R+D AT POZNAN UNIVERSITY OF TECHNOLOGY FACULTY OF ELECTRONICS AND TELECOMMUNICATIONS FOR THE FUTURE INTERNET

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Where are we?

Poznań:

- ~600000 inhabitants
- 1000 years-old city
- commercial, industrial and academic center
- more than 10 schools on the university level

Poznań

Poznan University of Technology

- Established in 1919 as the school of mechanical engineering
- Full university rights since 1955
- Currently 9 faculties:
  - Architecture
  - Civil Engineering and Environmental Protection
  - Mechanical Engineering and Management
  - **Electronics and Telecommunications**
  - Electrical Engineering
  - Technical Physics
  - Computer Science and Management
  - Machines and Transportation
  - Chemical Technology

Faculty of Electronics and Telecommunications

- Established in October 2006 on the basis of the Institute of Electronics and Telecommunications existing since 1974
  - Four Chairs (Departments):
    - Chair of Multimedia Communications and Radioelectronics
    - Chair of Communication Systems and Optoelectronics
    - Chair of Wireless Communications
    - **Chair of Communication and Computer Networks**

Chair of Multimedia Communications and Radioelectronics

- Head: Prof. Marek Domański
- Areas of expertise:
  - Audio and video compression
  - Audio and video codec development - software and hardware (FPGA etc.)
  - Image and video processing
  - Digital television, interactive television, free-view tv
  - Digital video surveillance
  - Medical image processing
  - Audio processing
  - IP cores development
  - FPGA programming
  - Design for FPGA and ASIC

Chair of Multimedia Communications and Radioelectronics

- International Research Projects:
  - EU-founded research: MASCOT project
  - Bilateral research projects: VUB Brussels
  - NATO – founded research co-operation
  - Foreign-industry-founded activities (with HHI Berlin, Mitsubishi Electric).
- International standardization activities in multimedia: over 10 contributions to MPEG (ISO) and JVT (ISO + ITU).

Chair of Communication Systems and Optoelectronics

- Head: Prof. Ryszard Stasiński
- Areas of expertise:
  - EDFA amplifiers
  - discretely tuned optical filter
  - optical sources
  - SAW elements
  - cryogenic electronics
  - quantum metrology
  - distributed computer measurement systems
  - conductance in nanowires/nanostructures
  - DSP in measurement systems
  - lossless coding
  - synchronization of communication systems
  - time and frequency quality assesment

Chair of Communication Systems and Optoelectronics

Significant practical experience – construction of synchronization equipment for Polish market

Chair of Wireless Communications

- Head: Prof. K. Wesołowski
- Areas of expertise:
  - E-learning
  - MAC protocols for WLAN applications
  - Space-Time Coding and modulation: BI-STCM-ID
  - Test data volume compression
  - Logic built-in self-test (BIST)
  - Memory BIST
  - Fault diagnosis in scan-based designs
  - Test response compaction
  - Arithmetic BIST
  - Adaptive receivers
  - Data transmission techniques
  - Wireless systems implementation in Software Defined Radio technology

Chair of Wireless Communications

- Participation in FP6 projects:
  - WINNER (https://www.ist-winner.org), NEWCOM (https://newcom.ismb.it), URANUS – STREP (https://project.ist-uranus.org)
- Participation in FP7 projects:
  - NEWCOM++ Network of Excellence in Wireless Communications, continuation of the FP6 network
  - GALAPAGOS - GALileo-bAsed seamless and robust Positioning Applications for loGistics Optimization proceSses – Collaborative Project
- CELTIC/EUREKA projects:
  - WINNER+ - the third phase of the WINNER project devoted to 4G radio access system proposal

Chair of Communication and Computer Networks

- Head: Prof. M. Stasiak
- Traffic and routing team (prof. M. Stasiak)
  - Areas of expertise:
    - Models of separated links with various capacity
    - Switching network model for point-to-point and point-to-group connections that is offered multicast traffic streams
    - Models of a switching network with bandwidth reservation and multicast connections
    - Cell models for new generation mobile networks, including UMTS

Chair of Communication and Computer Networks

- Optical switching group (prof. W. Kabaciński)
  - Areas of expertise:
    - Architectures of switching fabrics
    - Control algorithms for photonic switching fabrics
    - Banyan-type switching fabrics with unicast connections
    - Banyan-type switching fabrics with multicast connections
    - Packet Switch Architectures and Scheduling Algorithms
    - Packet switch with Multiple Output Queuing (MOQ)
    - Packet scheduling algorithms for VOQ single-stage (crossbar) and multi-stage (Clos-type) switches

Chair of Communication and Computer Networks

- Participation in FP6 projects:
  - e-Photon/ONe+ Network of Excellence - as a collaborating institution (http://www.e-photon-one.org)
- Participation in FP7 projects:
  - BONE Network of Excellence - continuation of the e-Photon/ONe+ network (http://www.ict-bone.eu)
- COST Actions:
  - 291 – Towards Digital Optical Networks
  - 293 – Graphs and Algorithms in Communication Networks

Chair of Communication and Computer Networks

- Other activities:
  - Prof. Kabaciński
    - Officer of IEEE Communication Society - Technical Committee Communication Switching and Routing (secretary, vice chair, chair)
    - IEEE ICC 2009 TPC Co-Chair
  - Dr. Danilewicz
    - IEEE 2011 TPC co-chair of Optical Networks and Systems Symposium
    - Chair of IEEE Communication Poznań Chapter
    - Member of Polish Ministry of Science and Higher Education Task Group for evaluating polish projects in Operational Programme - Innovative Economy

Recent Publications

- 2009
  - W. Kabaciński, J. Chen, G. Danilewicz, J. Kleban, M. Spyropoulou, I. Tomkos, E. Varvarigos, K. Vlachos, S. Węclewski, L. Wosinska. K. Yiannopoulos: *Novel Switch Architectures* [in:] Towards Digital Optical Networks. COST Action 291 Final Report. Series: Lecture Notes in Computer Science. Computer Communication Networks and Telecommunications, Vol. 5412. Springer.
  - G. Danilewicz: *Wide-Sense Nonblocking Multicast $log_d(N,m,p)$ Switching Networks Under the Window Algorithm*. IEEE Transactions on Communications, accepted for publication.

Recent Publications

- 2008
  - G. Danilewicz, W. Kabaciński, M. Michalski, M. Żal: *A New Control Algorithm for Wide-Sense Nonblocking Multiplane Photonic Banyan-Type Switching Fabrics With Zero Crosstalk*. IEEE Journal on Selected Areas in Communications, vol. 26, issue 3, part 2, April 2008, 54–64.
  - G. Danilewicz, W. Kabaciński, M. Żal: *Reduced Banyan-Type Multiplane Rearrangeable Switching Networks*. IEEE Communications Letters, vol. 12, no. 12, December 2008, 900-902.
  - Carla Raffaelli, Kyriakos Vlachos, Nicola Andriolli, Dimitrios Apostolopoulos, Jakob Buron, Ruth van Caenegem, Grzegorz Danilewicz, Jorge. M. Finochietto, Joan Garcia- Haro, Dimitrios Klonidis, Mike O'Mahony, Guido Maier, Achille Pattavina, Pablo Pavon: *Photonics in Switching: Architectures, Systems and Enabling Technologies. Computer Networks*, Special Issue: Challanges and Opportunities in Advanced Optical Networking vol. 52, issue 10, July 2008, 1873-1890.

Recent Publications

- 2007
  - G. Danilewicz: *Wide-Sense Nonblocking $Log_d(N, 0, p)$ Multicast Switching Networks*. IEEE Transactions on Communications, vol. 55, no. 11, Nov. 2007, 2193–2200.
- 2006
  - G. Danilewicz, W. Kabaciński: *Comments on „Wide-Sense Nonblocking Multicast Log2(N, m, p) Networks”*. IEEE Transactions on Communications, vol. 54, no. 6, June 2006, 980-982.
  - W. Kabaciński, M. Michalski: *The Routing Algorithm and Wide-Sense Nonblocking Conditions for Multiplane Baseline Switching Networks*. IEEE Journal on Selected Areas in Communications, vol. 24, no. 12, December 2006.
- Other publications – please refer to http://et.put.poznan.pl

Contact

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