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Research Interests:

Optimization methods, circuit models for RF electronics and microwave components, wave propagation, antennas, wireless communications,

Academic Qualifications:

1. Ph.D., EE, University of New Mexico, 2001.

Dissertation: Analysis and Design of Broadband Antennas for the Double Quantum Well Terahertz Detector.

2. M.Sc., EE, Jordan University of Science & Technology, 1997.

Thesis: Analysis and Modeling of Shielded Coplanar Stripline (CPS) Discontinuities.

3. B.Sc., EE, Jordan University of Science & Technology, 1995.

Teaching and Research Experience:

1. 1995-1997 Teaching Assistant, Microwave Lab, Dept. of EE at JUST.
2. 1998-1999 Lab supervisor and Teaching Assistant, Princess Sumaya University of Technology, Amman, Jordan.
3. 1999-2001 Research Assistant, the Computational Electromagnetics and Antennas Lab, Department of ECE, the University of New Mexico.
4. January-August, 2002, Postdoctoral Research Scientist and Adjunct Professor, the University of New Mexico.
5. September 2002 – February 2008, Assistant Professor, Dept. of Electrical Eng., Jordan University of Science & Technology.
6. Summer 2004, Visiting Scholar, Department of ECE, University of New Mexico.
7. February 2008 – Sept. 2014, Associate Professor, Dept. of Electrical Eng., Jordan University of Science & Technology.
8. Sept. 2014-Now, Professor, Dept. of Electrical Eng., Jordan University of Science & Technology.
9. Sept. 2016-Sept. 2018, Sabbatical leave at Princess Sumaya University for Technology (PSUT).

Administrative Experience:

1. Sept. 2013- August 2015, Chairman, Dept. of Electrical Eng., Jordan University of Science and Technology.

Courses Taught:

Electromagnetics I and II, Linear Algebra, Electrical Circuits, Electronic Circuits, Antennas, Radiowave Propagation for Wireless Communications, Communications systems, RF Electronics, Microwave Electronics, Microelectromechanical (MEMS) Systems and Applications, Advanced Numerical Techniques, Evolutionary Optimization Methods, Microwave Engineering, Optical Communications.

Professional Software: Matlab, PSpice, Labview, IE3D, HFSS, and ANSOFT Designer.

Professional Membership:

- Senior Member, IEEE.
- Listed in Marquis Who's Who in Science and Engineering and Who's Who in The World.

Volunteer Work and Committees:

1. Reviewer, IEEE Transaction on Antennas and Propagations.
2. Reviewer, International Journal of Modeling and Simulation.
3. Reviewer, International Journal of RF and Microwave Computer-Aided Engineering.
4. Reviewer, Progress in Electromagnetic Research (PIER) Journal.
5. Counselor, IEEE Student Branch, Jordan University of Science & Technology.
6. Member of ABET committee inside the department of electrical engineering.
7. Member of Curriculum Development Committee inside the department of electrical engineering.
8. Chair, Session 148: Genetic Algorithm Optimization, IEEE Int. Symposium on Antennas and Propagation, Albuquerque, NM, USA, July 2006.
9. Member of the organizing committee, National Technology Parade, Amman, Jordan, May 2008.
10. Chairman of ABET Committee, EE Dept.
11. Chairman of Graduate Studies Committee, EE Dept., Sept. 2013-August 2015.
12. Representative of the EE Dept. in the Engineering College Council, 2005-2006.
13. Member of many master theses examination committees inside and outside JUST.

Supervised Graduation Projects:

1. Computer-Aided Design (CAD) of Microwave Transmission Lines, Ali Mohammad Al-Ali, May 2003.
2. Solutions of Electrostatic Problems on Computers, Reyad Al-Tarazi and Hamzah Alqudah, May 2003.
3. Microstrip Antenna Analysis and Design, Mohammad Ahmad Al-Damiri, May 2003.
4. Monofilar Axial Mode Helical Antenna: Theory, Design, Construction, and Testing, Tareq Mohammad Hayajneh and Abdullah Abo-Baker Alhaj, January 2004.
5. Demonstration of Wave Propagation Phenomena Using MATLAB GUIs, Areej Emran Al-Muqet and Basemah Daoud Al-Khatib, May 2004.
6. Fractal Antennas, Mohammad Shaker Al-Khateeb and Abdullah Ali Al-Qudah, May 2004.
7. Parabolic Reflector Antenna: Theory and Design, Hani Abbas Al-Hadedi, January 2005.
8. Rectangular to Circular Waveguide Transition, Hamzeh Al-Nimrawi, Adey Al-Alem, and Mohannad Al-Rabbaba'h, January 2005.
9. Design and Manufacturing of Electromagnetic Wave-Absorbing Materials, Laith Amawi and Fadi Awamreh, May 2005.
10. Experimental Verification of the Reflection and Refraction Laws for Plane Waves, Ahmad Jebril and Ahmad Fuad Abulwahhab, May 2005.
11. Radar Cross-Section Measurements, Fadi Abu-Dalo and Bader Alomoush, January 2006.
12. Waveguide Couplers, Nabeel Majed Atyani and Ala'a Nimer Qasem, January 2006.
13. RF Oscillator Design Using Dielectric Resonators, Majdi F. Al-Klief and Taif. N. Al-Rabadi, June 2006.
14. Induction Furnace: Operation, Design, and Implementation, Mohammad E. Kanan and Ahmad H. Mashaalah, June 2006.
15. Doppler Radar System: Design and Implementation, Yousef Al-Tamimi and Mohammad Jawdat, January 2007.
16. Corrugated Horn Antenna: Wa'ed Gharaibeh, Ula Obeidat, and Ghaida' Hazaimh, January 2008.

17. Induction Heating System, January 2012.
18. Induction Heating Cooker, January 2014.
19. RF Energy Harvesting for Low Voltage Applications, January 2015.
20. Design and Optimization of Microwave Filters Using the Cuckoo Search Algorithm, June 2017.

Supervised and Co-Supervised Master Theses:

1. **Co-Supervisor**, Full-Wave Finite-Difference Frequency- Domain Analysis of Ferrite Loaded Rectangular Waveguides, Hani Barqawi, January 2008.
2. **Supervisor**, Power Control of Wireless Networks Using the Particle Swarm Optimization Method, Gameel Saleh, July 2008.
3. **Supervisor**, Synthesis of Antenna Arrays Using the Particle Swarm Optimization Method, Mohammad Aqeel, January 2009.
4. **Supervisor**, Analysis and Design of a Reconfigurable Antenna for Wireless Communications Applications, Mohammad Jamal Irshaidat, January 2010.
5. **Supervisor**, Application of The Cuckoo Search Optimization Algorithm in Antenna Arrays, December 2014, Salah-eddin Mahasneh.
6. **Supervisor**, PERFORMANCE OPTIMIZATION OF FRACTIONAL FREQUENCY REUSE IN LONG TERM EVOLUTION (LTE) SYSTEMS USING CUCKOO SEARCH ALGORITHM, Eman Abu Shabab, June 2015.

Publications:

A) Journal Papers:

1. Y. Zebda, **M. Khodier**, and B. Darwish, "Transient Response of Optoelectronic Integrated Bistable Device," *IEEE Trans. Electron Devices*, Vol. 45, No. 1, pp. 85-90, Jan. 1998.
2. N. Dib, **M. Khodier**, and A. Omar, "Characterization of Shielded Coplanar Stripline Discontinuities by the Space Domain Integral Equation Technique," *Int. J. of Electronics*, Vol. 86, No. 12, pp. 1493-1512, 1999.
3. **M. Khodier**, C. G. Christodoulou, and J. A. Simmons, "Equivalent Circuit Model for the Double Quantum Well (DQW) THz Detector," *IEEE Trans. Electron Devices*, Vol. 49, No. 10, October 2002.
4. **M. Khodier**, C. G. Christodoulou, T. S. Liao, and P. K. L. Yu, "Antenna Integration with a Waveguide Photodetector for RF Optical Communications," *Microwave and Optical Technology Letters*, pp. 179-184, Nov. 5, 2002.
5. **M. Khodier** and C. G. Christodoulou, "A Proposed Stacked Microstrip Antenna Structure for Bandwidth Enhancement," *Microwave and Optical Technology Letters*, pp. 26-28, Jan. 5, 2003.
6. **M. Khodier** and C. G. Christodoulou, "Linear Array Geometry Synthesis with Minimum Sidelobe Level and Null Control Using Particle Swarm Optimization," *IEEE Trans. Antennas Propagat*, Volume 53, Number 8, pp. 2674-2679, August 2005.
7. J. Ababneh, **M. Khodier**, and N. Dib, "Synthesis of Interdigital Capacitors Based on Particle Swarm Optimization and Artificial Neural Networks," *International Journal of RF and Microwave Computer-Aided Engineering*, pp. 322-330, June 2006.
8. N. Dib and **M. Khodier**, "Design and Optimization of Multi-Band Wilkinson Power Divider," *International Journal of RF and Microwave Computer-Aided Engineering*, pp. 14-20, January 2008.
9. **M. Khodier**, N. Dib, and J. Ababneh, "Design of Multi-Band Transmission Line Transformer Using Particle Swarm Optimization," *Electr. Eng (2008)* 90:293-300.
10. H. Barqawi, N. Dib, and **M. Khodier**, "A Two-Dimensional Full-Wave Finite-Difference Frequency-Domain Analysis of Ferrite loaded Structures," *Journal of Infrared, Millimeter, and Terahertz Waves*, Vol. 29, No. 5, pp. 443-456, 2008.
11. M. Shihab, Y. Najjar, N. Dib and **M. Khodier**, "Design of Non-uniform Circular Antenna Arrays Using Particle Swarm Optimization," *Journal of Electrical Engineering*, Vol. 59, No. 4, pp. 216-220, 2008.

12. **M. Khodier**, "Design and Optimization of Single, Dual, and Triple Band Transmission Line Matching Transformers for Frequency-Dependent Loads," *ACES Journal*, Vol. 24, No. 5, pp. 446-452, October 2009.
13. **M. Khodier** and M. Al-aeel, "Design and Optimization of Yagi-Uda Antenna Arrays," *IET Microwaves, Antennas & Propagation*, Vol. 4, pp. 426-436, April 2010.
14. **M. Khodier** and G. Saleh, "Joint Beamforming and Power Control for Interference Reduction in Wireless Communications Using Particle Swarm Optimization," *Int. Journal of Electronics and Communications*, Vol. 64, pp. 489-502, June 2010.
15. **M. Khodier** and M. Al-aeel, "Linear and Circular Array Optimization: A Study Using Particle Swarm Intelligence," *Progress In Electromagnetics Research B*, Vol. 15, pp. 347-373, 2009.
16. **M. Khodier**, "Optimization of Antenna Arrays Using the Cuckoo Search Algorithm," *IET Microwaves, Antennas and Propagation*, Vol. 7, No. 6, 458-464, 2013.
17. **M. Khodier**, "Comprehensive study of linear antenna array optimisation using the cuckoo search algorithm," *IET Microwaves, Antennas & Propagation*, Vol. 13, No. 9, pp. 1325-1333, 2019.
18. **M. Khodier**, "Optimization of circular antenna arrays using the cuckoo search algorithm," *International Journal of RF and Microwave Computer-Aided Engineering*, pp. 1-12, April, 2020.

B) Conference Papers:

1. **M. Khodier** and C.G. Christodoulou, "A Technique to Further Increase the Bandwidth of Stacked Microstrip Antennas," *IEEE AP-S Int. Symp. Dig.*, Vol. 3, pp. 1394-1397, Salt-Lake City, UT, 2000.
2. **M. Khodier** and C. G. Christodoulou, "Optically Driven CPW-fed Slot Antenna for Wireless Communications," *IEEE AP-S Conf. on Antennas and Propagation for Wireless Communications*, pp. 121 -124, Waltham, MA, 2000.
3. **M. Khodier**, C. G. Christodoulou, and J. A. Simmons, "An Integrated Broadband Bowtie Antenna for THz detection with a Double Quantum Well," *IEEE AP-S Int. Symp. Dig.*, Vol. 1, pp. 334-337, Boston, MA, 2001.
4. **M. Khodier**, C. G. Christodoulou, and J. A. Simmons, "Terahertz Detection Using Double Quantum Well Devices," *Proc. SPIE* Vol. 4490, p. 104-113, Multifrequency Electronic/Photonic Devices and Systems for Dual-Use Applications, San Diego, CA, 2001.
5. **M. Khodier**, C. G. Christodoulou, and J. A. Simmons, "A Bowtie Antenna Coupled Tunable Photon-Assisted Tunneling Double Quantum Well (DQW) THz Detector," Invited paper, *Mat. Res. Soc. Symp. Proc.*, Vol. 692, Symp. H, Progress in Semiconductor Materials for Optoelectronic Applications, pp. H4.2.1-H4.2.13, Boston, MA, 2001.
6. **M. Khodier**, C. Christodoulou, G. Tzeremes, T. S. Liao, and P. K. L. Yu, "RF/Photonic Antenna for High Capacity Wireless Communications," *Digital Wireless Communications IV, Proceedings of SPIE*, Vol. 4740, pp. 132-141, Orlando, FL, April 1-5, 2002.
7. **M. Khodier**, C. Christodoulou, and P. K. L. Yu, "Integration of an Antenna with a Waveguide Photodetector for High Capacity Wireless Communication Systems," *IEEE AP-S Int. Symp. and USNC/URSI National Science Radio Meeting, URSI Proceedings*, p. 323, San Antonio, TX, June 2002.
8. D. Anagnostou, **M. Khodier**, J. Lyke, and C. Christodoulou, "Fractal Antenna with RF MEMS Switches for Multiple Frequency Applications," *IEEE AP-S Int. Symp. Dig.*, Vol. 2, pp. 22-25, San Antonio, TX, June 2002.
9. **M. Khodier**, G. Tzeremes, T. S. Liao, P. K. L. Yu and C. G. Christodoulou, "Smart RF/ Photonic Antennas for Ultra high capacity Wireless Communications," *Proceedings SPIE Digital Wireless Communications IV*, Vol. 4740, pp. 132-141, June 2002.
10. G. Tzeremes, **M. Khodier**, T.S. Liao, P.K.L Yu, and C.G Christodoulou, "Optically driven CPW fed slot antennas and arrays for wireless communications," *IEEE AP-S Int. Symposium on Antennas and Propagation*, Vol. 2, pp. 659 – 662, June 2003.
11. **M. Khodier**, "Radiation Characteristics of an Infinite Line Source Surrounded by Concentric Shells of Metamaterials," *IEEE AP-S Int. Symposium on Antennas and Propagation*, Vol. 3, pp. 2576 – 2579, June 2004.

12. **M. Khodier** and N. Dib, "Design of Multi-Band Transmission Line Transformer Using Particle Swarm Optimization," *IEEE AP-S Int. Symposium on Antennas and Propagation*, pp. 3305 – 3308, July 2006.
13. N. Petrella, **M. Khodier**, M. Antonini, M. Ruggieri, S. E. Barbin, and C. Christodoulou, "Planar Array Synthesis with Minimum Sidelobe Level and Null Control Using Particle Swarm Optimization," *16th International Conference on Microwaves, Radar and Wireless Communications MIKON-2006*, Krakow – Poland, pp.1087-1090, May 2006.
14. H. Barqawi, N. Dib, and **M. Khodier**, "A Full-Wave Two-Dimensional Finite- Difference Frequency-Domain Analysis of Ferrite-Loaded Structures," *Mosharaka International Conference on Communications, Propagation and Electronics (MIC-CPE 2008)*, Amman, Jordan.
15. G. Saleh and **M. Khodier**, "Radio Resource Management-Interference Reduction Using PSO," *Second Engineering Conference*, Vol. 2, Aden, Yemen, March 2009.
16. **M. Khodier** and M. Irshaidat, "Novel Multiband and Reconfigurable Antenna for Wireless Applications," *JIEEEEC 2013*, Amman, Jordan, April 2013.
17. E. S. Abushabab, **M. Khodier**, and Sh. Ismail, "Performance Optimization of Fractional Frequency Reuse in Long Term Evolution (LTE) Systems Using Cuckoo Search Algorithm," *5th International Conference on Electronic Devices, Systems and Applications (ICEDSA)*, 6-8, Dec., 2016.
18. **M. Khodier**, "Optimization of Elliptical Antenna Arrays Using the Cuckoo Search Algorithm," *2019 IEEE-APS Topical Conference on Antennas and Propagation in wireless Communications (APWC)*, Granada, Spain, pp. 143-147, 2019.

C) Books:

1. **M. Khodier**, *Broadband Antennas for the Double Quantum Well Terahertz Detector*, VDM Verlag, ISBN: 978-3-639-16707-8, 2009.

D) Workshops

1. Effect of Electromagnetic Radiation on Human Health, Jordan Engineers Association (JEA), Feb. 2017, Amman, Jordan.