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TECHNICAL SPECIALITY:

Wireless Communications, Cellular and Mobile Communications, Spread Spectrum and Code Division Multiple Access (CDMA), Synchronization, Orthogonal Frequency Division Multiplexing and Multiple Access (OFDM, OFDMA), Digital Signal Processing.

EDUCATION

Ph.D. Electrical Engineering, Southern Methodist University, Dallas, Texas, May 1990
M.Sc. Electrical Engineering, Alexandria University, Alexandria, Egypt, 1986
B.Sc. Electrical Engineering, Alexandria University, Alexandria, Egypt, 1982

EXPERIENCE

- **Teaching:** Teaching numerous graduate and under graduate classes including: Adaptive signal processing, digital communications, communications systems, digital signal processing, logic circuit design, electromagnetics, mobile communications, C programming, Logic circuits.
- **Research:** Conducted research on many wireless communications topics and mobile communications systems as shown in the list of papers and patents below. Having a mix of academic research and industry experience as shown in the industry experience list below. Current focus is on LTE and 5G cellular systems.
- **Master and Ph.D. Supervision:** Supervised more than 30 Alexandria University graduate students for Master and Ph.D. degrees.
- **Industry Experience:** Ericsson Inc., USA; Ellipsis Digital System, USA; BNR, USA; MIMOS, Malaysia; Sysdsoft, Egypt; Axxcelera, Egypt.

Alexandria University: From December 1, 2012 to September 24, 2014:

Vice Dean for Education and Student Affairs, Faculty of Engineering, Alexandria University, Alexandria, Egypt. Responsible for curriculum development and implementation, student registration, class schedule, school exams, etc.

Alexandria University: From 1991 to date:

Currently Professor, Alexandria University, Faculty of Engineering, Dept. of Electrical Engineering, Alexandria, Egypt. Teaching graduate and undergraduate courses on digital signal processing, communications theory and systems, spread spectrum, mobile communications and many others.

Keio University: January 18 to April 18, 1996

Visiting researcher, Nakagawa Laboratory, **Dept. of Electrical Engineering, Keio University, Yokohama, Japan.** Conducting research on decentralized inter-vehicle synchronization for the Intelligent Vehicle-Highway System.

Keio University: October 1993 to August 1994

Visiting lecturer and researcher, Nakagawa Laboratory, **Dept. of Electrical Engineering, Keio University, Yokohama, Japan.** Delivered lectures and conducted research on different aspects of CDMA for mobile communications, multi-carrier CDMA and interference cancellation

AWARDS

Recipient of the "Egyptian National Award for Encouragement" for 1995 in the field of Engineering Sciences

RESEARCH GRANTS

Design and Implementation of the Physical Layer of the Long Term Evolution Mobile Communication System with Beamforming Antenna System, From ITIDA, Egypt, grant number ARP2009_R6_7. Started January 2010.

TECHNICAL ACTIVITIES

- Associate editor, Alexandria Engineering Journal (AEJ), Communications and Electronics, from 2012 to date
- Chairman of the IEEE Alexandria Subsection from January 2013 to January 2015.
- Associate Editor for the IEEE Transactions on Vehicular Technology from 2000 to 2006
- Secretary of the IEEE, Vehicular Technology Society from January 1997 to January 2001

- Reviewer for many articles on IEEE Transactions on Vehicular Technology, IEEE Transactions on Communications and IEEE Journal of Selected Areas on Communications and many IEEE conferences.
- Reviewer of several grant proposals for the Information Technology Industry Development Agency (ITIDA) and the Science and Technology Development Fund (STDF) in Egypt
- IEEE Member in the Vehicular Technology Society and Communications Society.
- Many publications and presentations in IEEE conferences
- Chaired a number of sessions in IEEE and IEEE sponsored conferences

INDUSTRY RESEARCH EXPERIENCE (Reverse chronological order)

Sept 2011 to December 2012

AXXCELERA, CAIRO, EGYPT, Consultant

- Directing and supervising the development of all transmitter and receiver algorithms for LTE base station

January 2007 to March 2011

SYSDSOFT, CAIRO, EGYPT, Consultant to DSP team

- Directing and supervising the development of all transmitter and receiver algorithms for mobile WiMAX, LTE and Zigbee wireless systems
- Working on and supervising the porting and optimization on DSP platform
- Supporting RTL development

Summer 2004, Summer 2005 and summer 2006

MALAYSIAN INSTITUTE OF MICROELECTRONIC SYSTEMS (MIMOS), KUALA LUMPUR, MALAYSIA

- Visiting researcher
- Development mobile WiMAX architecture and required algorithms
- Developing Viterbi equalizer, synchronization, frequency offset estimation algorithms
- Supporting the development of other GPRS/EDGE algorithm development

February 1, 2001 to January 15, 2004

ELLIPSIS DIGITAL SYSTEMS, CARLSBAD, CALIFORNIA

- Full time, Director System Engineering,
- Managing and supervising the testing the software design of a System-On-A-Chip for the IEEE 802.11 WLAN
- Supporting VHDL design of the physical layer algorithms of the IEEE 802.11a WLAN.
- Leading research and design of the physical layer of the IEEE 802.11a WLAN system
- Designing algorithms for AGC, Synchronization, Channel Estimation, Frequency offset estimation and Channel Equalization of OFDM systems
- Developing a complete system simulation and generating performance charts under all data rates and several system and channel parameters

August 23, 1996 to January 13, 2001

ERICSSON INC, RESEARCH TRIANGLE PARK, NORTH CAROLINA, USA

- Full time, Senior Research Engineer
- Worked with a team to develop a complete modem simulation for an IS-95 Cellular phone and cooperated with hardware engineers to implement it on an Ericsson chipset
- Developed a complete modem simulation for 3G CDMA modem based on IS-2000 1X and IS-2000 3X taking into consideration all implementation aspects.
- Developed and presented numerous internal CDMA training courses, covering all aspects of Cellular CDMA Systems, from basic introduction to detailed modem design
- Filed, with others, several patents in different aspects of CDMA modem design, 7 of which are already issued (see patent list below)
- Developed advanced CDMA modem algorithms like: initial synchronization, multipath delay tracking, multipath searcher, assigning and re-assigning Rake Receiver Fingers, interference cancellation in Rake receiver, closed loop power control.

January 1990 to July 1991

BELL NORTHERN RESEARCH (NORTEL), RICHARDSON, TEXAS, USA

- Full time: Member of Scientific Staff. Was involved in the following projects:
- Designing computer simulations to assess the capacity of the analog and digital mobile communication systems in different channel conditions and cellular sectorization.
- Assessing the application of CDMA in personal communication systems

- Designing flow graphs and a test plan for the common air interface and call processing based on the TDMA dual mode compatibility standard IS-54
- Assessing dynamic and hybrid channel assignment techniques to increase the capacity of the mobile communication systems

PATENTS

- [1] Essam Sourour, Gregory Bottomley and Rajaram Ramesh, "Delay searcher and delay trackers interaction for new delays assignment to rake fingers," Patent Number 6,560,273 USA, May 6, 2003.
- [2] Essam Sourour, Gregory Bottomley and Rajaram Ramesh, "Modulation sequence synchronization methods and apparatus employing partial sequence correlation" Patent Number:6,421,371 USA ,Jul 16, 2002
- [3] Essam Sourour and Clarence Roberts "Apparatus and methods for receiving information using variable length accumulation searchers" Patent Number:6,377,615 USA April 23, 2002
- [4] Essam Sourour, Gregory Bottomley, David Barrow, Rajaram Ramesh and Clarence Roberts, "Flexible sliding correlator for direct sequence spread spectrum systems," Patent Number 6,363,105, USA, March 26, 2002.
- [5] Gregory Bottomley and Rajaram Ramesh, "Pilot strength measurement and multipath delay searcher for CDMA receiver," Patent Number 6,157,820, USA, December 5, 2000.
- [6] Essam Sourour, Gregory Bottomley and Rajaram Ramesh, "System and method for synchronizing acquisition for code modulated communication system," Patent Number 6,147,982 USA, Nov. 14, 2000.
- [7] Essam Sourour, Greg Bottomley, David Barrow, Rajaram Ramesh and Clarence Robert. "Flexible sliding correlator for direct sequence spread spectrum systems" Patent Number: 66,218,58 USA Sep. 16, 2003
- [8] Jiann-Ching Guey and Essam Sourour, "Delay and channel estimation for multi-carrier CDMA system," Patent Number: 6,876,645, USA April 5, 2005
- [9] Essam Sourour, "Multipath interference reduction for a CDMA system," Patent Number: 6,865,218 USA, March8, 2005
- [10] Essam Sourour; Greg Bottomley; Rajaram Ramesh, Sandeep Chennakeshu, "Method and apparatus for multipath delay estimation in direct sequence spread spectrum communication systems," Patent Number 6,839,378 USA, January 4, 2005
- [11] Essam Sourour, "Selective multi-carrier direct sequence spread spectrum communication systems and methods," Patent Number 6,810,070 USA, October 26, 2004
- [12] Essam Sourour; Roozbeh Atarius; Ali Khayrallah, "Fast forward link power control for CDMA system," Patent Number 6,768,727 USA, July 27, 2004
- [13] Essam Sourour; Greg Bottomley; Rajaram Ramesh, "Delay searcher and delay trackers interaction for new delays assignment to rake fingers," Patent Number 6,891,883 USA, May 10, 2005
- [14] Essam Sourour and Wail Refai, "Amplifier phase change compensation," Patent Number 6,909,884 USA, June 21, 2005
- [15] Essam Sourour, "Methods, systems and apparatus for precompensating for interference among transmitted coded signals," Patent Number 6973063, December 6, 2005
- [16] Wail Refai, Robert C. Witter and Essam Sourour, Push-to-talk and push-to-conference in a CDMA wireless communications system," Patent Number 6,982,961 USA, January 3, 2006
- [17] Essam Sourour, "Systems and methods for reduced forward link power control delay," Patent Number 7,069,034 USA, June 27, 2006
- [18] Essam Sourour, Roozbeh Atarius, and Ali Khayrallah, "Push-to-talk and push-to-conference in a CDMA wireless communications system," Patent Number 7,133,353 USA, November 7, 2006
- [19] Greg Bottomley, Yi-Pin Eric Wang, Essam Sourour and Jian-Ching Guey, "Communications methods, apparatus and computer program products using gain multipliers," Patent Number 7,236,514 USA, June 26, 2007
- [20] Wail Refai and Essam Sourour, "Systems and methods for soft handoff and other diversity communication using base stations supporting common radio configurations," Patent Number 7,295,536 USA, November 13, 2007.

JOURNAL PUBLICATIONS

- [1] Mohamed A. Aboulhassan, Essam A. Sourour, Shawki Shaaban. "Novel Cell Selection Procedure for LTE Hetnets Based on Mathematical Modelling of Proportional Fair Scheduling." International Journal of Wireless & Mobile Networks (IJWMN), Volume 5, No. 6, December 2013
- [2] Said M. Elnoubi, Essam Sourour, and Abbas Elshamly, Performance of Multicarrier CDMA With DPSK Modulation and Differential Detection in Fading Multipath Channels, IEEE Trans. Veh. Tech, VOL. 51, NO. 3, MAY 2002
- [3] E. Sourour and M. Nakagawa, "Mutual decentralized synchronization for inter-vehicle communications," IEEE Trans. Veh. Tech, Vol. 48, No. 6, November 1999, pp. 2015-2027.
- [4] Riaz Esmailzadeh, E. Sourour and M. Nakagawa, "Pre-rake diversity combining in time division duplex CDMA mobile communications," IEEE Trans. Veh. Tech., Vol 48, No. 3, May 1999, pp. 795-801
- [5] Wei Huang, E. Sourour and M. Nakagawa, "Cancellation technique used for DS-SS signal in nonlinear optical link," IEICE Trans. Fundamentals, Vol. E80-A, No. 9, September 1997, pp. 1616-1624.

- [6] Riaz Esmailzadeh, M. Nakagawa and E. Sourour, "Time-Division Duplex CDMA Communications," *IEEE Personal Communication Magazine*, April 1997, pp. 51-56.
- [7] E. Sourour and M. Nakagawa, "Performance of orthogonal multi-carrier CDMA in a multipath fading channel," *IEEE Trans. Com.*, Vol. 44, No. 3, March 1996, pp. 356-367.
- [8] Y. Murata, R. Esmailzadeh, K. Takakusaki, E. Sourour and M. Nakagawa, "Path diversity for FFH/PSK spread spectrum communication systems," *IEEE JSAC*, Vol. 12, No. 5, June 1994.
- [9] E. Sourour, "Time slot assignments techniques for TDMA digital cellular systems," *IEEE Trans. Veh. Tech.* Vol. 42, No. 1, February 1994, pp. 121-127.
- [10] E. Sourour and S. C. Gupta, "Direct sequence spread spectrum parallel acquisition in nonselective and frequency selective Rician fading channels," *IEEE JSAC.*, Vol. 10, No. 3, July 1992, pp. 535-544.
- [11] E. Sourour and S. C. Gupta, "Direct sequence spread spectrum acquisition in a fading mobile channel," *IEEE Trans. Com.*, Vol. 38, No. 7, July 1990, pp. 992-998.

INTERNATIONAL CONFERENCE PUBLICATIONS

- [1] Mohamed About Hassan, Essam Sourour, Shawky Shaaban, "Novel resource allocation algorithm for improving reuse one scheme performance in LTE networks," *2014 21st International Conference on Telecommunications (ICT)*, vol. 1, pp.166 to 170, 4-7 May 2014
- [2] Mahmoud Elgenedy, Essam Sourour, Magdy Fikri, Mohammed Nafie, "Iterative MMSE-DFE equalizer for the high data rates HF waveforms in the HF channel," *Signals, Systems and Computers, 2013 Asilomar Conference on*, vol., no., pp.1243,1247, 3-6 Nov. 2013
- [3] Ahmed Wagdy, Tamer Khattab, Essam Sourour, "Modified QR-D and MMSE PMI selection technique for MIMO closed loop spatial multiplexing in LTE/LTE-advanced," *GCC Conference and Exhibition (GCC), 2013 7th IEEE*, vol., no., pp.93,97, 17-20 Nov. 2013
- [4] Mahmoud Elgenedy, Essam Sourour, Magdy Fikri, "Iterative Bi-directional Kalman-DFE equalizer for the high data rate HF waveforms in the HF channel," *Communications, Signal Processing, and their Applications (ICCSPA), 2013 1st International Conference on*, vol., no., pp.1,6, 12-14 Feb. 2013
- [5] Karim Banawan, Essam Sourour, "Turbo equalization of precoded collaborative MIMO for the uplink of LTE-advanced," *Computing, Networking and Communications (ICNC), 2013 International Conference on*, vol., no., pp.988,993, 28-31 Jan. 2013
- [6] Nancy Daa El-Din; Essam Sourour, Karim Seddik, Ibrahim Ghaleb, "Coordinated partial co-channel deployment in two-layer networks," *Computing, Networking and Communications (ICNC), 2013 International Conference on*, vol., no., pp.1162,1167, 28-31 Jan. 2013
- [7] Nancy Daa El-Din; Essam Sourour, Karim Seddik, Ibrahim Ghaleb, "A modified joint processing technique for Coordinated Multi-Point Transmission in LTE-advanced," *Wireless Information Technology and Systems (ICWITS), 2012 IEEE International Conference on*, vol., no., pp.1,4, 11-16 Nov. 2012
- [8] Karim Banawan, Essam Sourour, " Combined collaborative and precoded MIMO for uplink of the LTE-advanced," *Radio Science Conference (NRSC), 2012 29th National*, vol., no., pp.523,531, 10-12 April 2012
- [9] Mofreh El-Gendy, Essam Sourour, "A study of access methods effect on the performance of two-tier LTE femtocell networks," *Radio Science Conference (NRSC), 2011 28th National*, vol., no., pp.1,8, 26-28 April 2011
- [10] Karim Banawan, Essam Sourour, "Enhanced SIC and Initial Guess ML Receivers for Collaborative MIMO of the LTE Uplink," *Vehicular Technology Conference (VTC Fall), 2011 IEEE*, vol., no., pp.1,5, 5-8 Sept. 2011
- [11] Hany Ismail, Essam Sourour, "Downlink interference mitigation for two-tier LTE femtocell networks," *Radio Science Conference (NRSC), 2011 28th National*, vol., no., pp.1,8, 26-28 April 2011
- [12] Nancy Daa El-Din; Essam Sourour, Karim Seddik, Ibrahim Ghaleb., "Femtocells interference avoidance using Femtocell Identification," *Radio Science Conference (NRSC), 2011 28th National*, vol., no., pp.1,9, 26-28 April 2011
- [13] Hamza, A.M.; Sourour, E.; El-Khamy, S.; , "Low Complexity Novel Methods for Initial Timing Synchronization in Mobile WiMAX OFDMA System," *Vehicular Technology Conference Fall (VTC 2010-Fall), 2010 IEEE 72nd*, vol., no., pp.1-5, 6-9 Sept. 2010
- [14] Salwa Serag Eldin, Mohamed Nasr, S. Khamees, Essam Sourour, Mohamed Elbanna, "Performance enhancement of IEEE802.11n wireless LAN using irregular LDPC," *Wireless and Optical Communications Networks, 2009. WOCN '09. IFIP International Conference on*, vol., no., pp.1,5, 28-30 April 2009
- [15] Salwa Serag Eldin, Mohamed Nasr, S. Khamees, Essam Sourour, Mohamed Elbanna, "LDPC coded MIMO OFDM-based IEEE 802.11n wireless LAN," *Wireless and Optical Communications Networks, 2009. WOCN '09. IFIP International Conference on*, vol., no., pp.1,5, 28-30 April 2009
- [16] Essam Sourour, Ayman Elezabi, "Robust Acquisition of Hybrid Direct Sequence-Slow Frequency Hopping Spread-Spectrum under Multi-Tone and Gaussian Interference in Fading Channels," *Wireless Communications and Networking Conference, 2008. WCNC 2008. IEEE*, vol., no., pp.917-922, March 31 2008-April 3 2008

- [17] Islam Atef, N. Sadek, Essam Sourour, "Performance of variable multicodes and space time transmit diversity on mobile internet services using HSDPA," *Information and Communications Technology, 2007. ICT 2007. ITI 5th International Conference on*, vol., no., pp.27-32, 16-18 Dec. 2007
- [18] Amr Otefa; N. Boghdadly, Essam Sourour, "Performance analysis of 802.11n wireless LAN physical layer," *Information and Communications Technology, 2007. ICT 2007. ITI 5th International Conference on*, vol., no., pp.279-288, 16-18 Dec. 2007
- [19] Ayman Elezabi, Essam Sourour, "Performance of hybrid direct sequence-slow frequency hopping spread-spectrum acquisition under partial band interference and fading channels," *Vehicular Technology Conference, 2005. VTC-2005-Fall. 2005 IEEE 62nd*, vol.3, no., pp. 1509-1513, 25-28 Sept., 2005
- [20] Essam Sourour; H. El-Ghoroury, D. McNeill, "Frequency offset estimation and correction in the IEEE 802.11a WLAN," *Vehicular Technology Conference, 2004. VTC2004-Fall. 2004 IEEE 60th*, vol.7, no., pp. 4923-4927 Vol. 7, 26-29 Sept. 2004
- [21] Essam Sourour, "Effect of carrier separation with bandwidth limitation on the performance of multi-carrier DS-CDMA systems in multipath fading channels," Personal, Indoor, Mobile Radio Communications Conference, PIMRC 2001, Sep/Oct 2001, San Diego, California, USA, Page(s): G-17 -G-21 vol.2.
- [22] Essam Sourour, "rake receive performance for CDMA systems with quasi-orthogonal codes and forward link fast power control," VTC'2000, Spring, Tokyo, Japan, May 15-18, 2000, pp. 1470-1474, vol. 2.
- [23] Essam Sourour, Gregory Bottomley and Rajaram Ramesh, "Direct Sequence Spread Spectrum Acquisition with sample accumulation in fading channels," IEEE Veh. Tech. Conference, VTC'99 Fall, Amsterdam, The Netherlands, September 19-22, 1999, pp. 2198-2202.
- [24] Essam Sourour and Gregory Bottomley, "Effect of frequency offset on DS-SS acquisition in slowly fading channels," IEEE Wireless Communications and Networking Conference, WCNC 99, New Orleans, Louisiana, September 21-24, 1999.
- [25] Essam Sourour, Gregory Bottomley and Rajaram Ramesh, "Delay tracking for Direct Sequence Spread Spectrum systems in multipath fading channels," IEEE Veh. Tech. Conference, VTC'99 Spring, Houston, Texas, USA, May 16-19, 1999.
- [26] Said El-Khamy, Essam Sourour and Tamer Kadous, "Analysis of incoherent pre-rake TDD/DPSK/CDMA wireless portable communications," National Radio Science Conference, Feb 24-26, 1998, Helwan, Cairo, Egypt.
- [27] Gregory Bottomley, Essam Sourour and Rajaram Ramesh, "Optimizing the performance of limited complexity rake receivers," IEEE Veh. Tech. Conference, VTC'98, Ottawa, Canada, May18-21, 1998, pp. 968-972.
- [28] Essam Sourour, Gregory Bottomley and Rajaram Ramesh, "Direct Sequence Spread Spectrum Acquisition with fast search and parallel verification in a multipath fading channel," WPMC '98, Yokosuka, Japan, November 4-6, 1998, pp. 404-409.
- [29] Essam Sourour, Tamer Kadous and Said El-Khamy, "The performance of TDD/CDMA systems using pre-rake combining with different diversity techniques and imperfect channel estimation," 1997
- [30] Tamer Kadous, E. Sourour and S. El-Khamy, "Comparison between various diversity techniques of the pre-rake combining in TDD/CDMA," IEEE Veh. Tech. Conference, VTC'97, Phoenix, Arizona, USA, May 4-7, 1997 pp.2210-2214
- [31] E. Sourour and M. Nakagawa, "Mutual decentralized synchronization for inter-vehicle communications," Proceedings of the Intelligent Vehicles '96 conference, Tokyo, Japan, September 18-20, 1996, pp. 272-277.
- [32] E. Sourour, "Effect of amplifier non-linearity on the performance of the multi-carrier CDMA system," IEEE Veh. Tech. Conference, VTC'96, Atlanta, Georgia, April 28-May 1, 1996, pp. 1853-1857.
- [33] Wei Huang, Essam Sourour and M. Nakagawa, "A co-channel interference and non-linear distortion cancellation for DS/CDMA in optical link," ISSSTA' 96, Mainz, Germany, September 1996, pp. 595-599.
- [34] Essam Sourour, "The effect of cellular portable unit amplifier non-linearity on the performance of the multi-carrier CDMA system," ISSSTA' 96, Mainz, Germany, September 1996, pp. 1351-1355.
- [35] Riaz Esmailzadeh, E. Sourour and M. Nakagawa, "Pre-rake diversity combining in time division duplex CDMA mobile communications," IEEE Personal, Indoor, Mobile Communications conference, PIMRC'95, Toronto, Canada, September 27-29, 1995, pp. 431-435.
- [36] E. Sourour and M. Nakagawa, "Performance of orthogonal multi-carrier CDMA in a multipath fading channel," IEEE GLOBECOM'94, San Francisco, California, November 28 to December 2, 1994, pp. 390-394.
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- [38] E. Sourour and M. Nakagawa, "A modified multi-stage co-channel interference cancellation in asynchronous CDMA systems," IEEE Personal, Indoor, Mobile Communications conference, PIMRC'94, The Hague, The Netherlands, September 18-22, 1994, pp. 425-429.
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- [43] E. Sourour, "Capacity of TDMA digital cellular communication system," IEEE Veh. Tech. Conference, VTC '92, Denver, Colorado, 1992, pp. 1070-1073
- [44] H. Tawfik and E. Sourour, "Capacity of dual mode North American cellular system, IEEE Veh. Tech. Conference, VTC '92, Denver, Colorado, 1992, pp. 558-561.
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- [46] E. Sourour and S. C. Gupta, "Direct sequence spread spectrum parallel acquisition in nonselective Rician fading channels," Globecom '89, Dallas, Texas, Nov. 27-30, 1989, pp. 1629-1633.
- [47] E. Sourour and S. C. Gupta, "Direct sequence spread spectrum acquisition in fading mobile channels," IEEE Veh. Tech. Conference, VTC '89, San Francisco, California, 1989.
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