

# ACCESSNETS 2007

August 21-23, 2007, Ottawa, Ontario, Canada



## CONFERENCE PROGRAM

### Second International Conference on Access Networks

August 21-23, 2007, Ottawa, Ontario, Canada

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## MESSAGE FROM THE GENERAL CHAIR



On behalf of the organizing committee, it is my great pleasure to welcome you all to the 2007 Second International Conference on Access Networks to be held in Ottawa, Canada, on August 21-23, 2007.

The annual International Conference on Access Networks (AccessNets) aims at providing a forum that brings together scientists and researchers from academia as well as managers and engineers from the industry and government organizations to meet and exchange ideas and recent work on all aspects of access networks. As the second edition of this exciting event, AccessNets'07 will present you an exciting technical program consisting of keynote speeches, invited talks, technical sessions, panels, and workshops. The keynote speeches will be delivered by Dr. Hussein T. Mouftah and Dr. Raj Jain, world-wide renowned research leaders in the area of access networks, and the invited talks will be given by leading experts with different research backgrounds in the area. The technical sessions will present original research results while the workshops and panels will focus on development, application, and related business issues in this exciting area.

I would like to take this opportunity to thank all the organizing committee members for their enthusiastic and excellent job during the entire process of organizing this event. I am so grateful to all the TPC members and reviewers for their time and inputs in carefully reviewing all the papers and providing valuable review comments. Many thanks go to the steering committee, chaired by Dr. Imrich Chlamtac, for giving helpful advices in organizing the conference. I am also thankful to all the ICST staff, in particular, our conference coordinator, Zita Rozsa, for their active support and assistance during the entire process of organizing the event. In addition, I would like to acknowledge Create-Net, ICST, IEEE Communications Society, and IEEE Ottawa Section for their invaluable co-sponsorship for this event.

Nestled on the banks of the majestic Ottawa, Rideau and Gatineau Rivers, Ottawa is one of the most beautiful capitals in the world. The city is not only a thriving international technology and business centre, but also rich in culture and heritage with its many national institutions, parklands, waterways and historic architecture. With a wide range of cultural and historical sites, Ottawa offers visitors a lot of attractions and sighting opportunities.

I hope that you will enjoy our technical program and your time at the conference. I also hope that you will take the advantage to visit the city of Ottawa and have a pleasant and memorable stay.

I am looking forward to welcoming you in Ottawa.

General Chair, AccessNets 2007

Jun Zheng, University of Ottawa

## KEYNOTE ADDRESS I



**Hussein T. Mouftah**  
**Professor and Canada Research Chair in Optical Networks**  
**School of Information Technology and Engineering**  
**University of Ottawa, Canada**

**Date and Time: Wednesday August 22 2007 09:00am – 10:00am**

### **Advances in Optical Access Networks**

#### **Abstract**

Explosion of data and mass availability of Internet connections around the globe had created huge bandwidth requirements for bandwidth hungry applications. Despite the technological advances in the core and their ability to transport, still much work has to be done in the access networks in order to be able to let the broadband traffic be transmitted transparently. Current solutions for access networks do not provide a concrete solution for the famous last mile problem. In this talk we will present optical access networks as viable solutions to the ongoing problems in the access networks. Further we will cover physical and technological limitations with the current state-of-the-art optical technology. We will address the optical access networks promises in responding to these shortcomings. We will focus on passive optical networks (PONs), reviewing different type of PONs considering their benefits and limitations.

Ethernet passive optical network (EPON) has been considered as an attractive solution to next-generation broadband access networks due to its low cost and high throughput. However, designing efficient bandwidth allocation algorithms (DBAs) is a critical issue in EPON. In this talk, we will also cover dynamic bandwidth allocation algorithms along with the role which the multipoint control protocol (MPCP) plays in their design.

#### **Biography**

Hussein T. Mouftah joined the School of Information Technology and Engineering (SITE) of the University of Ottawa in September 2002 as a Tier 1 Canada Research Chair in Optical Networks, where he became a Distinguished University Professor in 2006. He has been with the Department of Electrical and Computer Engineering at Queen's University (1979-2002), where he was prior to his departure a Full Professor and the Department Associate Head. He has three years of industrial experience mainly at Bell Northern Research of Ottawa, now Nortel Networks (1977-79).

He has spent three sabbatical years also at Nortel Networks (1986-87, 1993-94, and 2000-01), always conducting research in the area of broadband packet switching networks, quality of service over the Internet, mobile wireless ad hoc and sensor networks and optical networks. He served as Editor-in-Chief of the IEEE Communications Magazine (1995-97) and IEEE Communications

Society Director of Magazines (1998-99), Chair of the Awards Committee (2002-2003), Member of the Board of Governors (1997-2000 and 2006-), Director of Education (2006-). He is a Distinguished Speaker of the IEEE Communications Society since 2000.

Dr. Mouftah is the author or coauthor of 5 books, 24 book chapters, more than 800 technical papers and 9 patents in this area. He is the joint holder of the Best Paper Award for a paper presented at SPECTS'2002 and the IEEE ICC2005 Optical Networking Symposium, and the Outstanding Paper Award for papers presented at the IEEE HPSR'2002 and the IEEE ISMVL'1985. Also he is the joint holder of a Honorable Mention for the Frederick W. Ellersick Price Paper Award for Best Paper in the IEEE Communications Magazine in 1993. He has received numerous prestigious awards, such as the 2007 Thomas W. Eadie Medal of the Royal Society of Canada, the 2006 IEEE Canada McNaughton Medal, the 2006 EIC Julian Smith Medal, the 2004 IEEE ComSoc Edwin Howard Armstrong Achievement Award, the 2004 George S. Glinski Award for Excellence in Research of the U of O Faculty of Engineering, the 1989 Engineering Medal for Research and Development of the Association of Professional Engineers of Ontario (PEO), and the Ontario Distinguished Researcher Award of the Ontario Innovation Trust (2002). Also, he is the recipient of the IEEE ComSoc 2006 CSIM Distinguished Service Award, and IEEE Canada (Region 7) Outstanding Service Award (1995). Dr. Mouftah is a Fellow of the IEEE (1990), the Canadian Academy of Engineering (2003) and the Engineering Institute of Canada (2005).

## KEYNOTE ADDRESS II



**Raj Jain**  
**Professor of Computer Science and Engineering**  
**Department of Electrical and Computer Engineering**  
**Washington University in St. Louis, USA**

**Date and Time: Thursday August 23 2007 09:00am – 10:00am**

### **Wireless Access Networks: Recent Developments, Issues and Trends**

#### **Abstract**

Broadband access is quickly becoming ubiquitous. Among the technologies for access, wireless is becoming the preferred technology for reasons of mobility, cost, and convenience. In this talk we begin with the recent trends in the wireless access market, summarize the key technical developments that are leading to increasing reach and speeds. WiMAX is almost here but the competing technologies, such as HSPA, EV-DO, LTE, IEEE 802.20, IEEE 802.22 are also trying to catch up fast and the next generation WiMAX is already being designed. These and other developments will be presented.

#### **Biography**

Raj Jain is a Professor of Computer Science and Engineering at Washington University, St. Louis, MO. He was Co-founder and Chief Technology Officer of Nayna Networks, Inc. - a next generation broadband access equipment company in San Jose, CA and co-chair of the SPIE 2007 conference on Broadband Access Communication Technologies. Dr. Jain is a Fellow of IEEE, a Fellow of ACM. He has served on the Board of Technical Advisors to several companies including Nexabit Networks, Westborough, MA acquired by Lucent Corporation. (March 1997-1999), Amber Networks, Fremont, CA acquired by Nokia (1999-2001).

He is the author of "Art of Computer Systems Performance Analysis," which won the 1991 "Best-Advanced How-to Book, Systems" award from Computer Press Association. His fourth book entitled " High-Performance TCP/IP: Concepts, Issues, and Solutions," was published by Prentice Hall in November 2003.

Based on his active participation in the computer industry, Dr. Jain was awarded 1999 siliconindia Leadership Awards for Excellence and Promise in Business and Technology. He is also a winner of ACM SIGCOMM Test of Time award.

## TECHNICAL PROGRAM AT A GLANCE

Tuesday, August 21 2007

09:00am – 12:00pm	Workshop I
12:00pm – 01:30pm	Lunch Break
01:30pm – 04:50pm	Workshop II
06:30pm – 08:30pm	Welcome Reception

Wednesday, August 22 2007

08:45am – 09:00am	Welcome
09:00am – 10:00am	Keynote Talk I
10:00am – 10:30am	Coffee Break
10:30am – 12:15pm	Session 1: Passive Optical Networks
12:15pm – 01:30pm	Lunch Break
01:30pm – 03:15pm	Session 2: DSL, PLC, and Home Networks
03:15pm – 03:30pm	Coffee Break
03:30pm – 04:30pm	Panel I
04:30pm – 04:45pm	Break
04:45pm – 06:00pm	Session 3: EPON and Ethernet Networks

Thursday, August 23 2007

09:00am – 10:00am	Keynote Talk II
10:00am – 10:30am	Coffee Break
10:30am – 12:15pm	Session 4: Wireless Access Networks I
12:15pm – 01:30pm	Lunch Break
01:30pm – 03:15pm	Session 5: Access Networks
03:15pm – 03:30pm	Coffee Break
03:30pm – 04:30pm	Panel II
04:30pm – 04:45pm	Break
04:45pm – 06:15pm	Session 6: Wireless Access Networks II
06:15pm – 07:00pm	Break
07:00pm – 09:00pm	Banquet Dinner

# TECHNICAL PROGRAM

## Tuesday, August 21 2007

Tuesday, August 21 2007 09:30am – 12:00pm

Room: O'Connor Salon (2nd floor)

**Workshop 1: Broadband Wireless Internet (BWIA'07)**

12:00pm – 01:30pm

**Lunch Break: Cafe Toulouse**

Tuesday, August 21 2007 01:30pm – 04:50pm

Room: O'Connor Salon (2nd floor)

**Workshop 2: Microwaves and Photonics in Access Networks (MICPAN'07)**

06:30pm – 08:30pm

**Welcome Reception: Sussex Salon (27th Floor)**

## Wednesday, August 22 2007

Wednesday, August 22 2007 08:45am – 09:00am

Room: Laurier Salon (Lower Level)

**Welcome Addresses**

Wednesday, August 22 2007 09:00am – 10:00am

Room: Laurier Salon (Lower Level)

**Keynote Talk I: Advances in Optical Access Networks**

Dr. Hussein T. Mouftah, University of Ottawa, Canada

Coffee Break

Wednesday, August 22 2007 10:30am – 12:15pm

Room: Laurier Salon (Lower Level)

**Session 1: Passive Optical Networks**

Chair: John Mitchell, University College London, UK

**1. Invited Talk: WDM EPON: Future Applications and Services**

Martin Maier, INRS, University of Quebec, Canada

**2. A new Control Plane for Next-Generation WDM-PON Access Systems**

Maurice Gagnaire, Ecole Nationale Supérieure des Télécommunications (ENST), France;

Mohamed Koubaa, Ecole Nationale d'Ingénieurs de Tunis (ENIT), Tunisie

**3. A Delay-Based Provisioning for Ethernet Passive Optical Networks**

Ali Nouroozifar, University of Ottawa, Canada; Hassan Nasar, Lakehead University, Canada;

Hussein T. Mouftah, University of Ottawa, Canada

**4. Design and Cost Performance of the WDM PON for Multi-Wavelength Users**

Jürgen Schussmann and Thomas Schirl, Carinthian University of Applied Sciences, Austria

**5. Enforcing Bandwidth Allocation and traffic conformance in Passive Optical Networks**

M.Thanh Ngo and Annie Gravey, ENST Bretagne, France

12:15pm – 01:30pm

Lunch Break: Sussex Salon (27th Floor)

Wednesday, August 22 2007 01:30pm – 03:15pm

Room: Laurier Salon (Lower Level)

**Session 2: DSL, PLC, and Home Networks**

Chair: Stefano Galli, Panasonic, USA

- 1. Invited Talk: DSL – From A to V and Back Again**  
Scott Valcourt, University of New Hampshire, USA
- 2. Spectrum Balancing for DSL with Restrictions on Maximum Transmit PSD**  
Driton Statovci, Tomas Nordstrom, and Rickard Nilsson, Telecommunications Research Center  
Vienna, Austria
- 3. A Simple Packet-Classifer Algorithm for QoS Control in Home Networks**  
Toshinori Takabatake, Shonan Institute of Technology, Japan
- 4. On Dynamic Packet Fragmentation for Traffic Integration over Bandwidth-Limited Links**  
Guo Liang and Whay Chiou Lee, Broadband Networks Research Lab, Motorola; Ying-Ieh Lin,  
Airvana, USA

Coffee Break

Wednesday, August 22 2007 03:30pm – 04:30pm

Room: Laurier Salon (Lower Level)

**Panel 1: Customer Driven Broadband Access Delivery**

Panelists:

Francois Blouin, Manager, High Performance Multimedia, Office of the CTO, Nortel Networks,  
Canada

Bill St-Arnault, Chief Research Officer, CANARIE, Canada

Christine Tremblay, Professor, École de Technologie Supérieure (ÉTS), Canada

Nicholas Gagnon, Business Development Manager, Access Networks, EXFO, Canada

Break

Wednesday, August 22 2007 04:45pm – 06:00m

Room: Laurier Salon (Lower Level)

**Session 3: EPON and Ethernet Networks**

Chair: Maurice Gagnaire, Ecole Nationale Supérieure des Télécommunications (ENST), France

- 1. Delay Analysis of Ethernet Passive Optical Networks with Quasi-Leaved Polling and Gated Service Scheme**  
Xiaofeng Bai and Abdallah Shami, University of Western Ontario, Canada
- 2. On triplexer design for next generation Ethernet Passive Optical Network (EPON) systems**  
João Miguel Santos and Marek Hajduczenia, Siemens Networks S.A., Portugal
- 3. Performance of Rapid Spanning Tree Protocol in Access and Metro Networks**

Richárd Pallos and János Farkas, Ericsson Research, Hungary; István Moldován and Csaba Lukovszki, Budapest University of Technology and Economics, Hungary

**4. Bandwidth Guarantees for Resilient Ethernet Network through RSTP Port Cost Optimization**

András Kern, István Moldován and Tibor Cinkler, Budapest University of Technology and Economics, Hungary

**Thursday, August 23 2007**

Thursday, August 23 2007 09:00am – 10:00am

Room: Laurier Salon (Lower Level)

**Keynote Talk II: Wireless Access Networks: Recent Developments, Issues, and Trends**

Dr. Raj Jain, Washington University in St. Louis, USA

Coffee Break

Thursday, August 23 2007 10:30am – 12:15pm

Room: Laurier Salon (Lower Level)

**Session 4: Wireless Access Networks I**

Chair: Alessandro Bogliolo, University of Urbino, Italy

**1. Invited Talk: Dynamic Spectrum Access in the IEEE 802.22 Wireless Regional Area Network**

David Wright, University of Ottawa, Canada

**2. Capacity Analysis and Resource Management of an Integrated WiMAX & Wi-Fi Access System for VoIP**

Huanxu Pan, Satoru Yamano, Daisuke Kawasaki and Hideaki Tani, System Platforms Research Laboratories, NEC Corporation, Japan

**3. A Cost Model for Broadband Access Networks: FTTx versus WiMAX**

João Paulo Pereira, ESTiG – IPBragança

**4. Throughput Analysis Considering Capture Effect in 802.11 Networks**

Xiaohu Ge, Dong Yan, Yaoting Zhu, Huazhong University of Science & Technology, China

**5. A Rate-Adaptive Cooperative MAC Protocol Based on RTS/CTS Scheme for MANETS**

Haitao Zhao, Jibo Wei, and Yong Xi, NUDT, China

12:15pm – 01:30pm

**Lunch Break: Sussex Salon (27th Floor)**

Thursday, August 23 2007 01:30pm – 03:15pm

Room: Laurier Salon (Lower Level)

**Session 5: Access Networks**

Chair: Francois D. Ménard, Xit Telecommunications Inc., Canada

**1. Invited Talk: Radio over Fiber Networks**

John Mitchell, University College London, UK

2. **Radio-Over-Fiber to Increase Effective Coverage of Motorway Access Networks**  
Weixi Xing, Yue Li, and Jinho Choi, IAT, University of Wales, UK
3. **Design of a Survivable Multi-Wavelength Access Network**  
Rajeev Roy and Wim van Etten, University of Twente, Netherlands
4. **On optimized Passive Optical Network (PON) Deployment**  
Branka Lakic and Marek Hajduczenia, Siemens Networks S.A., Portugal
5. **Overcoming the Digital Divide in Rural Areas**  
Francois D. Ménard and Robert Proulx, Xit Telecommunications Inc., Canada

Coffee Break

Thursday, August 23 2007 03:30pm – 04:30pm

Room: Laurier Salon (Lower Level)

**Panel II: Achieving Rural Broadband Ubiquitous Availability**

Panelists:

- François D. Ménard, Project Manager, Xit Télécom Inc., Canada
- Robert Proulx, President, Kittel Telecommunications Inc., Canada
- Gérald Chouinard, Program Manager, Rural and Remote Broadband Access, CRC, Canada
- Robert Forget, Director, Wireless Sales at Vecima Networks Inc., Canada

Break

Thursday, August 23 2007 04:45pm – 06:00pm

Room: Laurier Salon (Lower Level)

**Session 6: Wireless Access Networks II**

Chair: David Wright, University of Ottawa, Canada

1. **Urbino Wireless Campus: A Wide-Area University Wireless Network to Bridge Digital Divide**  
Alessandro Bogliolo, University of Urbino, Italy
2. **Routing for Multi-Antenna Wireless Mesh Network Backhaul**  
Enzo Baccarelli, Mauro Biagi, Cristian Pelizzoni, and Nicola Cordeschi, University of Rome, Italy
3. **Space Division Competitive Access for Infrastructured Wireless Mesh Networks**  
Enzo Baccarelli, Mauro Biagi, Cristian Pelizzoni, and Nicola Cordeschi, University of Rome, Italy
4. **Performance Analysis of CDMA2000 Reverse Packet Data Channel**  
Ayda Basyouni, Ahmed Elhakeem, and Anjali Agarwal, Concordia University, Canada

Break

07:00pm – 09:00pm

**Banquet Dinner: Sussex Salon (27th Floor)**