



# IEEE HPSR 2011

July 3-6, 2011  
Cartagena, Spain



## 12<sup>th</sup> International Conference on High Performance Switching and Routing

Dedicated to Prof. Fabio Neri, in memoriam

| Time          | Sun 3                     | Mon 4           | Tue 5  | Wed 6                      |
|---------------|---------------------------|-----------------|--|----------------------------|
| 9:00 – 9:15   |                           | Registration    |  |                            |
| 9:15 – 9:45   | First tutorial – part I   | Opening         | Session 4                                      | Session 8                  |
| 9:45 – 10:30  |                           | Keynote speaker |  |                            |
| 10:30 – 10:45 | Coffee break              | Coffee break    | Coffee break                                   | Coffee break               |
| 10:45 – 11:00 |                           |                 |  |                            |
| 11:00 – 11:15 | First tutorial – part II  | Session 1       | Session 5                                      | Session 9                  |
| 11:15 – 11:45 |                           |                 |  |                            |
| 11:45 – 12:30 | Lunch                     | Lunch           | Lunch  | Lunch                      |
| 12:30 – 14:00 | Second tutorial – part I  | Session 2       | Session 6                                      | Session 10                 |
| 14:00 – 15:00 |                           |                 |  |                            |
| 15:00 – 15:30 | Coffee break              | Coffee break    | Coffee break                                   | Coffee break               |
| 15:30 – 15:45 |                           |                 |  |                            |
| 15:45 – 16:00 | Second tutorial – part II | Session 3       | Session 7                                      | Session 11                 |
| 16:00 – 16:15 |                           |                 |  |                            |
| 16:15 – 17:30 |                           |                 |  | Closing. Best paper awards |
| 17:30 – 17:45 |                           |                 | Coffee break                                   |                            |
| 17:45 – 18:00 |                           |                 |  |                            |
| 18:00 – 18:15 |                           |                 | HPSR committee meeting (open to all attendees) |                            |
| 18:15 – 18:30 |                           |                 |  |                            |
| 18:30 – 19:00 |                           | Social event    |  |                            |
| 19:00 – 19:15 |                           |                 |  |                            |
| 19:15 – 19:30 | Welcome reception         |                 |  |                            |
| 19:30 – 20:00 |                           |                 |  |                            |
| 20:00 – 21:00 |                           |                 | Gala dinner                                    |                            |
| 21:00 – 21:30 |                           |                 |  |                            |

### Tutorials

**Location:** “Salón de Grados” (Conference Main Room)

- 100 Gigabit Ethernet and Beyond**
  - Sarah Ruepp (DTU Fotonik, Technical University of Denmark, Denmark);
  - Henrik Wessing (DTU Fotonik, Technical University of Denmark, Denmark);
  - Michael Berger (DTU Fotonik, Technical University of Denmark, Denmark)
- Green Technologies for Smarter Next-Generation Wire-line Networks**

- Raffaele Bolla (University of Genoa, Italy);
- Roberto Bruschi (Consorzio Nazionale Interuniversitario per le Telecomunicazioni (CNIT), Italy)

## Session 1: Packet Processing and Scheduling

**Chair:** Roberto Rojas-Cessa

**Location:** “Salón de Grados” (Conference Main Room)

1. ***Space-time tradeoffs in Software-based Deep Packet Inspection***
  - Anat Bremler-Barr (Interdisciplinary Center Herzliya, Israel);
  - Yotam Harchol (Hebrew University of Jerusalem, Israel);
  - David Hay (The Hebrew University of Jerusalem, Israel)
2. ***High-Performance Implementation of In-Network Traffic Pacing***
  - Y. Sinan Hanay (University of Massachusetts, USA);
  - Abhishek Dwaraki (University of Massachusetts, USA);
  - Tilman Wolf (University of Massachusetts, USA)
3. ***StablePlus: A Practical 100% Throughput Scheduling for Input-Queued Switches***
  - Yu Xia (Southwest Jiaotong University, P.R. China)
  - H. Jonathan Chao (Polytechnic Institute of New York University, USA)
4. ***NAF Conversion: An Efficient Solution for the Range Matching Problem in Packet Filters***
  - Nizar Ben Neji (Higher School of Communication of Tunis, Tunisia)
  - Adel Bouhoula (Hight School of Communications of Tunisia, Tunisia)

## Session 2: Router and Switch Architecture

**Chair:** Achille Pattavina

**Location:** “Salón de Grados” (Conference Main Room)

1. ***Implementation of ARP-Path Low Latency Bridges in Linux and OpenFlow/NetFPGA***
  - Guillermo Ibáñez (Universidad de Alcalá, Spain);
  - Bart De Schuymer (Art in Algorithms, Belgium);
  - Jad Naous (Stanford University, USA);
  - Diego Rivera (Universidad de Alcalá, Spain);
  - Elisa Rojas (Universidad de Alcalá, Spain);
  - Juan A. Carral (Universidad de Alcalá, Spain)
2. ***Evaluating the Energy-Awareness of Future Internet Devices***
  - Raffaele Bolla (University of Genoa, Italy);
  - Chiara Lombardo (University of Genoa, Italy);
  - Roberto Bruschi (CNIT, Italy);
  - Diego Suino (Telecom Italia, Italy)
3. ***Partial Directional Gossip Failure Detector for Scalable Switch Network***
  - Guanghui Yang (Tsinghua University, P.R. China);
  - Jianping Wu (Tsinghua University, P.R. China);
  - Youjian Zhao (Tsinghua University, P.R. China)
4. ***On the optimum switch radix in fat tree networks***
  - Cyriel Minkenbergh (IBM Zurich Research Laboratory, Switzerland);
  - Ronald P. Luijten (IBM Zurich research Laboratory, Switzerland);

- German Rodriguez (Barcelona Supercomputing Center, Spain)
- 5. ***FPGA Controller for Rearrangeable  $\text{Log}_2(N,0,p)$  Fabrics with an Even Number of Stages***
  - Marek Michalski (Poznan University of Technology, Poland);
  - Wojciech Kabacinski (Poznan University of Technology, Poland)

### Session 3: Network Planning, Management and Architecture

**Chair:** Arunabha Sen

**Location:** “Salón de Grados” (Conference Main Room)

1. ***High-Performance Routing for Hose-Based VPNs in Multi-Domain Backbone Networks***
  - Xiuzhong Chen (University of California, USA);
  - Marc De Leenheer (Ghent University, Belgium);
  - Chaitanya S. K. Vadrevu (University of California, USA);
  - Lei Shi (University of California, USA);
  - Jie Zhang (Beijing University of Posts and Telecommunications, P.R. China);
  - Biswanath Mukherjee (University of California, USA)
2. ***A GMPLS/OBS Network Architecture Enabling QoS-aware End-to-End Burst Transport***
  - Pedro Pedroso (Universitat Politècnica de Catalunya, Spain);
  - Jordi Perelló (Universitat Politècnica de Catalunya, Spain);
  - Mirosław Klinkowski (National Institute of Telecommunications, Poland);
  - Davide Careglio (Universitat Politècnica de Catalunya, Spain);
  - Salvatore Spadaro (Universitat Politècnica de Catalunya, Spain);
  - Josep Solé-Pareta (Universitat Politècnica de Catalunya, Spain)
3. ***To Switch On or Off: A Simple Case Study on Energy Efficiency in IP-over-WDM Networks***
  - Marcel Caria (Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany);
  - Mohit Chamania (Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany);
  - Admela Jukan (Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany)
4. ***Dynamic Anycasting over Wavelength Routed Networks with Lightpath Switching***
  - Bharath H. Ramaprasad (University of Massachusetts, USA);
  - Arush G Gadkar (University of Massachusetts, USA);
  - Vinod M. Vokkarane (University of Massachusetts, USA)

### Session 4: Network Planning, Management and Architecture

**Chair:** Nina Skorin-Kapov

**Location:** “Salón de Grados” (Conference Main Room)

1. ***Study of a Hybrid OCDMA-WDM Segmented Ring for Metropolitan Area Networks***
  - Gerson Rodríguez de los Santos (Universidad Carlos III de Madrid, Spain);
  - José Alberto Hernández (Universidad Carlos III de Madrid, Spain);
  - Manuel Urueña (Universidad Carlos III de Madrid, Spain);

- Isaac Seoane (Universidad Carlos III de Madrid, Spain);
- D. Larrabeiti (Universidad Carlos III de Madrid, Spain)
- 2. **RRPD strategies for a T-OBS network architecture**
  - Oscar Pedrola (Universitat Politècnica de Catalunya, Spain);
  - Davide Careglio (Universitat Politècnica de Catalunya, Spain);
  - Miroslaw Klinkowski (National Institute of Telecommunications, Poland);
  - Josep Solé-Pareta (Universitat Politècnica de Catalunya, Spain)
- 3. **Multicast Tree Computation in Networks with Multicast Incapable Nodes**
  - Limin Tang (University of Texas at Dallas, USA);
  - Wanjun Huang (University of Texas at Dallas, USA);
  - Miguel Razo (University of Texas at Dallas, USA);
  - Arularasi Sivasankaran (University of Texas at Dallas, USA);
  - Marco Tacca (University of Texas at Dallas, USA);
  - Andrea Fumagalli (University of Texas at Dallas, USA)
- 4. **Online Lightpath Provisioning and Critical Services: New IA-RWA Algorithms to Assure QoT and Survivability**
  - Davide Adami (CNIT, University of Pisa, Italy);
  - Stefano Giordano (University of Pisa, Italy);
  - Michele Pagano (University of Pisa, Italy);
  - Luiz Gustavo Zuliani (University of Pisa, Italy)

## Session 5: Router and Switch Architecture

**Chair:** Moshe Zukerman

**Location:** “Salón de Grados” (Conference Main Room)

1. **OOK Q-factor Degradation in Scalable Optical Switches**
  - Qing Xu (Université Laval, Canada);
  - Houman Rastegarfar (University of Toronto, Canada);
  - Yousra Ben M'Sallem (Université Laval, Canada);
  - Sophie LaRoche (Université Laval, Canada);
  - Alberto Leon-Garcia (University of Toronto, Canada);
  - Leslie Rusch (Université Laval, Canada)
2. **Design and Control of Next Generation Distribution Frames**
  - Davide Cuda (Politecnico di Torino, Italy);
  - Paolo Giaccone (Politecnico di Torino, Italy);
  - Massimo Montalto (Politecnico di Torino, Italy)
3. **Memory-Memory-Memory Clos-Network Packet Switches with In-Sequence Service**
  - Ziqian Dong (New York Institute of Technology, USA);
  - Roberto Rojas-Cessa (New Jersey Institute of Technology, USA);
  - Eiji Oki (The University of Electro-Communications, Japan)
4. **An Improved Design of Optical LIFO Buffer with Switched Delay Lines**
  - Xiaoliang Wang (Nanjing University, P.R. China);
  - Xiaohong Jiang (Future University-Hakodate, Japan);
  - Achille Pattavina (Politecnico di Milano, Italy)

## Session 6: Traffic Engineering

**Chair:** David Larrabeiti

**Location:** “Salón de Grados” (Conference Main Room)

1. ***Beyond RED: Periodic Early Detection for On-Chip Buffer Memories in Network Elements***
  - Andrea Francini (Bell Labs, Alcatel-Lucent, USA)
2. ***VAIPA: A Video-Aware Internet Protocol Architecture***
  - Victor Murcia (Universidad Politécnica de Valencia, Spain);
  - Amelia Delgado (Universidad Politécnica de Valencia, Spain);
  - Tito R. Vargas H. (Universidad Politécnica de Valencia, Spain);
  - Juan C. Guerri (Universidad Politécnica Valencia, Spain);
  - Javier Antich (Juniper Networks, USA)
3. ***Fuzzy-CAC Driven MPLS-TE Realization***
  - Jans Jelinskis (Riga Technical University, Latvia);
  - Andris Skrastiņš (Riga Technical University, Latvia);
  - Gunārs Lauks (Riga Technical University, Latvia)
4. ***Link Dimensioning for Fractional Brownian Input***
  - Jiongze Chen (The University of Hong Kong, Hong Kong);
  - Ronald G. Addie (University of Southern Queensland, Australia);
  - Moshe Zukerman (City University of Hong Kong, Hong Kong)
5. ***Improvement of Maximum Admissible QoS Traffic by Traffic Observations***
  - Taiju Mikoshi (Nihon University, Japan);
  - Toyofumi Takenaka (Nihon University, Japan);
  - Takayuki Fujiwara (NTT, Japan);
  - Akeo Masuda (NTT, Japan);
  - Kohei Shiimoto (NTT, Japan)

## Session 7: Survivability

**Chair:** Hussein Mouftah

**Location:** “Salón de Grados” (Conference Main Room)

1. ***Assessing Network Vulnerability Under Probabilistic Region Failure Model***
  - Xiaoliang Wang (Nanjing University, P.R. China);
  - Xiaohong Jiang (Future University-Hakodate, Japan);
  - Achille Pattavina (Politecnico di Milano, Italy)
2. ***Beyond Connectivity - New Metrics to Evaluate Robustness of Networks***
  - Sujogya Banerjee (Arizona State University, USA);
  - Shahrzad Shirazipourazad (Arizona State University, USA);
  - Pavel Ghosh (Arizona State University, USA);
  - Arunabha Sen (Arizona State University, USA)
3. ***Two-Step Routing for Dynamic Traffic Protection in WDM Networks with Wavelength Continuity Constraint***
  - Minjing Mao (The University of Hong Kong, Hong Kong);
  - Kwan Yeung (The University of Hong Kong, Hong Kong)
4. ***A Problem Reduction Approach for the Design of Fault-Tolerant Wireless-Optical Access Networks***
  - Noelia Correia (University of Algarve, Portugal);
  - Gabriela Schütz (University of Algarve, Portugal)

## Session 8: Routing

**Chair:** Ramon Aparicio-Pardo

**Location:** “Salón de Grados” (Conference Main Room)

1. ***SDBGP: A Scalable, Distributed BGP Routing Protocol Implementation***
  - Xiaozhe Zhang (National university of defense Technology, P.R. China)
2. ***Group-based Two-hop Relay with Redundancy in MANETs***
  - Jiajia Liu (Tohoku University, Japan);
  - Xiaohong Jiang (Future University-Hakodate, Japan);
  - Hiroki Nishiyama (Tohoku University, Japan);
  - Nei Kato (Tohoku University, Japan)
3. ***Hierarchical Cluster-Based Link State Routing Protocol for Large Self-Organizing Networks***
  - Guizani Badreddine (Ecole National des Sciences D'Informatique, Tunisia);
  - Béchir Ayeb (Faculté des Sciences de Monastir, Tunisia);
  - Abder Koukam (SeT. Lab., UTBM Belfort France, France)
4. ***A dynamic on-line path computation algorithm for VNT configuration in GMPLS controlled multi-layer (Ethernet/WSON) network***
  - Anica Bukva (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain);
  - Ramon Casellas (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain);
  - Raul Muñoz (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain);
  - Ricardo Martinez (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain)

## Session 9: Packet Processing and Scheduling

**Chair:** Aleksandra Smiljanic

**Location:** “Salón de Grados” (Conference Main Room)

1. ***Using Hardware Classification to Improve PC-Based OpenFlow Switching***
  - Voravit Tanyinyong (KTH Royal Institute of Technology, Sweden);
  - Markus Hidell (KTH Royal Institute of Technology, Sweden);
  - Peter Sjödin (KTH Royal Institute of Technology, Sweden)
2. ***Shift-Based Pattern Matching for Compressed Web Traffic***
  - Anat Bremler-Barr (Interdisciplinary Center Herzliya, Israel);
  - Yaron Koral (Tel Aviv University, Israel);
  - Victor Zigdon (IDC, Israel)
3. ***Out-of-Sequence Preventative Cell Dispatching for Multicast Input-Queued Space-Memory-Memory Clos-Network***
  - Hao Yu (Technical University of Denmark, Denmark);
  - Sarah Ruepp (Technical University of Denmark, Denmark);
  - Michael S. Berger (Technical University of Denmark, Denmark)
4. ***Simple Low-Jitter Scheduler***
  - Wladek Olesinski (Oracle, USA);
  - Hans Eberle (Oracle, USA)

## Session 10: Router and Switch Architecture

**Chair:** Paolo Giaccone

**Location:** “Salón de Grados” (Conference Main Room)

1. ***Design and performance evaluation of a GMPLS-enabled MPLS-TP/PWE3 node with integrated 10Gbps tunable DWDM transponders***
  - Ricard Vilalta (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain);
  - Raul Muñoz (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain);
  - Ramon Casellas (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain);
  - Ricardo Martinez (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain)
2. ***Characterization of A Shared Buffer Optoelectronic Packet Router***
  - Shunyuan Ye (Polytechnic Institute of New York University, USA);
  - Marina Thottan (Bell Labs, USA);
  - Jesse Edward Simsarian (Bell Labs, Alcatel-Lucent, USA);
  - Shivendra Panwar (Polytechnic Institute of New York University, USA)
3. ***AWG-based architecture for optical interconnection in asynchronous systems***
  - Diego Lucerna (Politecnico di Milano, Italy);
  - Guido Maier (Politecnico di Milano, Italy);
  - Achille Pattavina (Politecnico di Milano, Italy)
4. ***Performance of a Software Switch***
  - Nuutti Varis (Aalto University, Finland);
  - Jukka M J Manner (Aalto University, Finland)
5. ***Analytical Model of Asynchronous Shared-per-Wavelength Multi-fiber Optical Switch***
  - Nail Akar (Bilkent University, Turkey);
  - Carla Raffaelli (University of Bologna, Italy);
  - Michele Savi (Norwegian University of Science and Technology, Norway)

## Session 11: Packet Processing and Scheduling

**Chair:** Andrea Francini

**Location:** “Salón de Grados” (Conference Main Room)

1. ***FPGA Implementation of Lookup Algorithms***
  - Zoran Chicha (Belgrade University, Serbia);
  - Luka Milinkovic (Belgrade University, Serbia);
  - Aleksandra Smiljanic (Belgrade University, Polytechnic Institute of NYU, Serbia)
2. ***A New Ranked Hopfield Neural Networks Approach to QoS Parallel Scheduling for WDM Optical Interconnection System***
  - Po-Lung Tien (National Chiao Tung University, Taiwan);
  - Bo-Yu Ke (National Chiao Tung University, Taiwan)
3. ***QoS Parallel Incremental Scheduling for Optical Pseudo-Banyan Packet Switching System***
  - Shih-Hsuan Lin (National Chiao Tung University, Taiwan);
  - Maria C. Yuang (National Chiao Tung University, Taiwan)