueno Delgado, Polytechnic University of Cartagena, ES

J. Garcia-Haro, Polytechnic University of Cartagena, ES

19.30 Conference Dinner

**FRIDAY 25 MAY 2007  
WWIC 2007 CONFERENCE**

8.45 Registration

9.00 SESSION 7 – PROTOCOLS FOR AD HOC AND MESH NETWORKS

Chair: Torsten Braun, University of Bern, CH

**Multicast Overlay Spanning Tree Protocol for Ad Hoc Networks**

Georgios Rodolakis, INRIA Rocquencourt, FR

Amina Meraihi Naimi, INRIA Rocquencourt, FR

Anis Laouiti, INRIA Rocquencourt, FR

**Detection of Packet Forwarding Misbehavior in Mobile Ad-Hoc Networks**

Oscar Fredy Gonzalez Duque, University of Surrey, UK

Michael Howarth, University of Surrey, UK

George Pavlou, University of Surrey, UK

**Reliable Geographical Multicast Routing in Vehicular Ad-hoc Networks**

Maria Kihl, Lund University, SE

Mihail Sichitiu, North Carolina State University, USA

Ted Ekeroth, Lund University, SE

Michael Rozenberg, Lund University, SE

**A Flexible Tree-based Routing Protocol with a Mesh Relaying Node  
in Multi-hop Wireless Mesh Networks**

Hyun-Ki Kim, Sungkyunkwan Univ., KR

10.40 Coffee break

11.00 SESSION 8 – EFFICIENT SPECTRUM USE

Chair: Edmundo Monteiro, University of Coimbra, PT

**An Interference-Robust Transmission Method for OFDMA Uplink**

Ki-Chang Lee, Hoseo University, KR

Tae-Hyun Moon, Aheadcomm Inc., KR

**An Efficient Heterogeneous Wireless Access based on Region  
and Time Partitioning in Dynamic TDD OFDM Systems**

Nak-Myeong Kim, Ewha Women's University, KR

Hee-Jeong Chung, Ewha Women's University, KR

Mee-Ran Kim, Ewha Women's University, KR

Yeon-Joo Kang, Ewha Women's University, KR

**Cognitive Radio based Bandwidth Sharing among Heterogeneous  
OFDM Access Systems**

Mee-Ran Kim, Ewha Women's University, KR

Eun-Ju Kim, Ewha Women's University, KR

Yeon-Joo Kang, Ewha Women's University, KR

Nak-Myeong Kim, Ewha Women's University, KR

**A Predictive Power Control for CDMA Systems over Time-Varying Rayleigh  
Fading Channels**

Sangho Choe, The Catholic University of Korea, KR

12.40 Closing Remarks

Edmundo Monteiro, University of Coimbra, PT

13.00 Lunch

# KEYNOTE TALKS

**Prof. Henning Schulzrinne**

Columbia University, New York, USA

## Principles and Lessons for a New Internet and 4G Wireless Networks

### Abstract

In the last few years, there has been a lot of discussion on “blank slate” designs and moving from third-generation wireless to a somewhat ill-defined 4G network. These discussions reflect a frustration with the current state of networking technology and the inability to effect change via networking research. In this talk, I’ll present a highly biased summary of some of the challenges and lessons as we move towards researching, planning and implementing next-generation networks. In particular, it is instructive to look at why certain promising networking technologies have failed to take off in the past and which key ideas should be fundamental going forward.

### Short biography

Prof. Henning Schulzrinne received his undergraduate degree in economics and electrical engineering from the Darmstadt University of Technology, Germany, his MSEE degree as a Fulbright scholar from the University of Cincinnati, Ohio and his Ph.D. degree from the University of Massachusetts in Amherst, Massachusetts. He was a member of technical staff at AT&T Bell Laboratories, Murray Hill and an associate department head at GMD-Fokus (Berlin), before joining the Computer Science and Electrical Engineering departments at Columbia University, New York. He is currently chair of the Department of Computer Science.

He is editor of the “IEEE/ACM Transactions on Networking”, the “ACM Transactions on Multimedia Computing” and the “ComSoc Surveys & Tutorials” and former editor of the “IEEE Internet Computing Magazine”, “IEEE Transactions on Image Processing” and “Journal of Communications and Networks”.

He has been a member of the Board of Governors of the IEEE Communications Society and the ACM SIGCOMM Executive Committee, former chair of the IEEE Communications Society Technical Committees on Computer Communications and the Internet and has been technical program chair of Global Internet, Infocom, NOSSDAV and IPtel and was General Chair of ACM Multimedia 2004. He also was a member of the IAB (Internet Architecture Board).

Protocols co-developed by him are now Internet standards, used by almost all Internet telephony and multimedia applications. His research interests include Internet multimedia systems, quality of service, and performance evaluation.

He serves as Chief Scientist for FirstHand Technologies and as former Chief Scientific Advisor for Ubiquity Software Corporation. He is a Fellow of the IEEE, has received the New York City Mayor’s Award for Excellence in Science and Technology, the VON Pioneer Award.



**Prof. Nitin H. Vaidya**

Department of Electrical and Computer Engineering, and Coordinated Science Laboratory,  
University of Illinois at Urbana-Champaign, USA

## **Multi-Channel Wireless Networks: Theory to Practice**

### **Abstract**

Wireless technologies, such as IEEE 802.11, provide for multiple non-overlapping channels. With the availability of multiple channels, network capacity may be increased by using all the available channels within a given network. However, the number of interfaces per node in a network is expected to be typically much smaller than the number of channels, and therefore a single node cannot simultaneously use all the channels.

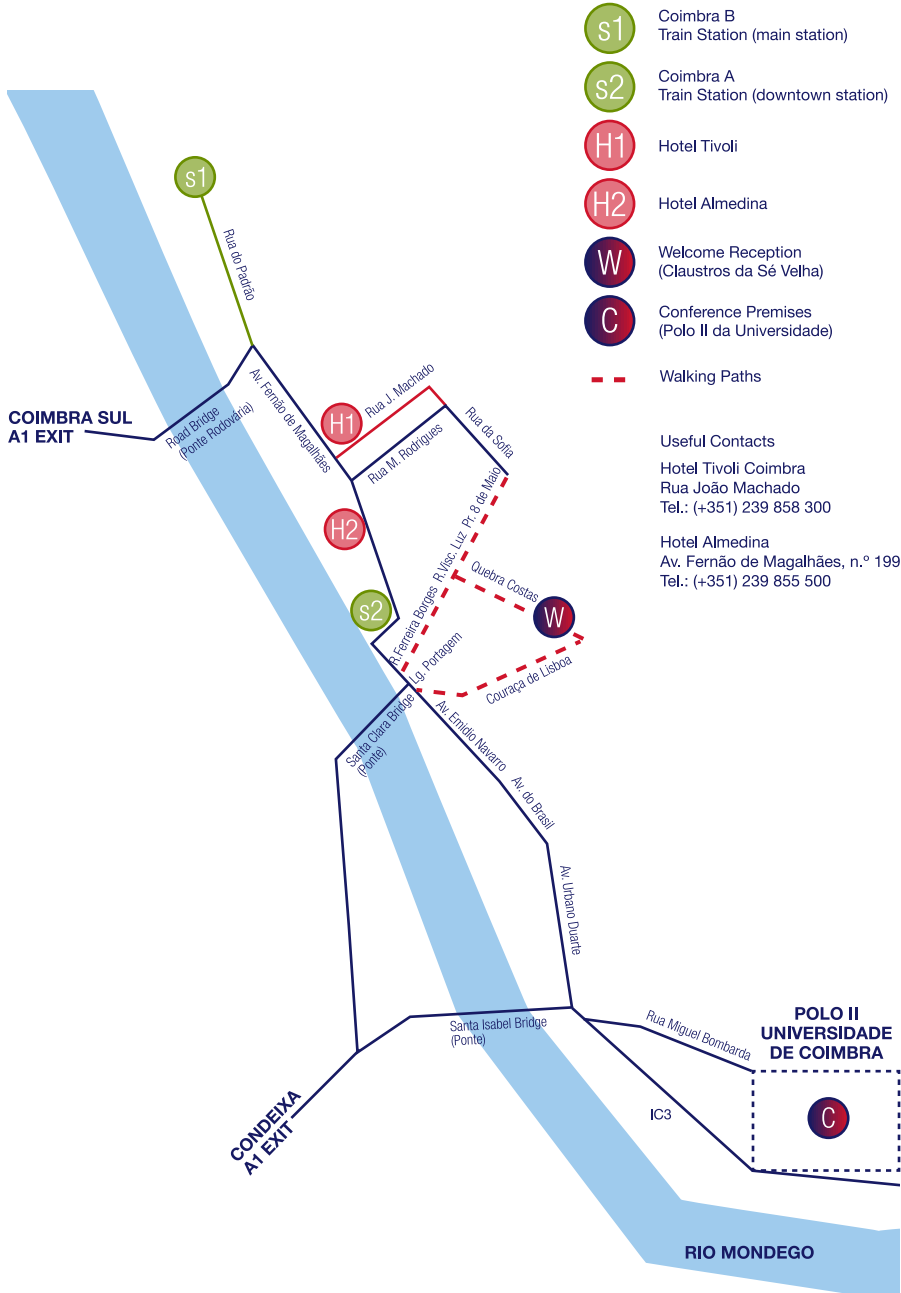
In this talk, we present capacity results for multi-channel wireless networks, considering constrained as well as unconstrained channel assignments. In the constrained channel assignment scenario, we show that for a random network of  $n$  nodes using just one interface each, asymptotically, there is no capacity degradation so long as the number of channels is  $O(\log n)$ .

The capacity results indicate that, in theory, multiple channels can be used within a single network to improve network capacity significantly, even with a small number of interfaces per node. However, in practice, many challenges have to be addressed before the capacity improvement can be realized. This talk will present the insights obtained from the capacity analysis, which are useful in designing practical multi-channel protocols for wireless mesh and ad hoc networks, and also discuss some of the design decisions made while implementing the Net-X multi-channel multi-interface testbed at the University of Illinois.

This talk is based on joint research with graduate students Vartika Bhandari, Rishi Bhardwaj, Chandrakanth Chereddi, Pradeep Kyasanur and Nistha Tripathi.

### **Short biography**

Nitin Vaidya received Ph.D. from the University of Massachusetts at Amherst. He is presently a Professor of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign. He has held visiting positions at Microsoft Research, Sun Microsystems and the Indian Institute of Technology-Bombay. His current research is in wireless networking and mobile computing. He co-authored papers that received awards at 1998 ACM MobiCom and 2003 Personal Wireless Communications (PWC) conferences. Nitin is a recipient of a CAREER award from the National Science Foundation. He served as program co-chair for 2003 ACM MobiCom and General Chair for 2001 ACM MobiHoc, and presently serves as the Editor-in-Chief for the IEEE Transactions on Mobile Computing. For more information, please visit <http://www.crhc.uiuc.edu/wireless/>.



**Useful Contacts**

Hotel Tivoli Coimbra  
 Rua João Machado  
 Tel.: (+351) 239 858 300

Hotel Almedina  
 Av. Fernão de Magalhães, n.º 199  
 Tel.: (+351) 239 855 500

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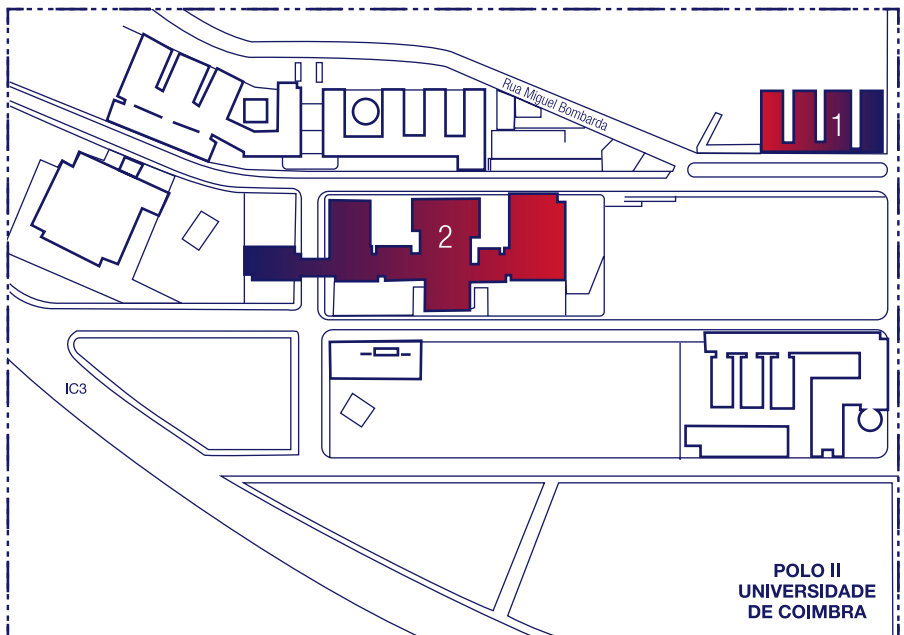
**FCTUC/UPC**

ERCIM Workshop (May 21)  
WEIRD Workshop (May 22)  
COST 290 Meeting (May 22)  
Coffee-breaks (May 21-22)  
Lunch (May 21-25)

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**Departamento de Engenharia Civil**

WWIC 2007 Conference (May 23-25)  
Coffee-Breaks (May 23-25)



## CONFERENCE LOGISTICS

### ROOM ASSIGNMENTS

#### **WWIC 2007: Keynotes & Technical Sessions**

Main Auditorium (FCTUC/UPC)

#### **Workshops**

Auditório Laginha Serafim

(Dep. de Engenharia Civil)

#### **COST 290 Meeting**

Anfiteatro C (FCTUC/UPC)

### LUNCHES

Lunches will be served at FCTUC/UPC

(close to the Main Auditorium).

### WIRELESS INTERNET

SSID: guest-e-U (web-based authentication)

Username/Password: wwic@uc / wwic2007

Available services: HTTP, HTTPS, POP3S, IMAPS, SMTP

### TAXIS

You may ask the local organization to call a Taxi for you or phone the local Taxi Service (Politáxis, 239 499 090).

## SOCIAL PROGRAM

### **Dinner of the 1<sup>st</sup> ERCIM Workshop**

Monday Evening

The ERCIM Workshop dinner will be held at Restaurante Nacional, less than 200 m from the Hotel Tivoli and Hotel Almedina.

Address

*Restaurante Nacional, R. Mário Pais, 12, 1<sup>o</sup>*

### **Dinner of the 1<sup>st</sup> WEIRD Workshop**

Tuesday Evening

The WEIRD Workshop dinner will be held at Restaurante Gauchão. A taxi is best way to reach the Restaurant, from the Conference Hotels (it should take around 5 minutes and cost around 5 Euro).

Address

*Rest. Gauchão, Av. Elísio Moura, Atrium Solum*

### **Welcome Reception**

Wednesday Evening

The Welcome Reception will be held in the cloisters of the Sé Velha. Before the Reception, a guided tour will give you the opportunity to visit the old University Campus and some of the oldest streets of Coimbra.

### **Conference Banquet**

Thursday Evening

The Conference Banquet will be held at Palácio de São Marcos, 20 km away from Coimbra. Buses will depart from the Hotels to “São Marcos” around 19h30. If you prefer to drive, ask the local organization for directions.