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## **MAHMOUD A. SMADI**

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### **EDUCATION**

**Ph.D.** Electrical Engineering, University of Texas at Arlington (UTA) GPA 4.0/4.0  
**Thesis title:** Comparative Analysis of Partially Coherent and Differentially Coherent PSK Systems with Fading and Interference  
**Major:** Wireless Communications May, 2005

**M.Sc.** Electrical Engineering, Jordan Univ. of Science and Technology (JUST) GPA 81.9/100  
**Thesis title:** Diversity Techniques for Coherent Optical Receivers  
**Major:** Communications & Electronics August, 2000

**B.Sc.** Electrical Engineering, JUST GPA 80.9/100  
**Major:** Communications & Electronics June, 1998

#### **Graduate Level Courses:**

Wireless Communications, Digital Communications, Optical Fiber Communications, Spread Spectrum Communications, Data Communications, Information Theory and Coding, Simulation of Communication Systems, Digital Signal Processing, Statistical Signal Processing, Probability and Random Signals, Antenna System Analysis, Advance Electronics, Integrated Optics, Optimal Control.

### **RESEARCH INTEREST**

Two main themes of my previous work on partially coherent wireless systems; employing diversity combining; have influenced the design of recent commercial and research systems. The first is the evaluation of the detection loss suffered and the phase precision required for the carrier recovery for different SNR reliability levels and error rate values. The second theme is to present a unified methodology to analyze the performance of both partially coherent and differentially coherent PSK systems in the presence of multipath fading and interference. My current research interest including but not limited to:

- Cellular radio communications
- Simulation of communications systems
- Interference analysis of communications systems
- Microwave propagation and transmission
- Spread spectrum communications
- Network theory

## TEACHING INTERESTS

I strive to inspire passion through teaching by connecting the material both to cutting-edge research and to the real world. While I have taught core courses in circuits analysis and engineering mathematics, below are some courses I have taught and I think they have particular impact on communication theory:

- Analog Communications
- Digital Communications and Coding
- Communication Networks
- Wireless and Personal Communications
- Information Theory
- Spread Spectrum Communications
- Digital Signal Processing
- Signals and Systems
- Probability and Random Processes

## WORK EXPERIENCES

- **Associate Professor**, Electrical Engineering (EE) Department at Hashemite University (HU) **9/2016-now**
- **Associate Professor**, EE Department at King Faisal Univ. (KFU), Saudi Arabia (ABET accredited) **9/2011-6/2016**
- **Associate Professor**, EE Department at HU **3/2011-9/2011**
- **Assistance Professor**, EE Department at HU **9/2005- 3/2011**
- **Full-time Lecturer**, EE Department at JUST **10/2000-8/2001**
- **Graduate Teaching Assistant**, EE Department at JUST **9/1998-9/2000**
- **Graduate Teaching Assistant**, EE Department at UTA **9/2002-5/2005**
- **Chairman**, EE Department at HU **9/2009-9/2010**  
**9/2016-9/2018**
- Creating a new curriculum for EE undergraduate program that takes into account the ABET requirements especially for major design, ethics and communication skills terms.
- Steering the Dept. and College efforts toward obtaining ABET accreditation (EE program at HU ABET accredited **Aug. 2018**).

## PROFESSIONAL EXPERIENCE

- Editor; the Institute of Engineering and Technology (IET) Teknologia Journal, UK.
- ABET Coordinator and steering committee chair, EE-HU 2016-now.
- Technical program committee (TPC) member; 26th International Conference on Telecommunications (ICT), Vietnam 2019.
- Chair; the Curriculum Committee, Faculty of Engineering (FoE) at Hashemite University (HU), 2018-now.
- Coordinator and Chair; the planning committee of the proposed project" The National Center for Integrated Microsystems Technology NC-IMST", Jordan 2011.

- Coordinator; the TEMPUS project granted to the Yarmouk University, 2010-2013. Project title: "An industry oriented M.Sc. Program in telecommunications engineering-towards and EU approach".
- TPC member; The IET International Conference on Intelligent Systems (ICIS), Bahrain 2008.
- TPC member; The Jordanian International Electrical and Electronics Engineering Conference (JIEEEEC), Jordan 2011.
- TPC member; Several Mosharaka International Conferences, Jordan.
- Chair session; Several IEEE and IEE International Conferences.
- Chair session; The International Conference and Exhibition on Green Energy & Sustainability (ICEGES 2009), Jordan 2009.
- Chair session; The International Conference on Computing and Information Technology (ICCIT 2012), Taibah University-KSA 2012.
- Chair; the Strategic Plan Committee in the EE Department at HU, 2008.
- Chair; the ABET Committee in the EE Department at HU, 2007.
- Chair; the Promotion and Appointment Committee in the EE Department at HU, 2009.
- Coordinator; the Undergraduate Practical Training Committee in the EE Department at HU, 2006.
- Member; The Evaluation Committee of the 3<sup>rd</sup> National Technology Parade, JUST, Jordan 2010.
- Member; Organization Committee of the 5<sup>th</sup> Engineering Scientific Day, Faculty of Engineering (FOE) at HU, 2010.
- Member; the Graduate Studies Committee, FOE at HU, 2009.
- Member; the Scientific Research Committee in the FOE at HU, 2009.
- Chair; the Curriculum Committee, EE Dept. at King Faisal University (KFU)-KSA, 2012-now.
- Chair; the Students Affairs Committee, EE Dept. at KFU-KSA, 2012-now.
- Member; the Quality Assurance Committee, FOE at KFU-KSA, 2011-now.
- Member; Searching and Hiring Committee in EE Department, FOE at KFU-KSA, 2012-now.
- FOE Representative; Student Guidance and Counseling Unit, KFU- KSA, 2011-now.
- Member; Out of College Course Coordination Committee, FOE at KFU- KSA, 2011-now.
- Member; Award for Quality Assurance and Academic Accreditation Committee, KFU-KSA, 2011-now.

### **RECENT ATTENDED ACTIVITIES**

- "Management and Implementation of Self Study Workshop", Deanship of Quality Assurance-KFU, Oct. 2011.
- "Strategic Planning and Preparation of Action Plans Workshop", Deanship of Quality Assurance- KFU, Dec. 2011.
- "International Exhibition and Conference on Higher Education", Ministry of Higher Education -Riyadh, Apr. 2012.

- "Jubail Engineering Education Conference & Exhibition", Royal Commission of Jubail - Jubail, May 2012.
- "The 2<sup>nd</sup> Saudi International Nanotechnology Conference", KACST-Riyadh, Nov. 2012.
- "Soft Skills: Methods for Teaching and Assessment Workshop", FOE-KFU, Nov. 2012.
- "Research Ability Development in Kingdom of Saudi Arabia: Formulation of the idea & Research Management Workshop", KACST-KFU, Dec. 2012.
- "ABET Accreditation Process, Standards and Criteria Workshop", FOE -KFU, Dec. 2012.
- "A Framework for Understanding Teaching Workshop ", FOE -KFU, Feb. 2013.

## REVIEW

- IEEE Transactions on Communications, USA
- IEEE Transactions on Vehicular Technology, USA
- IEEE Transactions on Wireless Communications, USA
- IEEE Transactions on Aerospace and Electronic Systems, USA
- IET Proceedings on Communications, UK
- IEEE Communications Letters, USA
- IET Electronics Letters, UK
- Elsevier -Wireless Communications and Mobile Computing, UK

## FUNDED PROJECTS

- "Implementing of GPS Spoofer using Software defined Radio Technology"; Hashemite University, Zarqa-Jordan 2018; KAFD and KADDB (5,000 \$).
- "Hashemite Radio Network (HRN)"; Hashemite University, Zarqa-Jordan 2009; KAFD and KADDB (8,000 \$).
- "Multi-input Multi-Output Technique to Mitigate the Negative Effects of Cochannel Interference in Wireless Cellular Systems"; King Faisal University, Ahsaa-KSA 2013, Deanship of scientific research (10,000 \$).
- "Enhanced Design to Measure Air Contamination in Al-Ahsa City of Eastern Region of Saudi Arabia Based on Wireless Sensor Network and Solar Cells."; King Faisal University, Ahsaa-KSA 2014, Deanship of scientific research (15,000 \$).

## PUBLICATIONS

### Journal items

1. Qasem Abu Al-Haija, Mohammad M. Asad, Ibrahim Marouf, **Mahmoud A. Smadi** "Design alternatives of Euclidian greatest common divisor with enhanced architecture" International Journal of Computer Aided Engineering and Technology- Inderscience, **in press**.

2. **M. A. Smadi**, "Tight lower bounds for MPSK Nakagami-m systems with phase error" *Int. J. Systems, Control and Communications- Inderscience*, vol. 8, pp. 125-131, **2017**.
3. **M. A. Smadi**, "A proposed combining technique for partially coherent optical signaling" *Optical Fiber Technology -Elsevier*, vol. 24, pp. 106-114, **2015**.
4. **M. A. Smadi**, "An Efficient Combining Technique to Analyze the Performance of Non-Ideal ASK Optical Systems" *Optics & Laser Technology-Elsevier*, vol. 69, pp. 187-192, **2015**.
5. A. K. S. Al-Bayati, **M. A. Smadi**, O. A. Saraereh, and A. Nimrat "Joint Carrier Frequency Offset and Channel Estimation for OFDM Systems with Two Receive Antennas," *International Journal of Communication Systems-Wiley*, DOI: 10.1002/dac, **2015**.
6. **M. A. Smadi**, Qasem Abu Al-Haija and Awni Itradat "Exact Error Rate Analysis of MIMO-MRC System under Cochannel Interference and Imperfect Channel State Information" *Wireless Personal Comm.-Springer*, vol. 79, pp. 847-859, **2014**.
7. **M. A. Smadi** and Qasem Abu Al-Haija "A Modified source coding technique for efficient data compression," *Journal of Theoretical and Applied Information Technology*, vol. 61, pp. 200-205, March **2014**.
8. Q. Abu Al-Haija, **M. Smadi**, M. Al-Ja'fari and A. Al-Shua'ibi "Efficient FPGA Implementation of RSA Coprocessor Using Scalable Modules," *Procedia Computer Science*, vol. 34, pp. 647-654, **2014**.
9. **M. A. Smadi**, S. Al-Jazzar, J. Ghaeb and O. Saraereh "Confidence Intervals Verification for Simulated Error Rate Performance of Wireless Communication System," *Wireless Personal Comm.-Springer*, vol. 71, pp. 2463-2474, **2013**.
10. Omar A. Saraereh, **M. A. Smadi**, A. K. S. Al-Bayati, Jasim A. Ghaeb and Qais Alsafasfeh, "A novel low-profile coupled-fed printed twelve-band mobile phone antenna with slotted ground plane for LTE/GSM/UMTS/WIMAX/MLAN operations," *International Journal of Electrical, Electronics Science and Engineering-WASET*, vol. 7, pp. 1063-1072, Nov. **2013**.
11. **M. A. Smadi**, S. Al-Jazzar, and J. Ghaeb, "Simplified bit error rate evaluation of Nakagami-m PSK systems with phase error recovery," *Wireless Communications and Mobile Computing -John Wiley*, vol. 12, pp. 248-256, Feb. **2012**.
12. Al-Jazzar, S.O., Al-Nimrat, A., **Mahmoud Smadi** "Delay estimation enhancement in CDMA systems using optimum training bits' power," *International Journal of Electronics and Communications (AEU)-Elsevier*, vol. 66, pp. 244-248, Jan **2012**.
13. K. Al-Bayati, S. Prakria, **M. A. Smadi**, and S. Prasad " Blind Detection of Co-channel QPSK Signals: A Phased Precoding-based Approach," *Wireless Personal Comm.-Springer*, 62(1), pp. 79-92, **2012**.
14. Ghaeb, J.A., **Smadi, M.A.**, Ababneh, M. "Progressive decrement PWM algorithm for minimum mean square error inverter output voltage," *Energy Conversion and Management- Elsevier*, 52 (11), pp. 3309-3318, **2011**.
15. S. Al-Jazzar, A. Muchkaev, A. Al-Nimrat, **M. A. Smadi**, " Low complexity and high accuracy angle of arrival estimation using eigenvalue decomposition with extension to 2D AOA and power estimation," *EURASIP Journal on Wireless Communications and Networking-Springer*, 123, pp. 1-13, **2011**.

16. S. Al-Jazzar, D.C. McLernon, J. Caffery, **M. A. Smadi**, and J. Ghaeb, "A modified unscented filter for delay tracking in asynchronous CDMA systems," *International Journal of Electronics and Communications (AEU) - Elsevier*, 65 (1), pp. 9-15, **2011**.
17. J. A. Ghaeb, **M. A. Smadi** and J. Chebil, "High Performance Data Integrity Assurance Based on Determinant Technique," *Future Generation Computer Systems- Elsevier*, 27 (5), pp. 614-619, **2011**.
18. Mohammad Ababneh, Issa Etier, **Mahmoud Smadi** and Jasim Ghaeb "Synchronization of Chaos Systems Using Fuzzy Logic," *Journal of Computer Science*, vol. 7 (2), pp. 197-205, **2011**.
19. **M. A. Smadi**, "Performance Analysis of BPSK System with Hard Decision (63, 36) BCH Code," *Journal of Theoretical and Applied Information Technology*, vol. 13, pp. 172-180, March **2010**.
20. S. Al-Jazzar, D.C. McLernon, and **M. A. Smadi**, "SVD-based joint azimuth/elevation estimation with automatic pairing," *Signal Processing- Elsevier*, vol. 90, pp. 1669-1675, May **2010**.
21. K. S. Al-Bayati and **M. A. Smadi**, "Efficient Blind Equalization of BPSK Signals," *Electronics Letters-IET*, vol. 46, pp. 658-660, April **2010**.
22. **M. A. Smadi**, V. K. Prabhu and S. O. Al-jazzar, "Analytical study on the effect of cochannel interference on partially coherent diversity systems," *IEEE Trans. Commun.*, vol. 57, pp. 117-124, Jan **2009**.
23. **M. A. Smadi**, Mohammad Ababneh and Saleh Al-Jazzar, "Simulation and Numerical Analysis of Wireless PSK Systems with Imperfect Carrier Phase Recovery," *International Journal of Modelling and Simulation-ACTA Press*, vol. 29, pp. 405-409, Dec. **2009**.
24. **M. A. Smadi**, V. K. Prabhu and A. Bayati, "Performance analysis of optimum diversity combining for partially coherent frequency-selective fading channel with intersymbol interference," *IEEE Trans. Veh. Technol.*, vol. 57, pp. 3589-3597, Nov **2008**.
25. **M. A. Smadi** and V. K. Prabhu, "Performance analysis of generalized-faded coherent PSK channels with equal-gain combining and carrier phase error," *IEEE Trans. Wireless Commun.*, vol. 5, pp. 509-513, March **2006**.
26. **M. A. Smadi** and V. K. Prabhu, "Efficient moments-based method for error rate calculations using the Beaulieu series," *IEE Proceedings on Commun.*, vol. 153, pp. 349-354, June **2006**.
27. **M. A. Smadi** and V. K. Prabhu, "Postdetection EGC diversity receivers for binary and Quaternary DPSK systems over fading channels," *IEEE Trans. Veh. Technol.*, vol. 54, pp. 1030-1036, May **2005**.
28. **M. A. Smadi** and V. K. Prabhu, "Comparative analysis of partially coherent and differentially coherent PSK systems with equal-gain diversity," *IEE Proceedings on Commun.*, vol. 152, pp. 939-944, December **2005**.

### Conference items

1. Qasem Abu Al-Haija1, Monther Al-Ja'fari1, and **Mahmoud Smadi** "A Comparative Study up to 1024 bit Euclid's GCD algorithm FPGA Implementation and Synthesizing" 5<sup>th</sup> International Conference on Electronic

- Devices, Systems and Applications (ICEDSA-2016), Ras Al Khaimah-UAE, pp. 1-4, Dec. **2016**.
2. **M. A. Smadi** and Y. H. Al-Badarneh "An enhanced combining technique of homodyne ASK optical system with laser phase noise" IEEE 28th Canadian Conference on Electrical and Computer Engineering (CCECE'15), Halifax-Canada, pp. 1398-1402, May **2015**.
  3. **M. A. Smadi** "Direct and Indirect Measures for Course Outcomes Assessment for ABET Accreditation" 2<sup>nd</sup> International Conference on Assessment (ICA'15), Riyadh-KSA, pp. 587-602, Dec. **2015**.
  4. **M. A. Smadi** and Qasem Abu Al-Haija "Precise Error Rate Analysis of MIMO System with Interference and Imperfect Channel State Information " IEEE 27th Canadian Conference on Electrical and Computer Engineering (CCECE'14), Toronto-Canada, pp. 1-5, May **2014**.
  5. Yazan H. Al-Badarneh and **M. A. Smadi** "A Unified Semi-Analytical Technique to Evaluate the Distributions of Products of Non-Identically Distributed Weibull Random Variables" IEEE Wireless Commun. and Network Conf. (WCNC'14), Istanbul-Turkey, pp. 548-553, April **2014**.
  6. **M. A. Smadi** and A. Majali "A Promising Digital-based Radio Network over IP" International Conference on Computing and Information Technology (ICCIT'12), pp. 679-683, KSA, March **2012**.
  7. Ghaeb, J.A., **Smadi, M.A.** "An optimum PWM technique to maximize the continuity of inverter output" International Conference on Energy, Environment, Devices, Systems, Communications, Computers (EEDSCC'11), Venice- Italy, pp. 54-60, March **2011**.
  8. **M. A. Smadi**, "Performance analysis of QPSK system with Nakagami fading using efficient numerical approach," IEEE 9th Malaysia International Conference on Communications (MICC'09), Kuala-Lumpur-Malaysia, pp. 447-450, Dec. **2009**.
  9. **M. A. Smadi**, "An Efficient Numerical Technique for Error Rate Analysis of Wireless Systems," IET International Conf. on Intelligent Systems (ICIS'08), Bahrain, Dec **2008**.
  10. **M. A. Smadi** and V. K. Prabhu, "Performance analysis of partially coherent BPSK in the presence of ISI," IEEE International Conference on Signal Processing and Communications (ICSPC'07), Dubai-UAE, pp. 776-779, Nov. **2007**.
  11. **M. A. Smadi** and V. K. Prabhu, "Partially Coherent BPSK in Fading Channels and Intersymbol Interference," IEEE 18<sup>th</sup> Personal, Indoor and mobile radio communications Conf. (PIMRC'07), Athens- Greece, pp. 1-5, Sep. **2007**.
  12. **M. A. Smadi**, "Performance analysis of partially coherent frequency selective channels with Doppler shift," IEEE 17<sup>th</sup> Personal, Indoor and mobile radio communications Conf. (PIMRC'06), Helsinki-Finland, pp. 1-5, Sep. **2006**.
  13. **M. A. Smadi** and V. K. Prabhu, "Partially coherent BPSK diversity receivers in cochannel interference," IEEE Global Telecomm. Conf. (GLOGECOM'05), St. Louis-MO, pp. 3398–3402, Dec. **2005**.
  14. **M. A. Smadi** and V. K. Prabhu, "Useful bounds for the BEP of partially coherent faded PSK signals," IEEE Global Telecomm. Conf. (GLOGECOM'04), Dallas-TX, pp. 2843–2847, Dec. **2004**.

15. **M. A. Smadi** and V. K. Prabhu, "Analysis of partially coherent PSK systems in wireless channels with equal-gain combining," IEEE Canadian Conf. on Elect. and Computer Engineering (CCECE'04), Ontario-Canada, pp. 99–102, May 2004.
16. **M. A. Smadi** and V. K. Prabhu, "Error rate analysis of DCPSK over generalized fading channels," IEEE Wireless Commun. and Network Conf. (WCNC'04), Atlanta-GA, pp. 65-70, March 2004.

### **THESIS COMMITTEE MEMBER**

- Bassel AL-Nabulsi, "Space-Time Coded OFDM Systems based on Low-Density Parity-Check Codes over Correlated Fading Channels," JUST, Irbid, Jordan, July 2006.
- Anas Salhab, "Co-Channel Interference in Spread Spectrum MIMO Wireless Communications Systems," JUST, Irbid, Jordan, Jan. 2007.
- Mohammad Al-Qadi, "Power Allocation Strategies in Wireless Fading Channels with Transmit Diversity," JUST, Irbid, Jordan, Jan. 2008.

### **HONORS**

- Hashemite University Ph.D. Scholarship 9/2001-9/2004
- Rudolf Hermanns Fellowship (UTA) 9/2001-9/2004
- Scholarship Office of Graduate Dean (UTA) 9/2004-5/2005
- TxTEC Scholarship (UTA) Spring 2002

### **MEMBERSHIPS**

- IEEE; Member
- Jordan Engineering Association; Member

### **SKILLS**

- **Personal:** Excellent communication, presentation, and analytical skills. Work well individually, as well as, in team oriented terms.
- **Programming and Software:** Very good in visual C++ language and Matlab. Familiar with Latex. Experience with Windows applications.

### **REFERENCES**

1. Vasant Prabhu, Professor (*PhD Supervisor*)  
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University of Texas at Arlington  
Arlington, TX 76019-0016  
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2. Amjad A. Omar, Professor  
Electrical, Electronics and Communications Engineering Department  
American University of Ras Al Khaimah, UAE  
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3. Murad Abu-Khalaf, Ph.D.  
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4. Iyad Al Falujah, Ph.D.  
Huawei Technologies, Bridgewater NJ  
E-mail: [alfalujah@ieee.org](mailto:alfalujah@ieee.org)