

## Personal information

- Born on July 18, 1978, a Polish citizen
- Married with two children to Bożena Woźna-Szcześniak
- Email address: irek@irkos.org
- Objective: carving a research career in telecommunications and computer science

## Education

- **October 2002 - July 2009** PhD degree in Computer Science from the Institute of Theoretical and Applied Informatics of the Polish Academy of Sciences; thesis entitled “A method for performance evaluation of optical packet-switched networks”
- **September 2006** Third EuroNGI Summer School 2006
- **September 2005 - May 2006** Networks Laboratory, University of California, Davis, USA, Fulbright Fellowship
- **September 2004** First EuroNGI Summer School 2004
- **September 1997 - June 2002** Computer Science five year course (Polish title *magister inżynier*, an equivalent of MS and BS), Silesian University of Technology, Poland; admitted with the best entrance exam results; graduated with distinction; thesis entitled “Routing algorithms for three dimensional interconnection networks based on the honeycomb mesh”
- **September 1999 - May 2000** Final year at the Computer Science undergraduate course, Socrates Scholarship for outstanding student’s achievements to the Nottingham Trent University, England

## Professional experience

- **October 2009 - present** Working in the group of Prof. Wyrzykowski as a university teacher and researcher at the Częstochowa University of Technology, Częstochowa, Poland
  - Elastic optical networks
  - Optimal graph algorithms
  - Advanced C++ programming
  - Fixed-mobile integration, passive optical networks
  - Concurrent programming, multilayer applications
  - Computer networks and network operating systems
- **October 2013 - September 2016** Worked as a researcher with Prof. Pach at the Department of Telecommunications of the AGH University of Science and Technology in Kraków, Poland, as a recipient of the postdoctoral fellowship from the Polish National Science Centre
  - Elastic optical networks
  - Fixed-mobile integration
- **October 2006 - September 2009** Self-employment, providing professional services in the field of programming and optical communications
  - Working with SONET/SDH and WDM technologies
  - Portable C++ development

- Optical packet switching
- **October 2002 - September 2006**      Worked with Prof. Czachórski as a research assistant at The Institute of Theoretical and Applied Informatics of The Polish Academy of Sciences, Gliwice, Poland
  - Analytical, numerical and simulative evaluation of optical packet-switched networks
  - Programming within the framework of the Omnet++ simulator
- **September 2005 - May 2006**      Worked with Prof. Biswanath Mukherjee as a Fulbright Fellow at the Networks Laboratory, University of California, Davis, USA
  - Evaluation of TCP in optical packet-switched networks
  - Performance evaluation of optical packet switching
- **July 2005 - September 2005**      Worked with Dr. Damon Wischik as a recipient of the Polish-British Young Scientist Award at the University College London, London, UK
  - Evaluation of TCP in optical packet-switched networks
- **March 2005 - June 2005**      Employed as a computer programmer at the Tech-X Corporation, Boulder, USA, working for Prof. John R. Cary and Dr. Svetlana Shasharina
  - Contributed to CoReViz, the Tech-X remote visualization software
  - Implemented a unique feature of grabbing X window images
  - Evaluated and extended the Xj3D viewer
  - Improved UNIX process management
- **December 2003, July 2004**      Working for Prof. Jean-Michel Fourneau at the PRiSM Laboratory, University of Versailles, France
  - Evaluated the performance of deflection routing in  $4 \times 4$  switches
  - Programming within the framework of the Omnet++ simulator
- **July 2003 - October 2003 and July 2002 - September 2002**      Internship as a computer programmer, working for Prof. John R. Cary at the Center for Integrated Plasma Studies of the University of Colorado at Boulder, USA
  - Designed and implemented modules for OpenDX in C++ with STL
  - Maintained the project with Automake, Autoconf and Libtool
  - Used HDF5 and OpenDX
- **July 2001 - September 2001**      Internship as a computer programmer, working for Dr. Alexander Pletzer at the Plasma Physics Laboratory of the Princeton University, Princeton, USA
  - Implemented and improved a program to solve elliptic equations
  - Used the Mathematica and Autoconf tools, C++ and STL
- **July 2000 - August 2000**      Internship as a computer programmer, working for Dr. Jill Burstein at ETS Technologies, Inc., Princeton, USA
  - Implemented various tasks in the PERL language under UNIX
  - Implemented a system for measuring the performance of the LSA system
- **September 1999 - May 2000**      Working on a group project for Dr. Joanna Hartley and Prof. Andrzej Bargiela at the Nottingham Trent University, England
  - Developed a shortest path algorithm for special constraints
  - Programmed in C++ with STL

- **July 1999 - September 1999** Internship as a computer programmer, working for Dr. Jill Burstein at the Research Division at Educational Testing Service (ETS), Princeton, USA
  - Implemented various tasks in the PERL language under UNIX
  - Designed and implemented in PERL CGI a website
- **July 1997 - October 1998** Assistantship under Prof. Andrzej Mitas at the Silesian University of Technology, Poland
  - Implemented a fast Fourier transform in assembler
  - Gave presentations on the Fourier series and abstract algebra
  - Wrote software in C++ for knowledge testing

## Publications

- I. Szcześniak, A. R. Pach, and B. Woźna-Szcześniak, “Performance of interoperator fixed-mobile network sharing,” in *Proceedings of the 21st International Conference on Optical Network Design and Modeling (ONDM)*, May 2017
- I. Szcześniak, A. Gola, A. Jajszczyk, A. R. Pach, and B. Wozna-Szcześniak, “Itinerant routing in elastic optical networks,” *Journal of Lightwave Technology*, vol. 35, pp. 1868 – 1875, May 2017
- B. Woźna-Szcześniak and I. Szcześniak, “On the SMT-based verification of communicative commitments,” *Scientific Issues of Jan Długosz University in Częstochowa, Mathematics*, vol. XXI, pp. 161–187, December 2016
- I. Szcześniak and B. Woźna-Szcześniak, “Adapted and constrained Dijkstra for elastic optical networks,” in *Proceedings of the 20th International Conference on Optical Network Design and Modeling (ONDM)*, May 2016, pp. 200–205
- B. Woźna-Szcześniak and I. Szcześniak, “SAT-based bounded model checking for timed interpreted systems and the RTECTLK properties,” *Scientific Issues of Jan Długosz University in Częstochowa, Mathematics*, vol. XX, pp. 69–81, December 2015
- I. Szcześniak, P. Cholda, A. R. Pach, and B. Woźna-Szcześniak, “Interoperator fixed-mobile network sharing,” in *Proceedings of the 19th International Conference on Optical Network Design and Modeling (ONDM)*, May 2015, pp. 192–197
- B. Woźna-Szcześniak, I. Szcześniak, A. Zbrzezny, and A. Zbrzezny, “Bounded model checking for weighted interpreted systems and for flat weighted epistemic computation tree logic,” in *PRIMA 2014: Principles and Practice of Multi-Agent Systems*, ser. Lecture Notes in Computer Science. Springer, 2014, vol. 8861, pp. 107–115
- I. Szcześniak, A. Jajszczyk, and A. Pach, “Mobile routing in elastic optical networks,” in *IEEE/CIC International Conference on Communications in China*, October 2014, pp. 107–111
- I. Szcześniak, “Postępy optycznej komutacji pakietów,” *Studia Informatica*, vol. 34, no. 3, pp. 103–116, 2013, presented at XX Konferencja Sieci Komputerowe
- I. Szcześniak and R. Wyrzykowski, “Optical interconnection networks with time slot routing,” *Theoretical and Applied Informatics*, vol. 25, no. 1, pp. 41–48, July 2013
- —, “An optical interconnection network with wavelength time slot routing,” in *Proceedings of the 17th International Conference on Optical Network Design and Modeling (ONDM)*, April 2013, pp. 200–204
- I. Szcześniak, “Emulation of heavily-loaded optical buffers,” Conference on Applications of Algebra in Logic and Computer Science XVII, Zakopane, Poland, March 2012
- —, “Evaluation of a method for enumerating the most probable packet arrangements,” *Scientific Issues of Jan Długosz University in Częstochowa, Mathematics*, vol. 16, pp. 147–152, December 2011

- I. Szcześniak, B. Mukherjee, and T. Czachórski, “Approximate analytical performance evaluation of synchronous bufferless optical packet-switched networks,” *IEEE/OSA Journal of Optical Communications and Networking*, vol. 3, no. 10, pp. 806–815, October 2011
- I. Szcześniak, “Accuracy evaluation of a method for calculating routing probabilities,” Conference on Applications of Algebra in Logic and Computer Science XVI, Zakopane, Poland, March 2011
- —, “Overview of optical packet switching,” *Theoretical and Applied Informatics*, vol. 21, no. 3-4, pp. 167–180, December 2009
- I. Szcześniak, T. Czachórski, and J.-M. Fourneau, “Packet loss analysis in optical packet-switched networks with limited deflection routing,” *Photonic Network Communications*, vol. 16, no. 3, pp. 253–261, December 2008
- I. Szcześniak and T. Czachórski, “Performance evaluation of a bufferless packet-switched node,” in *Proceedings of the Ninth International Conference on Transparent Optical Networks, ICTON 2007*, vol. 3, July 2007, pp. 117–120
- I. Szcześniak and M. Sobczak, “Wydajność użycia funktorów z biblioteką STL języka C++,” in *Pingwinaria*, April 2005
- I. Szcześniak and T. Czachórski, “Oprogramowanie OPUS do oceny wydajności sieci komunikacyjnych z optycznym przełączaniem pakietów,” in *Wysokowydajne sieci komputerowe: nowe technologie*, S. Węgrzyn, B. Pochopień, and T. Czachórski, Eds. WKŁ, 2005, pp. 213–219, presented at XII Konferencja Sieci Komputerowe
- I. Szcześniak, J.-M. Fourneau, and T. Czachórski, “Preliminary results of packet loss analysis in optical packet-switched networks with limited deflection routing,” in *Proceedings of the Symposium on the Applications and the Internet Workshops, SAINT Workshops 2005*, January 2005, pp. 296–299
- I. Szcześniak, “Analysis of a finite number of deflections in fully and uniformly loaded regular networks,” in *Proceedings of NETWORKING 2004*, ser. Lecture Notes in Computer Science, vol. 3042/2004, May 2004, pp. 675–686
- I. Szcześniak and J. R. Cary, “DXHDF5: a software package for importing HDF5 physics data into OpenDX,” *Computer Physics Communications*, vol. 164, no. 1-3, pp. 365–369, 2004, presented at the 18th International Conference on Numerical Simulation of Plasmas, Massachusetts, USA
- I. Szcześniak, “The hive network and its routing algorithm,” *Archiwum Informatyki Teoretycznej i Stosowanej*, vol. 16, no. 3, pp. 171–179, 2004
- —, “Internetowy system informacji o seminariach,” in *Współczesne problemy sieci komputerowych: zastosowanie i bezpieczeństwo*, A. Kwiecień and A. Grzywak, Eds. WNT, 2004, pp. 71–75, presented at XI Konferencja Sieci Komputerowe
- —, “Deflection routing with hamiltonian cycles,” *Studia Informatica*, vol. 24, no. 4, pp. 251–257, 2003, presented at X Konferencja Sieci Komputerowe
- A. Łączny, A. Szarowicz, and I. Szcześniak, “Environmentally oriented travel advisor,” in *Proceedings of the ICAMES 2000*, May 2000
- I. Szcześniak, “Matematyka w grafice,” *PC Kurier*, no. 17, pp. 105–109, August 1997

## Achievements

- 2015 Group Award of the Rector of the Technical University of Częstochowa (for the creation of the optical network laboratory)
- 2013 Postdoctoral fellowship, Polish National Science Centre
- 2005 Fulbright fellowship
- 2005 Polish-British Young Scientist Award, British Council

- 2004 Travel grant, Foundation for Polish Science
- 2002 Graduated cum laude from University
- 2001 The Minister of Higher Education of Poland Award for academic achievement
- 2000 Accepted to CERN as a summer student
- 2000 The Dean Prize for the best student, Silesian University of Technology
- 1997-2002 University academic scholarship, Silesian University of Technology
- 1997 The Minister of Education of Poland Award, “Europe in School” competition
- 1996 The Minister of Education of Poland Award, “Europe in School” competition
- 1993 My computer game “Electra” bought by software company LK Avalon

## Projects

- As a project leader:
  - Software-defined integration of elastic optical networks and cognitive wireless networks in the context of packet services, Polish National Science Center, nr UMO-2013/08/S/ST7/00576, 2013-2016
  - Optical packet switching for inter-processor and inter-node communication, Częstochowa University of Technology, nr BS/MN-1-112-302/2012/P, 2012-2013
  - Hardware emulation of small optical buffers, Częstochowa University of Technology, nr BS/MN 1-112-303/11/P, 2011-2012
- As a chief researcher:
  - A method for performance evaluation of optical packet-switched networks, Polish Ministry of Science and Higher Education, PhD grant, nr 3 T11C 036 29, 2005-2007
- As a researcher:
  - Models of transmission dynamics, congestion control and quality of service in the Internet, Polish Ministry of Science and Higher Education, nr N N516 479640, 2011-2014
  - Methods and models for congestion control and performance evaluation of the quality of service mechanisms in the next-generation Internet, Polish Ministry of Science and Higher Education, nr N517 025 31/2997, 2005-2008
  - Euro-NGI: Design and Engineering of the Next Generation Internet – Towards convergent multi-service networks, European Commission, nr 507613, 2003-2006

## Professional Service

- As a TPC member:
  - Optical Network Design and Modeling (ONDM): 2014
  - Parallel Processing and Applied Mathematics (PPAM): 2013
- As a journal reviewer:
  - IEEE/OSA Journal of Optical Communications and Networking (JOCN): 2012 - 2013, 2015
  - IEEE Communications Magazine: 2013
  - OSA Optics Express: 2014-2016
  - Transactions on Emerging Telecommunications Technologies (ETT): 2014
  - Photonic Network Communications: 2014, 2017
  - Journal of Computing and Information Technology (CIT): 2015

- Theoretical and Applied Informatics (TAAI): 2013
- Wiley’s Networks: 2017
- As a conference reviewer:
  - International Conference on Communications (ICC): 2013, 2014, 2016
  - Global Communications Conference (GLOBECOM): 2013
  - Optical Network Design and Modeling (ONDM): 2013, 2014, 2017
  - Design of Reliable Communication Networks (DRCN): 2013, 2014, 2016
  - Networking: 2014
  - Networks: 2016
  - Parallel Processing and Applied Mathematics (PPAM): 2009, 2011, 2013
  - Advanced Networks and Telecommunications Systems (ANTS): 2013
  - International Teletraffic Congress (ITC): 2014
  - Reliable Networks Design and Modeling (RNDM): 2015-2016
  - European Conference on Networks and Optical Communications (NOC): 2013
  - International Microwave and Optoelectronics Conference (IMOC): 2013

## Teaching experience

- Multilayer applications (lectures and lab classes, 2016-2017)
- Advanced C++ programming (lectures and lab classes, 2016-2017)
- Optical networks (lectures and lab classes, 2011-2013)
- Network operating systems (lectures and lab classes, 2009-2013)
- Computer networks (lectures and lab classes, 2009-2013)
- Cross-platform network applications (lab classes, 2011-2012)
- Parallel and distributed programming (lab classes, 2009-2013)
- Computer system virtualization (lectures and lab classes, 2012)
- Group project (2010-2011)

## Memberships

- Polish Tex Users Group (GUST), since 2009
- Polish Fulbright Alumni Association, since 2010
- IEEE Communications Society, 2008-2015
- Polish Linux Users Group (PLUG), since 2010

## Interests

- Optical networks, fixed-mobile integration
- Optimal graph algorithms
- C++ programming, algorithms, Unix
- Telecom and computer networks
- Analytical and simulative performance evaluation

## Skills

- Languages: C++, C, Java, Python, Perl, XHTML, XSL, CSS
- Technologies: EON, WDM, OTN, SONET/SDH, OPS, OBS, IP
- Platforms: Linux/GNU, OpenWRT, OpenBSD, Windows, Cygwin, AIX
- Tools:
  - L<sup>A</sup>T<sub>E</sub>X, Emacs, Gnuplot, PGF/TikZ, Xfig, GWT
  - GNU Make, GCC, VS++, GNU Autotools, HDF5, Boost, GSL
  - OMNeT++, SP Guru Transport Planner, Mathematica
  - QEMU, Xen, VirtualBox
- Fluent spoken and written English