2010 Australasian Telecommunication Networks and Applications Conference

(ATNAC 2010)

Auckland, New Zealand
31 October – 3 November 2010

Program

08:00 - 08:45

D1Reg: Registration

08:45 - 09:10

D1Opening: Opening Session

09:10 - 10:00

D1IT: Invited talk: Prof. Stefan Fischer

Experimental Facilities for Wireless Sensor Networks - the European WISEBED approach

Abstract: Sensor network technology has been under investigation for several years now and has matured to a degree which allows for commercial real-world implementations at a large scale. Before taking the step to deployment, however, it is crucial to evaluate the system, because detecting faults during runtime is extremely costly especially for sensor networks - just imagine re-accessing an installation which has been deployed in a jungle or under water. While simulations have been an important evaluation tool for sensor network technology for a long time, it has also become clear that achieving results that reflect the reality to a high degree is extremely difficult. It will thus be of major importance to do real experiments with systems and applications just implemented before deploying it. For that reason, multipurpose testbeds are required, which allow testing of different aspects of a sensor network system, such as scalability, mobility, support for heterogeneity etc. The European project WISEBED is currently creating such a testbed by building a federation of several existing physical sensor networks throughout the world. In this talk, we'll present the general idea and structure of WISEBED and highlight specific features, such as wireless links which are an important means to create flexible and powerful experimentation environments.

Biography: Dr. Stefan Fischer is a professor for computer science at the University of Luebeck in Germany, and the director of the Institute for Telematics. There, he teaches courses in fields related to computer networks and distributed systems and applications. He received a doctoral degree in computer science from the University of Mannheim, Germany, in 1996. After a postdoctoral stay in Montreal, he held professor positions at the International University in Germany and the Technical University of Braunschweig. The focus of his research group (10 researchers) is on communication and application development in modern network environments, such as sensor networks.

10:00 - 10:30

D1MB: Morning break

10:30 - 12:10

D1S1T1: Wireless Sensor Networks 1

Protocols and Case Studies

Distributed Data Sharing in Mobile Ad Hoc Networks
  Therence Houngbadji (LICEF Research Center, Canada)
  pp. 1-6

Linear and Non-Linear Strategies for Power Mapping in Gaussian Sensor Networks
  Franco R Davoli (University of Genoa, Italy); Mario Marchese (DIST- University of Genoa, Italy); Maurizio Mongelli (CNIT - University of Genoa, Italy)
  pp. 7-12

RSS-Based Localization with Different Antenna Orientations
  B Dil (Pervasive Systems, University of Twente, The Netherlands); Paul Havinga (University of Twente, The Netherlands)
  pp. 13-18

Field Experiments for Developing Transmission Control Based on Weather Estimation in an Environmental Wireless Sensor Network
  Kohta Ohshima (Tokyo University of Agriculture and Technology, Japan); Hiroshi Hara (Tokyo University of Agriculture and Technology, Japan); Yoichi Hagiwara (Tokyo University of Agriculture and Technology, Japan); Matsuaki Terada (Tokyo University of Agriculture and Technology, Japan)

12:10 - 13:30

D1LB: Lunch break

13:30 - 15:10

D1TU: Wisebed Tutorial - Dr. Stefan Fischer, Dr. Dennis Pfisterer

Sensor network technology has been under investigation for several years now and has matured to a degree which allows for commercial real-world implementations at a large scale. Before taking the step to deployment, however, it is crucial to evaluate the system, because detecting faults during runtime is extremely costly especially for sensor networks. While simulations have been an important evaluation tool for sensor network technology for a long time, it has also become clear that achieving results that reflect the reality to a high degree is extremely difficult. It will thus be of major importance to also test a system just implemented before deploying it.

There is variety of hardware and software to choose from, and almost all of them are easy to set up and use. Still there is a major issue that has not been sufficiently addressed in the past. The sensor node brands are very different in their capabilities. Consequently, the software running on these systems is very different on the various nodes. Where algorithms are implemented, they are hard to share and compare, as implementations cannot be easily ported to new platforms.

To address the aforementioned challenges, the European project WISEBED (http://www.wisebed.eu) provides

- an infrastructure of interconnected, heterogeneous testbeds of large-scale wireless sensor networks for research purposes,
- software (Wiselib) for implementing applications for heterogeneous sensor networks, and • a language (WiseML) for describing and executing experiments as well as for storing traces of such experiments.

WISEBED is open for everybody (absolutely not restricted to Europe) and represents a powerful platform for large-scale experimentation. The goal of this tutorial is to familiarize the participants with the WISEBED testbed federation, the Wiselib, and WiseML.

In the first session, we will

- introduce the architecture of the WISEBED testbed federation,
- present WiseML and show how run experiments (including description of experiments, access the testbed, executing an experiment, and collecting its results), and
- introduce the concepts and architectural details of the Wiselib, which is a generic algorithms library written in C++ that runs on a simple interfaces to the algorithm developer, with a unified API and ready implementations.

Second, in a hands-on session, attendees will

- implement a WSN application
- deploy it on heterogeneous hardware of the WISEBED testbed federation,
- and collect the results in WiseML.

Course prerequisites:

- To avoid installation of compilers and tools, participants will use a virtual machine image containing a complete development environment. Participants should have a PC with a working installation of VirtualBox (http://www.virtualbox.org/) or VMWare Player (http://www.vmware.com/products/player/) and about 2 GB of free disk space.
- Attendees are expected to have knowledge of WSN programming in general and the C++ programming language.

Teachers

The tutorial will be given by Dr. Dennis Pfisterer and Prof. Dr. Stefan Fischer, both from the University of Lübeck, Germany. While Stefan Fischer is the administrative coordinator of WISEBED, Dennis Pfisterer acts as the technical manager.

D1S2T1: Internet 1

Architectures and Topologies

A New Topological Index for Capacity Allocation Problem in Survivable Networks
William Liu (Auckland University of Technology, New Zealand); Harsha Sirisena (University of Canterbury, New Zealand); Krzysztof Pawlikowski (University of Canterbury, New Zealand); Andreas Willig (University of Canterbury, New Zealand)

Heuristics for Dynamic Topologies to Reduce Power Consumption of Networks
Abdelnour Aldraho (University of Southern Queensland, Australia); Alexander A. Kist (University of Southern Queensland, Australia)

Theoretical and Technological Limitations of Power Scaling in Network Devices
Raffaele Bolla (University of Genoa, Italy); Roberto Bruschi (CNIT, Italy); Alessandro Carrega

(University of Genoa, Italy); Franco R Davoli (University of Genoa, Italy)
pp. 37-42

Network Functional Composition: State of the Art
Christian Henke (Technical University Berlin, Germany); Abbas Siddiqui (University of Kaiserslautern, Germany); Rahamatullah Khondoker (University of Kaiserslautern, Germany)
pp. 43-48

15:30 - 16:10

D1IT: Invited talk: Dr. An Vu Tran

Australia's National Broadband Network: Beyond the 90%

Abstract: The Australian Federal Government has committed to building a National Broadband Network (NBN) that will provide 100 Mbit/s fibre access to 90% of the population. The remaining 10% will be serviced by a 12 Mbit/s wireless/satellite access network. To fulfil this promise, the NBN will have to provide fibre coverage to all major cities, their surrounding urban areas and many large rural towns across the nation. In this paper we discuss some of the technological and cost issues that will arise with this endeavour. We also consider the possibility of extending the fibre reach beyond the 90% target.

Biography: Dr. An Vu Tran received the PhD in engineering from the University of Melbourne. He had worked as a researcher and project manager at the ARC Special Research Centre for Ultra-Broadband Information Networks (CUBIN), the University of Melbourne responsible for long-haul WDM system study. Dr. Tran had also been a project manager for an Australian Research Council Linkage Project to develop next-generation optical access networks for rural and remote areas. He is currently the Research Group Manager at Victoria Research Lab, National ICT Australia (NICTA), in charge of Networked Systems group. His research interests include broadband access networks, systems and subsystems.

15:30 - 17:30

D1TU: Wisebed Tutorial Continued

16:10 - 17:30

D1S3T1: Optical Communications 1

Optical Communications Session 1

Traffic Analysis and Network Protection in Photonic Switched Optical Metro-Access Networks
Indayara Martins (Unicamp, Brazil); Felipe Rudge Barbosa (University of Campinas -- Unicamp, Brazil); Edson Moschim (State University of Campinas - Unicamp, Brazil)
pp. 49-54

Spectrally-Efficient 100 Gb/s Transmission in Next-Generation Optical Access Networks Employing Directly Detected Optical-OFDM
Lenin Mehedy (University of Melbourne, Australia); Masuduzzaman Bakaul (NICTA Victoria Research Laboratory, Australia); Thas Nirmalathas (University of Melbourne, Australia)
pp. 55-59

Evaluation Of Modified Degree 5 Chordal Rings for Network Topologies
Bujnowski (University of Technology and Life Sciences, Bydgoszcz, Poland); Dubalski (University of Technology and Life Sciences, Bydgoszcz, Poland); Zabludowski (University of Technology and Life Sciences, Bydgoszcz, Poland); Ledzinski (University of Technology and Life Sciences, Bydgoszcz, Poland); Tahir M Riaz (Aalborg University, Denmark); Jens M. Pedersen (Aalborg University, Denmark)
pp. 60-65

18:00 - 20:00

D1CR: Conference reception

Tuesday, November 2

08:30 - 09:15

D2IT: Invited talk: Prof. Rudolf Mathar

Conventional, less conventional and optimum signalling

In conventional modulation, blocks of bits are mapped onto complex symbols which jointly with a pulse shaping function determine the baseband signal. Regular patterns on a circle (phase-shift keying) or on a grid (quadrature amplitude modulation) are usually preferred in order to keep the receiver complexity low. The distribution which governs the selection of signalling points is not considered in this approach. In this talk we first derive capacity achieving input distributions which strongly depend on the noise distribution. Finally, optimum signalling means not only to optimize the input distribution but also to select the position of signalling points in a bounded n-dimensional set such that channel capacity is maximized. Boundedness refers to the fact that besides possible average power constraints also peak power constraints apply, a requirement obviously needed for practical applications. We present some recent results on this problem which show that increasing transmission power not necessarily increases channel capacity.

Biography: Rudolf Mathar received his Diploma and Ph.D. degree in mathematics from RWTH Aachen University in 1978 and 1981, respectively. Previous positions include a research fellowship at Augsburg University and a lecturer position at the European Business School. In 1989, he joined the Faculty of Natural Sciences at RWTH Aachen as a Professor of Stochastics and Computer Science. He has held the International IBM Chair in Computer Science at Brussels Free University in 1999. In spring 2001 and 2008, he was invited as Erskine Fellow to Canterbury University, Christchurch, New Zealand.

In 2002, he was the recipient of the prestigious Vodafone D2 Innovation Award. In 2004 he was appointed head of the Institute for Theoretical Information Technology in the Faculty of Electrical Engineering and Information Technology at RWTH Aachen University. His research interests include mobile communication systems, particularly optimization, resource allocation and access control, as well as radio network information theory.

From 2005 to 2009 he was associate editor for Information Theory of the European Transactions on Telecommunications (ETT). He serves on the editorial board of the International Journal of Mobile Network Design and Innovation. He is presently chairman of ITG/VDE Technical Committee 5.1, Information and System Theory. He is co-founder of two spin-off enterprises in the area of communications and publishes extensively in IEEE journals and conferences.

09:15 - 10:00

D2IT: Invited talk: Prof. Phuoc Tran-Gia

Federation Issues in Experimental Facilities for Future Internet Research

Abstract: Currently, we are witnessing fast-moving activities towards next generation network. A number of experimental facilities are initiated in several countries, e.g in the US, EU, Japan etc. The talk will present basic approaches and contributions of the project German-Lab (G-Lab), which is funded by the German Federal Ministry of Research and Education (BMBF). This project is aiming to build a cluster in Germany to foster experimentally driven research to exploit future internet technologies. Current activities and problems in the course of federating those experimental platforms will also be addressed.

Biography: Phuoc Tran-Gia is professor and director of the Institute of Computer Science, and currently Dean of the Faculty of Mathematics and Computer Science, the University of Wuerzburg, Germany. Previously he was at academia in Stuttgart, Siegen (Germany) as well as industries at Alcatel and IBM Zurich Research Laboratory (Zurich, Switzerland). Professor Tran-Gia was active in several management committees of European research projects (COST, NoE and STREP). He is also founding director of the multi-university Nortel's "Center of Network Optimization". He is consultant and cooperation project leader with Siemens (Munich, Berlin), Nortel (Texas), T-Mobile International (Bonn), France Telecom/Orange Group (Belfort), Datev (Nuremberg), Bosch (Stuttgart). Prof. Tran-Gia published 2 books and around 100 papers in international journals, seminars and workshops. His current research areas include architecture and performance analysis of communication systems, and planning and optimization of communication networks. He currently works with the European Union authorities and the German Ministry of Research and Education on funding strategies and initiatives towards Next Generation Internet. He is coordinator of the project German-Lab (G-Lab), which ia funded by BMBF, aiming to foster experimentally driven research to exploit future internet technologies.

10:00 - 10:30

D2MB: Morning break

10:30 - 12:10

D2TU: Panel Session - Performance of Future Internet Architecture

Performance Issues in Future Internet Architectures -- Myths and Realities The background of the topic is found in recent discussions at Future Internet Cluster Workshops (organized by the European Network of Excellence Euro-NF on behalf of the European Commission) on the properties of future internet architectures, such as issues of isolation and transparency. In particular, questions arose to which extend the fact that a resource is virtual becomes visible to the end user, how performance of future architectures can be evaluated (through experimentation, measurements, simulations, and performance modeling and analysis), and which experience is so far available in the domain. This panel discussion will try to shed light on approaches and insights to performance issues in future internet architectures. Members: Nevil Brownlee, University of Auckland, NZ Krys Pawlikowski, University of Canterbury, NZ Max Ott, NICTA, AU Phuoc Tran-Gia, University of Würzburg, DE Organiser: Markus Fiedler, Blekinge Institute of Technology, SE; Euro-NF

D2S1T1: Mobile and Wireless Networks 1

Joint Resource Allocation and Sensing Scheduling for Cognitive Ultra Wideband

Norazizah Mohd Aripin (Universiti Teknologi Malaysia, Malaysia); Rozeha A. Rashid (Universiti Teknologi Malaysia, Malaysia); Norsheila Fisal (Universiti Teknologi Malaysia, Malaysia); Liza A. Latiff (University Technology Malaysia, Malaysia); Sharifah Hafizah Syed Ariffin (Universiti Teknologi Malaysia, Malaysia); Sharifah K. Syed-Yusof (Universiti Teknologi Malaysia, Malaysia); Anthony Lo (Delft University of Technology, The Netherlands); Mohd Adib Sarijari (Universiti teknologi Malaysia, Malaysia)

pp. 66-71

Analysis of Opportunistic Contention-Based Feedback Protocol for Downlink OFDMA

Kumbesan Sandrasegaran (University of Technology, Sydney, Australia); Rachod Patachaianand (University of Technology Sydney, Australia); Faisal Madani (University of Technology Sydney, Australia); Cheng-Chung Lin (University of Technology Sydney, Australia)

pp. 72-77

12:10 - 13:30

D2LB: Lunch break

13:30 - 14:10

D2IT: Invited talk: Prof. Chan-Hyun Youn

Metabolic Syndrome Estimation with High Precision Sensing Unit

Abstract: We discuss sensor-integrated system model for metabolic syndrome estimation with workflow management system, which measures a temperature variation using invasive method, which is able to produce an accurate result of measurement through compensation of a measurement result and environment via simulation. Moreover, we discuss metabolic syndromes prediction technology based on measurement of mitochondrial activity by using high precision sensing system and integrated simulation model of human energetic with high performance workflow computing platform. To identify metabolic syndrome, we will build a sensor integrated chamber that has network interface to deliver analysis results of human cells, annotation data from public hospital, and metabolic data. Using our heat metabolism measuring system, we can evaluate functionality of human mitochondria and analyze energy metabolism.

Biography: Chan-Hyun Youn received BS and MS degrees in Electronics Engineering from Kyungpook National University, Taegu, Korea, in 1981 and 1985, respectively. He also received a Ph.D. in Electrical and Communications Engineering from Tohoku University, Japan, in 1994. He served at Korean Army as a communications officer, First Lieutenant, from 1981 to 1983. Before joining the University, from 1986 to 1997, he was the leader of high-speed networking team at Korea Telecom (KT) Telecommunications Network Research Laboratories. Where he had been involved in the research and developments of Centralized Switching Maintenance System (CSMS), Maintenance and Operation system for Various ESS`s (MOVE) system, high-speed networking, and HAN/B-ISDN network testbed. Especially, he was a principal investigator of high-speed networking projects including ATM technical trial between KT and KDD, Japan, Asia-Pacific Information Infrastructure (APII) testbed, Korea Research and Education Network (KOREN) and Asia-Pacific Advanced Network (APAN), respectively. In 1997, he joined Information and Communications University (ICU) where he was a dean of office of planning affairs and a director of research and industrial cooperation group in 2006 and 2007, respectively. He also was a visiting professor at MIT in 2003 and has been engaged in the development of Physio-Grid system with Prof. R.G. Mark`s group in LCP (Laboratory for Computational Physiology) of MIT since 2002. He was a Director of Grid Middleware Research Center, ITRC (IT Research Center) of MKE (Ministry of Knowledge Economy) and was a vice president of Grid Forum Korea. In the ITRC center, he has been engaged in development of the Policy Quorum-based Grid middleware for QoS-constrained applications and Physio-Ubiquitous Grid system for e-Healthcare. Since 2009, he has been a professor at Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea. He is serving for the technical program committees in many international conferences. Currently, he is interested in the Grid computing, Cloud, computing middleware, advanced e-Healthcare system and application services, network management, and advanced network systems. He was a recipient of IEICE PAACS friendship prize, Japan, in 1994. Now, he is an editor-in-chief of Korea Information Processing Society (KIPS) and a member of IEEE, KICS, KIPS, and IEICE, respectively.

13:30 - 15:10

D2TU: Tutorial - Introduction to NGN and Future Networks - Prof Dr Koichi Asatani

Introduction to NGN and Future Networks

Abstract: Next Generation Network (NGN) is designed to be capable of QoS management and controls like in traditional telecommunication networks and to support economical, versatile multi-media applications like those on the current Internet. NGN also provides fixed-mobile convergence (FMC) with generalized mobility, and horizontal and vertical roaming as well as improved security. The concepts and architecture of the Next Generation Networks (NGN) are described. NGN voice and Internet services are attractive from the view points of service flexibility and cost effectiveness and the capability of integrating third-party applications with high dependability and high security. The current status of NGN implementation in a commercial offer by NTT (Nippon Telegraph and Telephone Corporation) is touched upon. Issues for the global evolution of NGN are also described, such as technical key issues, global standards and regulations.

In addition to NGN, this tutorial also presents the state of the art on Future Networks. Future Networks are being developed in USA, Europe and Asia. ITU-T also started to discuss the standardization issues related to Future Networks, although Future Networks are assumed to be realized in a decade or so.

Biography: Koichi Asatani received his B.E.E.E., M.E.E.E. and Ph. D degrees from Kyoto University in 1969, 1971 and 1974, respectively. From 1974 to 1997, Dr. Asatani was engaged in R&D on optical fiber communication systems, hi-definition video transmission systems, FTTH, ISDN, B-ISDN, ATM networks, IP networks and their strategic planning in NTT. Currently he is Dean, Department of Computer Science and Communications Engineering, Kogakuin University, and a visiting professor, Graduate School of Global Information and Telecommunication, Waseda University, both in Tokyo, Japan. He is a Fellow of IEEE and a Fellow of IEICE. He was appointed as a distinguished lecturer of IEEE Com Soc for 2007-2009.

He is a founder of Communications QoS, Reliability and Performance Modeling series symposium at ICCs and Globecoms. He served as co-chair for this symposium series at ICCs and Globecoms for 2002-2004. He is Ex-Chair and Advisory Board Ex-Chair Emeritus of IEEE Technical Committee on Communication Quality and Reliability (CQR-TC), Feature Editor on Standards (1993-1999), Senior Technical Editor/Technical Editor of IEEE Communications Magazine, and Technical Editor on Broadband Technology of IEEE Communications Survey. From 1988 through 2000, he served as Vice-Chairman of ITU-T SG 13 (formerly CCITT SG XVIII), responsible for digital networks including GII, IP networks and NGN. He is serving as Chair for National Committee on Next Generation Networks in Japan, and also as Chair, R&D and Standardizations Working Group, Next Generation IP Network Promotion Forum.

He has published more than fifty papers, and gave more than seventy talks including keynotes? invited talks and tutorials at international conferences such as ICCs and Globecoms. He is author or co-author of nineteen books including "Quality and Performance Designs of Telecommunication Networks"(IEICE, 1993, in Japanese), "Introductions to ATM Networks and B-ISDN)" (John Wiley and Sons, 1997), "Multimedia Communications Networks - Technologies and Services" (Artech House, 1998), "Multimedia Communications" (Academic Press, 2001), "Information and Communication Technology and Standards" (Denki Tsushin Shinko Kyokai, in Japanese, 2006), "Introduction to Information Networks-Fundamentals of Telecom & Internet Convergence, QoS, VoIP and NGN-" (Corona-sha Publishing Inc., in Japanese, 2007), and Handbook of Enterprise Integration (CRC Press, 2009). His current interests are Information Networks and Network Architectures including Broadband networking, Internetworking, IP telephony, NGN, Future Networks and their QoS aspects.

14:10 - 15:10

D2IT: Invited talk: Prasan de Silva

Multi Connection and Offloading: Trends in standardisation

Biography: Prasan de Silva, has worked for Telecom NZ covering the period 1996 till present in various roles in both fixed and mobile. His mobile experience covers AMPS, D-AMPS, cdma2000 and UMTS networks. His research interests are in IP based mobility management protocols and all-IP wireless architectures. He has a B.E (Hons) and M.E, both from Canterbury University, Christchurch, New Zealand.

15:10 - 15:30

D2AT: Afternoon tea

15:30 - 17:30

D2TU: Tutorial - Introduction to NGN and Future Networks Continued

D2S3T1: Internet 2

Towards Future Internet Applications and Services

Monitoring the User Perceived Quality of SILK-Based Voice Calls
Daniel Schlosser (University of Wuerzburg, Germany); Michael Jarschel (University of Wuerzburg, Germany); Valentin Burger (University of Wuerzburg, Germany); Rastin Pries (University of Wuerzburg, Germany)
pp. 78-83

On User Perception of Web Login - A Study on QoE in the Context of Security
Charlott Lorentzen (Blekinge Institute of Technology, Sweden); Markus Fiedler (Blekinge Institute of Technology, Sweden); Henric Johnson (Blekinge Institute of Technology, Sweden); Junaid Shaikh (Blekinge Institute of Technology, Sweden); Ivar Jørstad (Ubisafe AS, Norway)
pp. 84-89

Hybrid Next Generation Mobile System Analysis Based on Internet Applications
Abu Chowdhury (RMIT University, Australia); Mark A. Gregory (RMIT University, Australia)
pp. 90-95

Intrusion Detection in Honeynets by Compression and Hashing
Fahim Abbasi (Massey University, New Zealand); Richard J Harris (Massey University, New

Zealand)
pp. 96-101

R/Kademlia: Recursive and Topology-Aware Overlay Routing

Bernhard Heep (Karlsruhe Institute of Technology (KIT), Germany)
pp. 102-107

Performance Evaluation of P2P Caches: Flash-Crowd Case

Piotr Cholda (AGH University of Science and Technology, Poland); Jerzy Domzal (AGH University of Science and Technology, Poland); Robert Wójcik (AGH University of Science and Technology, Poland); Rafal Stankiewicz (AGH University of Science and Technology, Poland); Frank Lehrieder (University of Wuerzburg, Germany); Tobias Hoßfeld (University of Wuerzburg, Germany); Simon Oechsner (University of Wuerzburg, Germany); Vlad Singeorzan (University of Würzburg, Germany)
pp. 108-113

19:00 - 22:00

D2CD: Conference dinner

Wednesday, November 3

08:30 - 09:15

D3IT: Invited talk: Prof. Franco Davoli

Energy Efficiency in the Future Internet: Current Status and Trends

Abstract: The concept of energy-efficient networking has begun to spread in the past few years, gaining increasing popularity. Besides the widespread sensitivity to ecological issues, such interest also stems from economic needs, since both energy costs and electrical requirements of telcos and Internet Service Providers infrastructures around the world show a continuously growing trend. The talk explores current perspectives in power consumption for next generation networks, and examines power saving optimization techniques at the levels of the individual networking devices and of the network itself. Approaches to re-engineering, dynamic adaptation, and sleeping/standby methodologies will be briefly surveyed, and the future trends in energy-aware networking will be highlighted.

Biography: Franco Davoli received the "Laurea" degree in Electronic Engineering in 1975 from the University of Genoa, Italy. Since 1990 he has been Full Professor of Telecommunication Networks at the University of Genoa, at the Department of Communications, Computer and Systems Science (DIST). His current research interests are in dynamic resource allocation in multiservice networks, wireless mobile and satellite networks, multimedia communications and services in distributed computing environments, and energy-efficient networking. He has co-authored over 250 scientific publications in international journals, book chapters and conference proceedings. He is a member of the Editorial Board of the International Journal of Communication Systems (Wiley), Studies in Informatics and Control, and Simulation - Transactions of the SCS. In 2004, he was the recipient of an Erskine Fellowship from the University of Canterbury, Christchurch, New Zealand, as Visiting Professor. He has been Principal Investigator in a large number of research projects and has served in several positions in the Italian National Consortium for Telecommunications (CNIT), an independent research organization joining 36 universities all over Italy. He was one of the founders of the CNIT National Laboratory for Multimedia Communications in Naples, Italy, which he led for the term 2003-2004, and Vice-President of the CNIT Management Board for the term 2005-2007. He is a Senior Member of the IEEE.

09:15 - 10:00

D3IT: Invited talk: Prof. Stan Skafidas

Millimeter Wave Wireless Communication Systems: Are we there yet?

Abstract: Millimeter wave wireless systems promise high data rates at low cost and small forms factors. This talk will discuss the latest developments in the field of integrated millimeter wave transceivers and challenges in producing integrated, low cost and robust transceivers.

Biography: Professor Stan Skafidas, from the Department of Electrical and Electronic Engineering and NICTA's Victoria Research Lab, leads our research in nanoelectronics, as well as being the course coordinator for the Master of Nanoelectronic Engineering program. Professor Skafidas received a PhD from the Department of Electrical and Electronic Engineering at the University of Melbourne in 1997. Before joining NICTA in 2004, he was Chief Technology Officer at Bandspeed, a company based in Austin Texas, which designs and manufactures semiconductor products for enterprise class wireless systems. At Bandspeed, Professor Skafidas co-invented Adaptive Frequency Hopping – an important standard component in Bluetooth devices. Arriving at NICTA in July 2004 as Program Leader of Sensor Networks he went on to become Research Group Manager of Embedded Systems. In Feb 2008, Skafidas and his team made an important breakthrough in next-generation wireless technology, being the first to announce the development of an integrated transceiver 60G transceiver delivering 5Gbps using the CMOS process. Professor Skafidas' research interests include: optical communications systems, systems on a chip, high speed mixed signal and radio frequency microelectronics, wireless power transfer and neural interface circuits.

10:00 - 10:30

D3MB: Morning break

10:30 - 11:10

D3IT: Invited talk: Dr. Masud Bakaul

High-Speed Fiber-Wireless Systems Incorporating Wavelength-Interleaved Dense-WDM

Abstract: Broadband wireless access (BWA) operating at millimeter-wave frequencies has been actively investigated for future ultra broadband communications. In these systems remote antenna base stations, suitable for providing untethered connectivity for BWA services, are directly interconnected to a central office via an optical fiber feeder network dedicated for performing all the switching and signal processing functionalities. The higher propagation losses of millimeter-wave frequency signals however shrink the radio coverage of the BSs to microcells and picocells, which increase the number of antenna BSs required to cover a certain geographical area. Therefore, it is imperative that the BS architecture be simplified and be cost-effective to realize, while the fiber feeder network must be capable of supporting the large number of BSs required to service a certain geographical area. By taking advantage of optical networking techniques such as wavelength division multiplexing (WDM), the total capacity of the hybrid fiber-wireless network can be greatly enhanced and efficient optical fiber architectures can be realized. In this talk we'll give an overview of the research that has been carried out in millimeter-wave fiber-wireless networks incorporating WDM, with a particular focus on the subsystem technologies such as OADMs, multiplexers and demultiplexers.

Biography: Masuduzzaman Bakaul is an established researcher and developer in several areas of photonics and microwave communications, such as radio-over-fibre, optical-wireless integration, OFDM-over-fibre towards 100 Gb/s Ethernet and beyond, and optical performance monitoring. Since his inception with the University of Melbourne as a PhD student in 2002, and as a researcher with National ICT Australia (NICTA) in 2006, he has authored 55 refereed publications in these areas, including one book, one book chapter, 15 journals, 9 invited papers, 28 international conference papers and one provisional patent. Most of these papers were published in Tier 1 IEEE, OSA, IEE journals and conferences with the highest impact factors. His paper in IEEE LEOS'2005 conference was awarded the LEOS/Newport/Spectra-Physics Research Excellence Award, which was featured in April 2006 issue of IEEE LEOS monthly newsletter. He has contributed to NICTA's commercialization activities through his research resulting in a start-up company. He has also contributed to organisation of many international conferences. Currently he supervises two PhD students and contributes to teaching of two postgraduate subjects. Prior to joining the University of Melbourne, Dr. Bakaul was an optical engineer with Fiber Optic Network Solutions (FONS) Bangladesh LTD and worked there till 2001. His detail resume, including the list of publications, can be found from http://www.ee.unimelb.edu.au/people/mbakaul/.

11:10 - 12:10

D3S1T1: Optical Communications 2

Optical Communications Session 2

Design of Availability, Reliability, and Restoration for a Telecommunications Access Network Guided by Customer Demand for Quality
    Bob Warfield (University of Melbourne, Australia)
    pp. 114-119

Delay Bound Analysis for Hybrid Network: IEEE 802.11g ERP-OFDM WLAN Over Fiber
    Erna Sugesti (Institut Teknologi Telkom, Indonesia); Purnomo Priambodo (Universitas Indonesia, Indonesia); Kalamullah Ramli (Universitas Indonesia, Indonesia); Bagio Budiardjo (Electrical Engineering Department, University of Indonesia, Indonesia)
    pp. 120-123

12:10 - 13:30

D3LB: Lunch break

13:30 - 15:10

D3TU: Tutorial - WiMAX: Current Standard, Evolution Toward IMT-Advanced and Beyond 802.16m - Dr Hafizal Mohamad

WiMAX has attracted much interest in commercial deployment due to its inherent features delivering a high data-rate with good QoS support. Current WiMAX technology is mainly based on 802.16e-2005 standard, which support mobility to enable connections on the move. It has evolved from fixed (802.16-2004) standard, which was the first wireless metropolitan network (WMAN) standard to be based on OFDM. Initial works for IMT-Advanced started in December 2006 with the formation of 802.16m task group (TGm). The objective of

this tutorial is to highlight current achievement of WiMAX as well as to equip participants with technical details related to current and future 802.16 standards, including system and network beyond 802.16m. This tutorial commences with introductory background on wireless broadband market and overview of future trends. These can be related to current industry effort towards IMT-Advanced. Subsequently an explanation on WiMAX/802.16 standards including commercial deployment, certification, 802.16 standard family and protocol stack overview will be provided. Key enabling techniques (mandatory and optional features) of WiMAX, such as OFDMA, AMC, MIMO, HARQ, STC, QoS and multihop relay, will be discussed in this tutorial. Features of system and network within and beyond 802.16m are also explained.

Tutorial Outline:

1. 1. Introduction
    - Wireless Broadband Market
    - Spectrum and Regulation
    - Future Trends
2. IMT-2000 and IMT-Advanced
    - History of IMT-2000
    - Requirements for IMT-Advanced
3. WiMAX and 802.16 Standards
    - WiMAX Commercial Deployment
    - WiMAX Forum and Certification
    - WiMAX Network Reference Model
    - IEEE 802.16 Standards: Past and Present (1999 – 2010)
    - IEEE 802.16-2004 and 802.16e-2005: Specification and Protocol Stack
    - IEEE 802.16-2009: Revision of IEEE Std 802.16
    - IEEE P802.16m: Performance Requirements, Timeline and Technology Features
    - Beyond 802.16m: Recent Development and Status
4. Key Enabling Technologies
    - Orthogonal Frequency-Division Multiple Access (OFDMA)
    - Adaptive Modulation Coding (AMC)
    - Multiple Input Multiple Output (MIMO) and Smart Antenna
    - Hybrid Automatic Repeat ReQuest (HARQ)
    - Space Time Coding (STC)
    - Quality of Service (QoS)
    - Multihop Relay
5. Competing Technology and Standard
6. Summary

Biography: Hafizal Mohamad received the B.Eng. (First Class Honors) and Ph.D. from University of Southampton, UK in 1998 and 2003, respectively. He has been a faculty member at the Multimedia University, Malaysia from 1998 until 2008. In Feb – Mar 2005, he was a visiting researcher at National Institute of Information and Communications Technology (NICT), Yokosuka, Japan. His current research interests include wireless broadband access (PHY/MAC) and ad-hoc network. In these areas, he has published over 20 journal and conference papers. Since 2007, he has been involved in R&D project related to 802.16/WiMAX as a senior staff researcher in the applied research division of Wireless Communication Cluster at MIMOS Berhad, a Malaysian government funded research institute, where he has 5 patents pending at WIPO and 12 patents pending at MyIPO. He is also an adjunct lecturer at Universiti Putra Malaysia since 2009. He is a member of IEEE and an elected Chair of the IEEE Malaysia Section Communications and Vehicular Technology Society Joint Chapter 2008-2010. He was a Tutorial Chair of the 2005 IEEE International Conf. on Network (ICON) & 2007 IEEE International Conf. on Telecommunications (ICT), and a Technical Program Co-Chair for 2009 IEEE Malaysia International Conf. on Communications (MICC).

D3S2T1: Mobile and Wireless Networks 2

Mobile and Wireless Networks Session 2

Application of Virtual Mobile Networking to Real-Time Patient Monitoring
Devan Bing Rehunathan (University of St Andrews, United Kingdom); Saleem N Bhatti (University of St Andrews, United Kingdom)
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Intelligent Features For IMS-BASED IPTV
Nguyen Tai Hung (Hanoi University of Technology, Vietnam); Nguyen Huu Thanh (Hanoi University of Technology, Vietnam)
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Enabling "Quality of Service" in IEEE802.16 Networks for Distributed Mesh Topologies
Naveen Chilamkurti (LaTrobe University, Australia); Sherali Zeadally (University of the District of Columbia, USA)
pp. 135-140

Remote Stateful Autoconfiguration for Mobile IPv6 Nodes with Server Side Duplicate Address Detection
Tomasz Mrugalski (Gdansk University of Technology, Poland); Jozef Wozniak (Gdansk University of Technology, Poland); Krzysztof Nowicki (Gdansk University of Technology, Poland)
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D3AT: Afternoon tea

15:30 - 17:30

D3TU: Tutorial - WiMAX Continued

15:30 - 16:50

D3S3T1: Wireless Sensor Networks 2

Routing

An Adaptive Coordination Scheme for Opportunistic Routing Protocol in Wireless Sensor Networks
Mohd Rusli (Massey University, New Zealand); Richard J Harris (Massey University, New Zealand)
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Comparative Study of AODV Route Repair Mechanism with Impact on Node Mobility and Traffic Load in Wireless Mesh Networks
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An Experimental Comparison of Routing Protocols in Multi Hop Ad Hoc Networks
David E Murray (Murdoch University, Australia); Michael Dixon (Murdoch University, Australia); Terry Koziniec (Murdoch University, Australia)
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