

Ziad A. El-Sahn, Ph.D.

E-mail: ziad.elsahn@ieee.org | Mobile: +1 (613) 762-2619 | Website: <http://eng.staff.alexu.edu.eg/~zelsahn/>

Passionate about building a better future through research and development. An accomplished engineer and research scientist with strong analytical and problem solving skills, adaptability to project needs, and a breadth of international experience. A personable colleague who builds enduring working relationships with internal and external stakeholders. An organized and self-motivated leader who thrives in both independent and group work environments. A technology enthusiast who seeks new challenges in a fast-paced business environment whether in academia or in industry.

Personal Information

Marital Status: Married
Nationality: Egyptian - Canadian
Date of Birth: November 22, 1979

Key Competencies

- Problem solving by delivering innovative, results-oriented solutions to complex and open-ended questions
- Multi-disciplinary technical knowledge encompassing photonics, electrical engineering and applied physics
- Hands-on laboratory experience designing, building and validating fiber optic networks with high-speed optoelectronic transceivers
- Cross-functional collaboration demonstrated through local and international partnerships with academic and industry stakeholders
- Excellent research proposal writing skills with the ability to managing research teams and funded projects
- Communication with experience writing and publishing documents in top-tier technical journals and presenting at industry conferences
- Experience in leadership, mentorship, and student life groups/activities

Technical Skills

- Strong knowledge of optical communications and optoelectronic components for optical transceivers
- System-level engineering of novel optical communication systems with digital signal processing and advanced modulation formats
- Designing, building, characterizing, and optimizing fiber optic test-beds using state-of-the-art laboratory equipment
- Implementing analytical models, test automation, data acquisition, and analysis
- Strong Matlab programming skills

Education

- Ph.D. in Electrical Engineering** 2005 - 2010
Department of Electrical and Computer Engineering, Laval University, Quebec City, QC, Canada
- Advisor: Prof. Leslie A. Rusch
 - Thesis: Smooth Upgrade of Existing FTTH Access Networks: SAC-OCDMA and Dense SS-WDM Solutions
- M.Sc. in Electrical and Communication Engineering** 2002 - 2005
Department of Electrical Engineering, Alexandria University, Alexandria, Egypt
- Advisors: Prof. Hossam M. H. Shalaby, and Prof. El-Sayed A. El-Badawy
 - Thesis: Random Access Protocols for Future Optical CDMA Networks
- B.Sc. in Electrical and Communication Engineering** 1998 - 2002
Department of Electrical Engineering, Alexandria University, Alexandria, Egypt
- Distinction with Degree of Honor (87.3347%) - Ranked 3rd over a class of 316 students
 - Graduation Project: 3G Multimedia Mobile Communications

Professional and Work Experience

- Sr. Optical Systems Designer** 2017 - Present
Infinera, Ottawa, ON, Canada
- Work on Infinera's next generation optical transmission system with the ASIC and Firmware team including system design of modern optical coherent modem
 - Investigate various methods to improve the capacity and reach of current and next generation optical transmission systems, e.g. coded modulation, constellation shaping, nonlinear compensation, Tx pre-compensation

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- Assistant Professor** [on leave since July 2017] 2012 - 2017
Department of Electrical Engineering, Alexandria University, Alexandria, Egypt
- Developed and taught undergraduate courses on Optical Communications and Devices, Communication Systems, and Mobile and Wireless Communications
 - Supervised M.Sc. and Ph.D. graduate students
 - Research: Fiber-to-the-Home and Passive Optical Networks, Visible Light Communications, Optical OFDM for IM/DD Applications, Advanced DSP for Optical Communication Systems, Space-Division Multiplexing
 - Supervised senior graduation projects on visible light communication (VLC) applications, design of fiber-to-the-home networks, and PON monitoring using MEMS technology
 - Founded the Photonics Group at Alexandria University jointly with other professors
 - Participated in the development and design of new courses, study bylaws, faculty strategic plan ... etc.
- Adjunct Assistant Professor** Spring 2017
Department of Communications and Information Engineering, Zewail City of Science and Technology, Sheikh Zayed, Giza, Egypt
- Taught an undergraduate course on Information Theory and Coding
- Adjunct Assistant Professor** Spring 2015
School of Communications and Information Technology, Nile University, Sheikh Zayed, Giza, Egypt
- Taught a graduate course on Queuing Theory and Fundamentals of Networking
- Adjunct Assistant Professor** 2013 - 2015
Department of Electrical Engineering, Pharos University, Alexandria, Egypt
- Taught undergraduate courses on Analog Communications, and Communication Technology for Power Engineers
- Postdoctoral Research Fellow** 2010 - 2012
Department of Electrical and Computer Engineering, McGill University, Montreal, QC, Canada
- Advisor: Prof. David V. Plant
 - Research Project: High Bit Rate Optical Access Networks, Bell Canada and Nortel
- Technology Consultant** 2010 - 2011
Bell Canada, Montreal, QC, Canada
- Member of a collaborative project between McGill University and Bell Canada to facilitate a smooth rollout of the Fibe service
 - Developed and delivered a software tool to estimate the bandwidth usage of Fibe customer services (Internet, IPTV, VoIP) for growth forecasting and network hardware provisioning
 - Consulted on the evolution of optical access network technologies beyond current industry standards
- Research Associate** 2009 - 2010
Department of Electrical and Computer Engineering, McGill University, Montreal, QC, Canada
- Advisor: Prof. David V. Plant
 - Research Project: Access Network Technologies, Bell Canada
- Research and Teaching Assistant** 2005 - 2009
Department of Electrical and Computer Engineering, Laval University, Quebec City, QC, Canada
- Research Project: Examining the use of CDMA for optical access networks, TELUS
 - Assisted in teaching courses on Analyze des signaux, and Réseaux de transmission de données
- Teaching Assistant, Part-Time** 2003 - 2005
Department of Electrical Engineering, Arab Academy for Science & Technology, Alexandria, Egypt
- Assisted in teaching courses on Communication Systems, Communication Networks, Solid State Devices, Electronic Measurements
- Research and Teaching Assistant** 2002 - 2005
Department of Electrical Engineering, Alexandria University, Alexandria, Egypt
- Research Project: Studying random access protocols in optical CDMA networks
 - Assisted in teaching courses on Communication Systems, Optical Devices and Engineering, Microwave and Optical Transmission Media, Microprocessors Interfacing and Applications, Electronic Measurements, Semiconductor Devices, Modern Physics, Acoustics
- Summer Intern** Summer 2001
Schlumberger (Wireline), Shukeir, Egypt

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Summer Intern

Federal Arab Maritime Company (FAMCO), Alexandria, Egypt

Summer 2000

Summer Intern

Arabia Computer Systems (ACS), Alexandria, Egypt

Summer 1999

Training Courses and Certificates

- Use of Global Databases, Faculty and Leadership Development Center (FLDC), Alexandria University, May 2017
- Research Ethics and Plagiarism, Faculty and Leadership Development Center (FLDC), Alexandria University, May 2017
- Designing and Developing the Digital Content, Faculty and Leadership Development Center (FLDC), Alexandria University, April 2017
- The Credit Hours System, Faculty and Leadership Development Center (FLDC), Alexandria University, January 2017
- Managing Time and Meetings, Faculty and Leadership Development Center (FLDC), Alexandria University, January 2017
- Managing Research Teams, Faculty and Leadership Development Center (FLDC), Alexandria University, January 2017
- Competitive Research Proposal Writing, DAAD Kairo Akademie, Module PP-05, Alexandria University, October 2015
- Silicon Photonics Fabrication Workshop: Introduction to Silicon Photonics Device Design and Fabrication, La Jolla, California, USA, October 2014
- How to Develop a Project Proposal, Alexandria Research Center for Adaptation, Alexandria, December 2013
- Writing Successful Grants, SmartCI Research Center, VTMENA, Alexandria University, October 2013
- University Legal and Financial Aspects, Faculty and Leadership Development Center (FLDC), Alexandria University, December 2012
- Competitive Research Projects, Faculty and Leadership Development Center (FLDC), Alexandria University, September 2012
- Effective Presentation Skills, Faculty and Leadership Development Center (FLDC), Alexandria University, September 2012
- International Publishing of Research, Faculty and Leadership Development Center (FLDC), Alexandria University, September 2012
- References Management Systems, Faculty and Leadership Development Center (FLDC), Alexandria University, September 2012
- Student Evaluation and Examination Techniques, Faculty and Leadership Development Center (FLDC), Alexandria University, August 2012
- Learning to Teach Day (LTT) Workshop, McGill University, March 2012
- Workplace Hazardous Materials Information System (WHMIS) Training, McGill University, September 2010
- High Speed Oscilloscope Training (LeCroy Corporation), McGill University, April 2010
- La Fibre Optique à la Maison (EXFO), Invited talk at Laval University, November 2008
- Attestation de Sécurité Laser, Laval University, February 2008
- Fiber to the Home (EXFO), SYTACom Workshop, Quebec City, April 2007
- Passive Optical Networks: Bringing Fiber to the Home (EXFO), Photonics North, Quebec City, June 2006
- FTTx Solutions and PONs (EXFO), SYTACom Workshop, Montreal, May 2006
- Formation SIMDUT (Système d'Information sur les Matières Dangereuses Utilisées au Travail), Laval University, September 2005

Research and Publications Record

Research Experience

- Over more than 16 years of experience in high quality research in optical communications
- Current research areas include: space-division multiplexing (SDM), digital signal processing (DSP), coherent optical communications, fiber-to-the-home (FTTH) access networks, optical orthogonal frequency-division multiplexing (OFDM), visible light communication (VLC) technology, silicon photonics and integration, ... etc.
- Previous research areas include: optical code-division multiple-access (OCDMA), wavelength-division multiplexing (WDM), interleave-division multiple-access (IDMA), design of MAC layer protocols for optical networks, ... etc.
- Principal investigator of a funded research project by STDF: New Technologies for Fiber-to-the-Home Access Networks, EGP 998,840.00, November 2015

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- Supervised and co-supervised 1 Ph.D. and 10 M.Sc. students, currently supervising 3 M.Sc. and 1 Ph.D. students

Publications Record

- Published more than 24 high impact journal papers and more than 50 international conference papers, since 2005
- Scopus – *h*-index: 10, total citations: 327
- Google Scholar – *h*-index: 11, total citations: 403, highly cited: 51
- Top cited papers according to Google Scholar:
 - [1] J. Penon, **Z. A. El-Sahn**, L. A. Rusch, and S. LaRochelle, "Spectral-amplitude-coded OCDMA optimized for a realistic FBG frequency response," *IEEE J. Lightwave Technol.*, vol. 25, no. 5, pp. 1256-1263, May 2007.
 - [2] **Z. A. El-Sahn**, B. J. Shastri, M. Zeng, N. Kheder, D. V. Plant, and L. A. Rusch, "Experimental demonstration of a SAC-OCDMA PON with burst-mode reception: local versus centralized sources," *IEEE J. Lightwave Technol.*, vol. 26, no. 10, pp. 1192-1203, June 2008.
 - [3] Q. Zhuge, M. Morsy-Osman, X. Xu, M. E. Mousa-Pasandi, M. Chagnon, **Z. A. El-Sahn**, and D. V. Plant, "Pilot-aided carrier phase recovery for M-QAM using superscalar parallelization based PLL," *Opt. Express*, vol. 20, no. 17, pp. 19599-19609, August 2012.
 - [4] **Z. A. El-Sahn**, W. Mathlouthi, H. Fathallah, S. LaRochelle, and L. A. Rusch, "Dense SS-WDM over legacy PONs: Smooth upgrade of existing FTTH networks," *IEEE J. Lightwave Technol.*, vol. 28, no. 10, pp. 1485-1495, May 2010.
 - [5] Q. Zhuge, X. Xu, **Z. A. El-Sahn**, M. E. Mousa-Pasandi, M. Morsy-Osman, M. Chagnon, M. Qiu, and D. V. Plant, "Experimental investigation of the equalization-enhanced phase noise in long haul 56 Gbaud DP-QPSK systems," *Opt. Express*, vol. 20, no. 13, pp.13841-13846, June 2012.

Patents

- [1] W. Mathlouthi, L. A. Rusch, P. Lemieux, **Z. A. El-Sahn**, and H. Fathallah, "Transmitter and receiver for optical communication systems," *World Intellectual Property Organization (WIPO)*, Ref. WO 2008/141442 A1, November 2008.

Awards Received

- University Incentive Award in Engineering Sciences, Alexandria Egypt, Egypt, 2016
- State Incentive Award in Engineering Sciences, Academy of Scientific Research and Technology, Egypt, 2015
- Alexandria University Award of Scientific Publication in Highly Ranked Journals, 2012 - 2014, 2016
- Corning Outstanding Student Paper Competition, Semi-finalist, Paper NTh4F.1, Optical Fiber Communication (OFC), March 2013
- Bourse d'exemption de droits de scolarité supplémentaires pour les étudiants étrangers, Laval University, September 2005 - September 2009
- Alexandria University Award of Scientific Publication in Highly Ranked Journals, 2007, 2008
- Best Paper Award, IEEE Egyptian Student Branch Contest, AAST, Cairo, Egypt, January 2005
- Degree of Honor of Cumulative Academic Distinction, Faculty of Engineering, Alexandria University, June 2002
- Academic Distinction Award, Faculty of Engineering, Alexandria University, 1998 - 2002
- Academic Distinction Award, College Saint-Marc, Alexandria, Egypt, 1984 - 1997

Professional Memberships

- Member of the URSI-National Radio Science Committee (URSI-NRSC) 2016 - 2017
- Member at Smart Critical Infrastructure (SmartCI) Center at Alexandria University since 2012
- Member of the Egyptian Engineering Syndicate since 2002
- IEEE Organization (Valued IEEE member since 1998, Senior Member: 2015)
- Reviewer for IEEE, OSA, Elsevier and IET Journals:
 - IEEE Journal of Lightwave Technology (JLT)
 - IEEE Photonics Technology Letters (PTL)
 - IEEE/OSA Journal of Optical Communications and Networking (JOCN)
 - OSA Optics Express (OE)
 - Elsevier, Optics Communications
 - Elsevier, Optik – International Journal for Light and Electron Optics (IJLEO)
 - IET Communications
 - IET Electronics Letters
 - Elsevier, Alexandria Engineering Journal (AEJ)
 - Tubitak, Turkish Journal of Electrical Engineering and Computer Sciences

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- Reviewer for Conferences:
 - IEEE Lasers and Electro-Optics Society (LEOS)
 - IEEE International Conference on Telecommunications (ICT)
 - IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunications Systems (MASCOTS)
 - International Japan-Egypt Conference on Electronics, Communications and Computers (JEC-ECC)
 - National Radio Science Conference (NRSC)
- Conference Committees:
 - Chair of the Next Generation Systems and Networks Symposium, 13th International Wireless Communications & Mobile Computing (IWCMC) Conference, Valencia, Spain, 2017
 - Member of the organizing and technical program committees of the 34th National Radio Science Conference (NRSC), Arab Academy for Science, Technology and Maritime Transport (AASTMT), Port Said Campus, Port Said, Egypt, 2017
 - Member of the organizing committee of the Healthcare Support through Information Technology Enhancements (hSITE) Annual Research Review, Montreal, QC, Canada, June 2010
 - Member of the technical program committee of the 11th World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI), Orlando, Florida, USA, July 8-11, 2007

Language and Computer Skills

- Languages: Arabic (native), French (very good), and English (very good)
- Computer: Programming (Matlab, C++), Microsoft Office, Windows

Extracurricular Activities

- Counselor, IEEE Alexandria Subsection, Student Activities, 2015 - Present
- Founder and Member, Photonics Group at Alexandria University, Alexandria, Egypt, 2014 - Present
- Member, Association des Diplômés de l'Université Laval (ADUL), Canada, 2010 - Present
- Supervisor, Photonics Lab, Alexandria University, Alexandria, Egypt, 2012 - 2017
- Founder and Advisor, Egypt Scholars Alexandria University Student Chapter, Egypt, 2013 - 2015
- Advisor, Engineering Web (E-WEB) Scientific Organization, Alexandria University, Egypt, 2012 - 2015
- Advisor, Start Menu Union (SMU) Organization, Alexandria University, Egypt, 2012 - 2015
- Member, Post-Graduate Students' Society (PGSS), McGill University, Canada, 2010 - 2012
- Treasurer, Association des Étudiants Musulmans de l'Université Laval (AÉMUL), Canada, 2007 - 2008
- Scout, College Saint-Marc, Alexandria, Egypt, 1990 - 1994

Interests and Activities

- Communication & Electronics, Photonics
- Sports: tennis, basketball, volleyball and swimming
- Scout, Traveling and Social Relationships

References

- Available upon request