CURRICULUM VITAE

Marwan M. Krunz

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Biographical Sketches

Marwan Krunz received the Ph.D. in Electrical Engineering from Michigan State University in July 1995. He joined the University of Arizona (UA) as an Assistant Professor in Jan. 1997, following a postdoctoral stint at the University of Maryland, College Park. Currently, he is a Regents Professor of Electrical & Computer Engineering, the highest academic title at the UA (limited to no more than 3% of tenured/tenure-track faculty). He also holds a joint appointment as a Professor of Computer Science at the UA and is an affiliated member of the UA Cancer Center (UACC). He is the site and deputy center director for the recently inaugurated WISPER Center, a multi-university NSF Industry/University Cooperative Research Center (I/UCRC) that focuses on secure, pervasive, and efficient Next Generation (NextG) wireless systems. Previously, Dr. Krunz was the lead director of the Broadband Wireless Access and Applications Center (BWAC), an NSF I/UCRC that was established in 2013 to address fundamental research challenges and develop efficient solutions for LTE, 5G, Wi-Fi and other wireless systems through collaborative projects involving academia, industry, and government labs. BWAC sites included UA (lead), Virginia Tech, University of Notre Dame, North Carolina State University, Auburn University, University of Mississippi, and Catholic University of America. The center was supported by many affiliate members from industry and national labs. Its themes included shared and dynamic spectrum access, millimeter-wave communications, IoT/sensor systems, wireless cybersecurity, full-duplex communications, MIMO, cognitive radar , mobile edge computing, and others. From 2008 to 2014, Dr. Krunz was the UA site director for "Connection One" (C1), another NSF I/UCRC that focused on wireless circuits and systems, with participation from five universities (UA, ASU, OSU, RPI, and Univ. of Hawaii) and 25+ members from industry and DoD labs.

M. Krunz's research is in the broad area of wireless networking and communications, with emphasis on AI and machine learning for wireless systems' adaptation, resource allocation, distributed protocol design, and PHY-layer security. Recently, he has been involved in projects related to waveform/protocol classification and adaptation using novel deep neural networks and reinforcement learning, LTE/5G cellular coverage, Wi-Fi security, mmWave systems (beam discovery, initial access, phased antenna arrays, wireless backhauling, etc.), agile radios, dynamic and shared spectrum access, harmonious coexistence of passive and active wireless systems, full-duplex transmissions, ultra-low-latency mobile edge computing (MEC) for V2X, network slicing, physical-layer design, satellite communications, MIMO systems, energy management in wireless sensor networks, and streaming over wireless links. In the past, he worked on traffic analysis, packet scheduling, multimedia communications, power control, constraint-based routing, fault detection in optical networks, and others. He coauthored more than 345 published/accepted journal articles and peer-reviewed conference papers. He is a co-inventor of 11 issued patents as well as several pending patent applications and invention disclosures. His latest h-index is 64 and his total number of citations exceeds 15,500. His research has been funded by NSF, DOD (ARO, AFRL, AFOSR), NASA, Qatar Foundation, South Korea, and several US and international corporations – with a total amount in excess of $22M. His grants include 27 competitive NSF awards, 19 of which he served as the sole or lead PI.

M. Krunz received numerous awards and recognitions. He previously held the Kenneth VonBehren Endowed Professorship in ECE (2015–2022). He is an IEEE Fellow (class of 2010), Arizona Engineering Faculty Fellow (2011-2014), and IEEE Communications Society Distinguished Lecturer (2013 and 2014). He is a recipient of the Outstanding Service Award of IEEE Communications Society's Technical Committee on Communications "in recognition of consistent high-quality service to TCCC, including leadership in organization of top conferences and sustained editorial service for journals that are central to TCCC" (one award was given in 2012). In 2010, he received the prestigious Visiting Chair of Excellence ("Catedra de Excelencia") from the University of Carlos III de Madrid, Spain, following a worldwide selection process that culminated in one US awardee and four awardees from the rest of the world in all academic fields. In 2011, he was awarded a Fulbright Senior Specialist, allowing him to visit with King Abdullah II School of

Information Technology at the University of Jordan. Dr. Krunz was a recipient of the NSF CAREER award (1998-2002). He received the best-paper award of the ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWim'18) and the 2007 International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CrownCom'07). He was also a runner-up for the best-paper award of several other conferences. He was invited as a researcher/distinguished faculty on short-term visits (1–6 months) by numerous universities and research labs, including University Technology Sydney, Australia (2016–2018), University of Paris V (2013), INRIA-Sophia Antipolis, France (2011, 2008, and 2003), University of Paris VI (2006), HP Labs, Palo Alto (2003), US West Advanced Technologies (1997), and others. In 1994 and during his Ph.D. studies, M. Krunz received the International Thoman Fellowship Award from Michigan State University.

From 2017 to 2020, Dr. Krunz served as the Editor-in-Chief for the IEEE Transactions on Mobile Computing, one of the premier journals in the field of wireless and mobile networking, overseeing a board of 70+ associate editors. He previously served on the editorial boards of several international journals, including IEEE Transactions on Cognitive Communications and Networking (2015-2018), IEEE Transactions on Network and Service Management (2010-2014), IEEE Transactions on Mobile Computing (2006-2011), IEEE/ACM Transactions on Networking (2001-2008), International Journal of Distributed Sensor Networks (2013-2014), and Computer Communications Journal (2001-2011). He was a guest co-editor for special issues in IEEE magazines. Dr. Krunz chaired numerous top-tier international conferences in the field of mobile networking and communications. He served as a general co-chair for the 2023 International Symposium on Modeling and Optimization in Mobile, Ad hoc, and Wireless Networks (WiOpt) and the 2012 ACM Conference on Wireless Network Security (WiSec'12). He also served as the general vice-chair for the WiOpt 2016 Conference. He chaired the technical program committee (TPC) of Hot Interconnects Symposium 2001, INFOCOM 2004, SECON 2005, WoWMoM 2006, and WCNC 16 (Networking Track). He was an Area TPC chair for INFOCOM'10 and INFOCOM'11. He served and continues to serve on the steering committees of several conferences, journals, and strategic research forums, including the Research Coordination Network on mmW research (mmW-RCN). Funded by NSF, mmW-RCN aims at accelerating cross-disciplinary mmW research by providing a global platform for collaboration between academia, industry, and government agencies involved in this critical area, with emphasis on prototype development, standardization, and product rollouts. Dr. Krunz hosted and co-organized the 3rd mmW-RCN workshop in Tucson, AZ (Jan. 2018).

Dr. Krunz was the keynote speaker at numerous conferences and workshops, including SECON'24, ICNC'24, ICCSPA'22, ICNC'20, ISCIT'17, UNET'15, ICCSP'15, CRESS 2014 (1st IEEE International Workshop on Cognitive Radio and Electromagnetic Spectrum Security), CCW 2012, IFIP Wireless Days 2011, and WiMesh 2009. He served on the 2015 IEEE Fellows Evaluation Committee (Computer Society). He was a panelist and panel moderator at various international conferences, including ICCSPA'24, WCNC 2016, INFOCOM 2009, and SECON 2009. He served as a proposal reviewer and panelist for several funding agencies (NSF, ARO, AAAS, Science Foundation Ireland, etc.), and was invited to speak and organize panels on funding priorities at workshops run by these agencies. He gave tutorials at premier wireless networking conferences such as MobiCom and MobiHoc. Under his directorship, 32 Ph.D. dissertations and M.S. theses were completed. He mentored 7 postdoctoral researchers and several junior and mid-career faculty members. Dr. Krunz is also an entrepreneur, and has been involved in three startup companies. He frequently consults for companies in telecommunications and the wireless industry.

1 Education

- **Ph.D. in Electrical Engineering (09/92 – 07/95)**
  Michigan State University, East Lansing, Michigan
- **M.S. in Electrical Engineering (01/91 – 07/92)**
  Michigan State University, East Lansing, Michigan
- **B.S. in Electrical Engineering (09/85 – 06/90)**
  University of Jordan, Amman, Jordan

2 Professional Experience

2.1 Academic Employment History

Current Appointments:

- **Regents Professor**, Dept. of Electrical & Computer Engineering, University of Arizona (2021 – present)
- **Professor** (joint appointment), Dept. of Computer Science, University of Arizona (2009 – present)
- **Professor** (honorary appointment), School of Electrical and Data Engineering, University Technology Sydney, Australia (2017 – present)
- **Site Director and Deputy Center Director**, NSF WISPER Center (2024 – present)
- **Member**, University of Arizona Cancer Center (2022 – present)

Previous Appointments:

- **Professor**, Department of Electrical & Computer Engineering, University of Arizona (2006 – 2021)
- **Kenneth VonBehren Endowed Professor**, Dept. of Electrical & Computer Engineering, University of Arizona (2015 – 2023)
- **Center and Site Director**, NSF Broadband Wireless Access Center (2018 – 2024)
- **Center and Site Co-director**, NSF Broadband Wireless Access Center (July 2013 – Aug. 2018)
- **Site Director**, NSF Connection One Center, University of Arizona (Feb. 2008 – June 2014)
- **Associate Professor**, Department of Electrical & Computer Engineering, University of Arizona (Jan. 2002 – June 2006)
- **Assistant Professor** Department of Electrical & Computer Engineering, University of Arizona (1997 – 2002)
- **Postdoctoral Research Associate**, Department of Computer Science and Institute for Advanced Computer Studies (UMIACS), University of Maryland, College Park (Sep. 1995 – Dec. 1996)
- **Graduate Research Assistant**, Michigan State University, East Lansing, Michigan (1991 – 1995)

2.2 Invited Visiting Positions

- **Visiting Professor** (October 2016)
  School of Electrical and Data Engineering, University Technology Sydney
  Sydney, Australia
- **Visiting Professor** (Summer 2013)
  University of Paris Descartes (Paris 5), LIPADE Group
  Paris, France
- **Visiting Professor** (July & Aug. 2011)
  King Abdullah II School of Information Technology, University of Jordan
  Amman, Jordan
- **Invited Research Professor** (June 2011)
  Planète group, French National Institute for Research in Computer Science and Control (INRIA)
  Sophia Antipolis, France
- **Visiting Chair of Excellence** (March 2010 – August 2010)
  University of Carlos III de Madrid and IMDEA Networks Research Institute
  Madrid, Spain
- **Invited Research Professor** (July 2008)
  MAESTRO group, French National Institute for Research in Computer Science and Control (INRIA)
  Sophia Antipolis, France
- **Invited Professor** (May/June 2006)
  Laboratoire d'Informatique de Paris 6, University Pierre et Marie Curie (Paris VI)
  Paris, France
- **Invited Visiting Researcher** (Nov. 2003)
  Mobile & Multimedia Streaming Group, HP Labs
  Palo Alto, California
- **Invited Research Professor** (April 2003–Aug. 2003)
  MISTRAL Group, French National Institute for Research in Computer Science and Control (INRIA)
  Sophia Antipolis, France
- **Visiting Scientist** (July 98–Aug. 98)
  Advanced Technologies, US West (now a part of CenturyLink)
  Boulder, Colorado

3 Honors, Recognition, and Awards

- Kenneth VonBehren Endowed Professor, University of Arizona (August 2015 – August 2023).
- Distinguished Alumni Award, Department of Computer Science and Engineering, Michigan State University (2020).
- IEEE Fellow (2010).
- Fellow, Asia-Pacific Artificial Intelligence Association (2021).

- IEEE Communications Society Distinguished Lecturer (2013 and 2014).
- IEEE Communications Society Technical Committee on Communications Outstanding Service Award (one award given in 2012).
- Arizona Engineering Faculty Fellow (2011–2014)
- Chair of Excellence ("Catedra de Excelencia"), University of Carlos III de Madrid (2011 one US awardee selected in that year).
- Editor-in-Chief, IEEE Transactions on Mobile Computing (2017 – 2020).
- Fulbright Senior Specialist Award (2011).
- Best-paper award, *ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWim'18)*, for the paper "FastLink: An efficient initial access protocol for millimeter wave systems," (coauthored with Irmak Aykin), Oct. 2018.
- Best student-paper award, *International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CrownCom 2007)*, for the paper "Price-based spectrum management in cognitive radio networks," (coauthored with Fan Wang and Shuguang Cui), Aug. 2007.
- NSF CAREER award, 1998.
- Mentor, Outstanding Graduate Student Award (Mohammad J. Abdel-Rahman, Ph.D. in ECE, 2014, University of Arizona).
- Coauthored paper "Exploiting frame preamble waveforms to support new physical-layer functions in OFDM-based 802.11 systems," was selected by the IEEE COMSOC as a Tech Focus paper on prototyping wireless networks, 2018.
- Runner-up for the best-paper award of the *IEEE MILCOM 2023 Conference* (paper title: "Detection and classification of smart jamming in Wi-Fi networks using machine learning," coauthored with Zhengguang Zhang).
- Runner-up for the best-paper award of the *WiOpt 2014 Symposium* (4 finalists selected from 167 submissions, paper title: "On the throughput of full-duplex MIMO in the multi-link case," coauthored with Diep Nguyen and Stephen Hanly).
- Runner-up for for best-paper award, IEEE 2005 Technical Committee on Multimedia Communication (paper title: "A playback-adaptive approach for video streaming over wireless networks," co-authored with M. Hassan, *Proc. of the IEEE GLOBECOM 2005 Conference - Wireless Communication Symposium*).
- International Thoman Fellowship Award for Outstanding Doctoral Candidates, 1994.
- ASAI Scholarship, ASAI Association (1992–1995).
- Michigan State University Summer Graduate Fellowship, 1995.

4 Research Interests

- Wireless networking with emphasis on protocol design and resource allocation in 4G/5G cellular systems, Wi-Fi, WLANs, IoT and sensor networks.
- mmWave communications, with emphasis on phased antenna arrays, analog/digital beamforming, massive MIMO, initial access and discovery, tracking, channel characterization, and wireless backhaul.
- AI and machine learning for wireless systems (signal classification, detection of rogue transmissions, protocol adaptation, GANs, reinforcement learning for network control, etc.).
- Wireless security, with emphasis on PHY-layer security, selective and insider attacks, fingerprint-free communications, transmission obfuscation, adaptive frequency hopping, etc.
- MIMO systems, including applications security and multi-link communications.
- Dynamic and shared spectrum access over licensed and unlicensed.
- In-band full-duplex communications.
- Ultra-low-latency mobile edge computing, network slicing, and applications in connected and autonomous vehicles.
- Energy management and coordination mechanisms (coverage, sleep-mode scheduling, localization, etc.) for wireless sensor networks.
- Space and satellite communications, with emphasis on proactive sensing for interference mitigation, dynamic frequency hopping, network discovery under jamming, and drone communications.

[Previous interests/projects include, among others, media streaming, teletraffic analysis, packet scheduling, constraint-based routing, failure detection in all-optical networks]

5 Research Grants and Contracts

PI or Co-PI on tens of federal, industry, and foreign-government grants/contracts, totaling > $22M; personally responsible for ∼ $12M of this amount. Grants include 27 highly competitive NSF awards (sole or lead PI for 19 of these). A subset of these grants/contracts is listed below in reverse chronologically order:

- "FuSe2 Topic 1: Energy-efficient, Near-Memory CMOS+X Architecture for Hardware Acceleration of DNNs with Application to NextG Wireless Systems," National Science Foundation, Oct. 1, 2024 – Sep. 30, 2027 (in collaboration with Arizona State University as the lead institution and Case Western Reserve University; total award $1.9M; UA portion: $575K, PI on the UA award).
- "IUCRC Phase I University of Arizona: Center for Wireless Innovation towards Secure, Pervasive, Efficient, and Resilient Next G Networks (WISPER)," National Science Foundation, Oct. 1, 2024 – Sep. 30, 2029 (in collaboration with Virginia Tech and George Mason University; UA award: $750K, PI on the UA proposal with Dr. Michael Wu as co-PI).
- "Scalable and Reliable Edge-assisted Cooperative Perception for Safety-critical CAV Applications," TRIF Funding Program, the University of Arizona, July 1, 2024 – June 30, 2025 ($90K without indirect cost, co-PI, in collaboration with Ming Li).
- "Generative AI Techniques for Synthesis and Pairing of Single-cell Multi-spectral Images and Gene Expression Profiles in Cancer Research," TRIF Funding Program, the University of Arizona, July 1, 2024 – June 30, 2025 ($168,982 without indirect cost, PI, in collaboration with Curtis Thorne).
- "Sci-Vision, a Single-Cell Organoid Technology for Interrogating Tumor Heterogeneity and Therapy-Resistant Cell Lineages," CCSG NIH/NCI grant award P30CA023074 (through the University of Arizona Cancer Center), July 1, 2023 – June 30, 2024 (co-PI, in collaboration with Curtis Thorne, College of Medicine, Univ. of Arizona; total amount: $100K).
- "A Smart Self-driving Vehicle for Secure and Reliable Next-Generation Intelligent Transportation Systems," TRIF/Innovative Tech for 4th Industrial Revolution (IT4IR) Initiative, State of Arizona, Sep. 2022 – Dec. 2023 (co-PI, in collaboration with Larry Head and Loukas Lazos; total amount: $250K).
- "Collaborative Research: SWIFT: Coexistence and Interference Mitigation in the Mid-Band Spectrum: Analysis, Protocol Design, and Experimentation," National Science Foundation, Oct. 1, 2022 – Sep. 30, 2025 (lead PI, in collaboration with Univ. of Notre Dame, total: $750K, my portion: $375K).
- "Exploring Coexistence and Spectrum Sharing between Commercial Wireless Systems and Passive Radio Astronomy Receivers," National Science Foundation (Supplement Grant); Aug. 2021 – Sep. 2023 (PI, $110,000).
- "Machine-learning Based Sensing and Waveform Adaptation for SDRs Operating in Congested and Contested Environments," Phase-II STTR, Army Research Office (through Space Micro Inc. as prime); Dec. 1, 2020 – May 31, 2022; total amount $1.1M; UA portion $330,000.
- "SII Planning: Interdisciplinary and Cross-Layer Research Agenda for the National Wireless Spectrum Center," National Science Foundation, Aug. 15, 2020 – July 31, 2021 (in collaboration with Rutgers University, Columbia University, and New York University; total amount $300K; UA portion $50K, co-PI).

- "Machine-Learning Based Sensing and Waveform Adaptation for SDRs Operating in Congested and Contested Environments," Phase-I STTR, Army Research Office (through Space Micro Inc. as prime); March 1, 2020 – June 1, 2020 ; total amount $176K; my portion $86K.
- "CNS Core: Small: Collaborative Research: A Stochastic Resource Allocation and Task Assignment Framework for Mobile Edge Computing," National Science Foundation, Oct. 1, 2019 – Sep. 30, 2022 (in collaboration with Catholic University of America; total amount $500K; UA portion $250K, PI).
- "Design of Adaptive Preambles for Wi-Fi Systems," Electronic Design and Development Inc., 2019 – 2020 (university gift; $38,500, PI).
- "Sensing and Signal Classification Using Deep Learning," L3-Harris, 2019 (university gift; $20K, PI, in collaboration with Tamal Bose).
- "Secure Cloud Storage Verification Methods," National Science Foundation, Aug. 2018 – July 2021 ($500K, co-PI, in collaboration with Loukas Lazos and Bane Vasic).
- "Phase II IUCRC University of Arizona: Broadband Wireless Access and Applications Center (BWAC)," National Science Foundation, Oct. 2018 – Sep. 2023 ($555,550, PI and center director, in collaboration with Tamal Bose).
- "BWAC Supplement," National Science Foundation (subcontract through Catholic Univ. of America), Oct. 2018 – Sep. 2023 ($50K, PI).
- "BWAC Supplement," National Science Foundation (subcontract through Virginia Tech.), Oct. 2018 – Sep. 2023 ($50K, PI).
- "BWAC Supplement," National Science Foundation (subcontract through Univ. of Mississippi), Oct. 2018 – Sep. 2023 ($50K, PI).
- "BWAC Supplement," National Science Foundation (subcontract through North Carolina State Univ.), Oct. 2019 – Sep. 2023 ($40K, PI).
- "Secure and Fair Spectrum Sharing for Heterogeneous Coexistent Systems," National Science Foundation, Oct. 2017 – Sep. 2020 ($600K, co-PI, in collaboration with Loukas Lazos and Ming Li).
- Raytheon Corporation – multiple projects through BWAC membership, July 2013 – Aug. 2019 ($260K, PI, in collaboration with Tamal Bose).
- Keysight Technologies – multiple projects through BWAC membership, July 2013 – Aug. 2019 ($350K, PI, in collaboration with Tamal Bose).
- Denso Corporation – two projects through BWAC membership, August 2017 – Aug. 2019 ($90K, PI, in collaboration with Tamal Bose).
- General Dynamics – two projects through BWAC membership, August 2017 – present ($100K, PI, in collaboration with Tamal Bose).
- Futurewei – one project through BWAC membership, July 2017 – June 2018 ($40K, co-PI, in collaboration with Ivan Djordevic and Tamal Bose).
- "I/UCRC for Broadband Wireless Access and Applications Center Site at the Catholic University of America," National Science Foundation – subcontract through CUA, Aug. 2016 – July 2018 ($120K, co-PI, in collaboration with Tamal Bose).

- "NeTS: Medium: Collaborative Research: Coexistence of Heterogeneous Wireless Access Technologies in the 5 GHz Bands," National Science Foundation, Aug. 1, 2016 – July 31, 2020 (in collaboration with Virginia Tech and Temple University; total amount $1,174,990; UA portion $450K, PI for the UA award).
- EpiSys Science Inc. – multiple projects through BWAC membership, July 2013– Aug. 2017 ($126,100, co-PI, in collaboration with Tamal Bose).
- "Dynamic Frequency Hopping Satellite Networks," NASA Phase-I STTR, 2015 – 2016 (in collaboration with Space Micro; total amount $125K; UA portion $60K, PI).
- "Security Beyond Encryption: Physical-layer Techniques for Obfuscating Communication Fingerprints," Qatar National Research Fund, Feb. 2016 – June 2019 (in collaboration with Ali Ghrayeb, Texas A&M University Qatar; total amount $693,247; UA portion $277,561, PI).
- "NeTS: Medium: Reconfigurable Antennas and Optimized Multi-channel MIMO Designs for DSA Systems with a Broad Frequency Coverage," National Science Foundation, Sep. 2015–Aug. 2019 ($800K, PI, in collaboration with Hao Xin).
- Space Micro – a project through BWAC membership (entitled "Game-theoretic Frequency/Waveform Adaption in Satellite Systems"), Aug. 2013 – July 2014 ($40K, PI).
- "I/UCRC FRP: Exploiting Self-interference Suppression and Full-duplex Capabilities in Opportunistic Wireless Systems," National Science Foundation, Sep. 2015–Aug. 2017 ($200K, PI, in collaboration with Tamal Bose).
- "I/UCRC: Collaborative Research: Broadband Wireless Access & Applications Center," National Science Foundation, Sep. 2013 – August 2018 ($686,821, co-PI and site co-director, in collaboration with Tamal Bose and Haris Volos).
- "TWC: Medium: Leakage of Communications Signatures: Analysis of Eavesdropping Attacks and Proactive Countermeasures," National Science Foundation, Oct. 2014–Sep. 2018 ($660K, PI, in collaboration with L. Lazos).
- Rincon Research Corporation – three projects through BWAC membership, July 2013–Aug. 2016 ($120K, co-PI, in collaboration with Tamal Bose).
- "FRP: Collaborative Research: Coexistence of Heterogeneous Secondary Networks for Shared Spectrum Access," National Science Foundation, August 2014 – July 2016 ($200K, PI, in collaboration with Virginia Tech.).
- "COHERENT: COgnitive HEterogenous wiREless Network Testbed," (DURIP Grant), AFOSR, Sep. 2013 – Sep. 2014 ($320K, PI, in collaboration with T. Bose, H. Volos, and H. Xin).
- "Blinding Eve: Methods for Concealing Wireless Communications in Mobile Coalitions," Army Research Office (ARO), Aug. 2013 – July 2016 ($460K, PI, in collaboration with Loukas Lazos).
- "Optimal Sensing, Resource Allocation, and Protocol Design for Real-time Communications in Dynamic Spectrum Access Networks," Qatar National Research Fund, Jan. 2013 – Sep. 2015 (in collaboration with Qatar University, Qatar, and Nile University, Egypt; total award $1,035,000; UA portion $201,400; lead PI).

- "Rendezvous Protocols and Dynamic Frequency Hopping Designs for Anti-Jamming Satellite Communications," Air Force Research Lab., May 2012–June 2013 ($50K, PI, in collaboration with Ricardo Sanfelice).
- "Collaborative Research: Cognitive MIMO Communications for Dynamic-spectrum Wireless Networks," National Science Foundation, Aug. 2012–July 2014 ($200K, PI, in collaboration with Sayfe Kiaei, ASU).
- "TC: Small: Enemies from Within: Thwarting Sophisticated Insider Attacks in Wireless Networks," National Science Foundation, July 2010–July 2013 ($499,535, co-PI, in collaboration with Loukas Lazos).
- "NeTS: Medium: Collaborative Research: Exploiting Battery-Supply Nonlinearities in Optimal Resource Management and Protocol Design for Wireless Sensor Networks," National Science Foundation, Sep. 2009–Aug. 2012 (in collaboration with Sarma Vrudhula, ASU; total amount $550K; UA portion $340,000; PI).
- "Incorporating STAR Capabilities in the Design of Channel Access Protocols," Raytheon Corporation – project through the Connection One Center, July 2012–June 2013 ($50K, PI).
- "Interference and Jamming Mitigation in Satellite Communications Using Spectrum Sensing and Dynamic Frequency Hopping," AFRL, April 2011–Dec. 2011 ($50K, PI).
- "Cognitive Radio Spectrum Management and Waveform Adaptation for High-Capacity Satellite Communications," Phase-I Air Force STTR, June 2012–Feb 2013 (total amount $100K, in collaboration with Space Micro).
- "Protocols for Virtual MIMO in Multi-hop Wireless Sensor Networks," Raytheon Corporation – project through the Connection One Center, July 2011–June 2012 ($50K, PI).
- "Modeling and Prediction of Battery Lifetime in Wireless Sensor Nodes," Raytheon Corporation, Sep. 2010–July 2011 ($50K, PI).
- Analog Devices Inc. – three projects through the Connection One Center, July 2008–June 2011 ($150K, PI).
- Hydronalix – two projects through the Connection One Center, July 2011–June 2013 ($100K, PI, in collaboration with Ricardo Sanfelice).
- "Securing Control Communications in Spectrum-Agile Wireless Networks," Raytheon Corporation – a project through the Connection One Center, July 2010–June 2011 ($50K, PI).
- "Radio Frequency Characterization of Composites and Meta-materials for Novel 3D Circuit Applications" National Science Foundation, ($200K, PI, in collaboration with Kathie Melde from the UA and John Volakis from Ohio State Univ.; UA portion $100K).
- "Efficient Mechanisms for Sequential Channel Sensing/Probing in Practical CR Systems under Sensing Inaccuracies," Raytheon Corporation – a project through Connection One Center, Sep. 2009–July 2010 ($50K, PI).
- "Design of a Transport Layer for Reliable Delivery in Multi-hop RAFAR Networks," Raytheon Corporation, Sep. 2009–Aug. 2010 ($80K, PI).

- "Connection One: Telecommunication Circuits and Systems (I/UCRC)," National Science Foundation, July 2008–June 2014 ($150K, PI).
- "NeTS-WN: Cross-layer Optimizations and Adaptive Protocols For Opportunistic and Collaborative Cognitive Radio Networks," National Science Foundation, Sep. 2007–Aug. 2010 ($345,394 PI, in collaboration with Shuguang Cui).
- Texas Instruments (TI) - two projects through the Connection Once Center, Aug. 2008 – July 2010 ($100K, PI).
- "Interference-aware Routing and Flow-based Reservation for Multi-hop Cognitive Radio Networks," Raytheon Corporation – a project through the Connection One Center, Sep. 2008–Aug. 2009 ($50K, PI).
- "Securing Opportunistic Spectrum Access in Cognitive Radio Networks," BAE Systems – a project through the Connection One Center, Sep. 2008–Aug. 2009 ($50K, PI, in collaboration with Loukas Lazos).
- "Cross-layer Routing and Channel Access Mechanisms for Multi-hop Wireless RAFAR Networks in Mobile Scenarios," Raytheon Corporation, Sep. 2007–July 2008 ($80K, PI).
- "Forward Error Correction Codes and Protocols for Next Generation Optical Networks," National Science Foundation - ITR/Group, Sep. 2003–Aug. 2008 ($2.5K, co-PI, in collaboration with B. Vasic, R. Kostuk, S. Ramasubramanian, and D. Geraghty).
- "NeTS-ProWin: Resource Management and Distributed Protocols for Heterogeneous Cognitive Radio Networks," National Science Foundation, Sep. 2006–Oct. 2007 ($125K, PI, in collaboration with Shuguang Cui).
- "Dynamic Spectrum Adaptation in Wireless Packet Networks" – Raytheon Corporation – project through the Connection One Center, Aug. 2006–Sep. 2007 ($60K, PI, in collaboration with Shuguang Cui).
- "Design and Evaluation of Transmission Power Control for Raytheon Advance Frequency Agile Radio (RAFAR) Networks," Raytheon Corporation, Sep. 2006–Aug. 2007 ($40K, PI).
- "Stateless Quality of Service Routing in IP Networks," National Science Foundation - ITR, Sep. 2003–Aug. 2007 ($350K, PI).
- "U.S.-Jordan Cooperative Research: Integrated Design of Channel Codes and Bandwidth Management Schemes for Optical Networks," National Science Foundation, August 2004–July 2007 ($19,400, PI).
- "A Control Theoretic Approach to The Design of Internet Traffic Managers," National Science Foundation - Special Projects in Networking Research, Sep. 2001–Aug. 2005 (in collaboration with Ibrahim Matta and Azer Bestavros, Boston University; total amount $1,037,000; UA portion $337,000; PI for UA award).
- "Integrated Design of Next Generation Broadband Mobile Networks: Antennas, Codes, and Protocols," National Science Foundation – Wireless Communications Initiative, Oct. 1999–Sep. 2003 ($450K, co-PI, in collaboration with B. Ryan, M. Marcellin, and K. Virga).

- "Query Time Estimation and Adaptive Throughput Performance Improvement," Raytheon Corporation, 2004/2005 ($150K, PI).
- "CAREER: Traffic Characterization and Resource Allocation for Transporting Video Streams Over Broadband Networks," National Science Foundation, March 1998–Aug. 2002 ($205K, PI).
- "Adaptive Encapsulation of IP Traffic Within Ethernet Frames Subject to Delay Guarantees," Raytheon Corporation, 2002 ($69K, PI).
- "Adaptive Ethernet Improved Bandwidth and QoS Technology Demonstrator," Raytheon Corporation, 2003 ($65K, PI).
- UA/ASU Center for Low Power Electronics, 2001–2005 ($120K, PI).
- "Video Transmission Over Wireless Networks," UA/ASU Grant Collaboration, funded through Proposition 301, 2002 (UA portion $16,000, PI).
- "A framework for Statistical Performance Guarantees in Heterogeneous Networks," Faculty Grant Award, Office of the VP for Research, University of Arizona, 1997/1998 ($4,500, PI).

6 Publications

Articles (accepted or published only)

1. Bui Minh Tuan, Van-Dinh Nguyen, Nguyen Van Huynh, Diep N. Nguyen, Dinh Thai Hoang, Marwan Krunz, Nguyen Linh Trung, and Eryk Dutkiewicz, "Securing MIMO Wiretap Channel with Learning-Based Friendly Jamming under Imperfect CSI," accepted for the *IEEE Internet of Things Journal*, Jan. 2025.
2. Huixiang Zhu, Yong Xiao, Yingyu Li, Guangming Shi, and Marwan Krunz, "SANSee: A physical-layer semantic-aware networking framework for distributed wireless sensing," accepted for the *IEEE Transactions on Mobile Computing (TMC)*, Oct. 2024.
3. Zhiwu Guo, Chicheng Zhang, Ming Li, and Marwan Krunz, "Fair probabilistic multi-armed bandit with applications to network optimization," accepted for the *IEEE Transactions on Machine Learning in Communications and Networking (TMLCN)*, June 2024.
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Note: Acceptance Rate (**AR**) is provided when known

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2. Md Rabiul Hossein and Marwan Krunz, "PCI classification in 5G NR: Deep learning unravels synchronization signal blocks," *Proc. of the IEEE SECON 2024 Conference*, Dec. 2024.

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71. Diep Nguyen and Marwan Krunz, "Be responsible: A novel communications scheme for full-duplex MIMO radios," *Proc. of the IEEE INFOCOM 2015 Conference*, Hong Kong, April 2015 (acceptance rate 19%).

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84. Wessam Afifi and Marwan Krunz, "Exploiting self-interference suppression for improved spectrum awareness/efficiency in cognitive radio systems," *Proceedings of the IEEE INFOCOM 2013 Conference*, Turin, Italy, April 2013.

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91. Tao Shu and Marwan Krunz, "Detection of malicious packet dropping in wireless ad hoc networks based on privacy-preserving public auditing," *Proc. of the ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec 2012)*, pp. 87-98, Tucson, Arizona, April 2012.

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93. Diep N. Nguyen and Marwan Krunz, "Spectrum management and power allocation in MIMO cognitive networks," *Proc. of the IEEE INFOCOM 2012 Conference*, pp. 2023-2031, Orlando, Florida, March 2012 (acceptance rate 18%).

94. Junseok Kim and Marwan Krunz, "Spectrum-aware beaconless geographical routing protocol for mobile cognitive radio networks," *Proc. of the IEEE GLOBECOM 2011 Conference – Wireless Networking Symposium*, Dec. 2011.

95. Haythem Bany Salameh, Marwan Krunz, and David Manzi, "An efficient guard-band-aware multichannel spectrum sharing mechanism for dynamic access networks," *Proc. of the IEEE GLOBECOM 2011 Conference – Ad-hoc and Sensor Networking Symposium*, Dec. 2011.

96. Diep Nguyen and Marwan Krunz, "A cooperative clustering protocol for energy constrained networks," *Proc. of the IEEE SECON 2011 Conference*, Salt Lake City, Utah, June 27-30, 2011.

97. Sisi Liu, Loukas Lazos, and Marwan Krunz, "Thwarting inside jamming attacks on wireless broadcast communications," *Proc. of the ACM Conference on Wireless Network Security (WiSec'11)*, Hamburg, Germany, June 15-17, 2011 (full paper; acceptance rate $\sim$ 10%).

98. Haythem Bany Salameh and Marwan Krunz, "Channel assignment and access protocols for spectrum-agile networks with single-transceiver radio," *Proc. of the IFIP/TC6 Networking 2011 Conference*, Valencia, Spain, pp. 178–197, May 2011.

99. Raed Al-Zubi, Marwan Krunz, and Leo Lopes, "Resource utilization mechanism for multi-rate ultra-wide band networks," *Proc. of the IEEE GLOBECOM 2010 Conference – Wireless Networking Symposium*, Dec. 2010.

100. Tao Shu and Marwan Krunz, "Exploiting microscopic spectrum opportunities in cognitive radio networks," *Proc. of the IEEE SECON 2010 Conference*, Boston, June 2010 (acceptance rate 23%).

101. Raed Al-Zubi and Marwan Krunz, "Overhearing-aware joint routing and rate selection in multi-hop multi-rate UWB-based WPANs," *Proc. of the IEEE INFOCOM 2010 Conference*, San Diego, March 2010 (acceptance rate 17.5%).

102. Tao Shu and Marwan Krunz, "Truthful least-priced-path routing in opportunistic spectrum access networks," *Proc. of the IEEE INFOCOM 2010 Conference*, San Diego, March 2010 (acceptance rate 17.5%).

103. Raed Al-Zubi, Mohammad Z. Siam, and Marwan Krunz, "Coexistence problem in IEEE 802.22 wireless regional area networks," *Proc. of the IEEE GLOBECOM 2009 Conference – Wireless Networking Symposium*, Hawaii, Dec. 2009.

104. Tao Shu and Marwan Krunz, "Throughput-efficient sequential channel sensing and probing in cognitive radio networks under sensing errors," *Proc. of the ACM MobiCom 2009 Conference*, Beijing, China, Sep. 2009 (acceptance rate 10.6%).

105. Loukas Lazos, Sisi Liu, and Marwan Krunz, "Spectrum opportunity-based control channel assignment in cognitive radio networks," *Proc. of the IEEE SECON 2009 Conference*, Rome, Italy, June 2009 (acceptance rate 18.8%).

106. Fan Wang and Marwan Krunz, "Multi-channel spectrum-agile MAC protocol with adaptive load control," *Proc. of the IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM 2009)*, Greece, June 2009.

107. Haythem Bany Salameh, Marwan Krunz, and Ossama Younis, "Dynamic spectrum access protocol without power mask constraints," *Proc. of the IEEE INFOCOM 2009 Conference*, Rio de Janeiro, Brazil, April 2009 (acceptance rate 20%).

108. Mohammad Siam, Marwan Krunz, and Ossama Younis, "Energy-efficient clustering/routing for cooperative MIMO operation in sensor networks," *Proc. of the IEEE INFOCOM 2009 Conference*, Rio de Janeiro, Brazil, April 2009 (acceptance rate 20%).

109. Tao Shu and Marwan Krunz, "Coordinated channel access in cognitive radio networks: A multi-level spectrum opportunity perspective," *Proc. of the IEEE INFOCOM 2009 Mini-Conference*, Rio de Janeiro, Brazil, April 2009.

110. Tao Shu, Sisi Liu, and Marwan Krunz, "Secure data collection in wireless sensor networks using randomized dispersive routes," *Proc. of the IEEE INFOCOM 2009 Mini-Conference*, Rio de Janeiro, Brazil, April 2009.

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116. Fan Wang, Marwan Krunz, and Shuguang Cui, "Spectrum sharing in cognitive radio networks," *Proc. of the IEEE INFOCOM 2008 Mini-Conference*, Phoenix, April 2008.

117. Satyajeet Ahuja and Marwan Krunz, "Server placement in multiple-description-based media streaming," *Proc. of the Data Compression Conference (DCC)*, pp. 372–381, Salt Lake, Utah, March 25–27, 2008.

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121. Ossama Younis, Marwan Krunz, and Srinivasan Ramasubramanian, "A framework for resilient online coverage in sensor networks," *Proceedings of the IEEE SECON 2007 Conference,* San Diego, June 18–21, 2007 (acceptance rate $\approx$ 20%).

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125. Alaa Muqattash and Marwan Krunz, "Performance of wireless CDMA networks under optimal link-layer adaptation," *Proceedings of the IEEE INFOCOM 2007 Conference*, Anchorage, Alaska, May 6–12, 2007.

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127. Tao Shu, Haythem Bany-Salameh, and Marwan Krunz, "Cross-layer optimization of a CSMA protocol with adaptive modulation for improved energy efficiency in wireless sensor networks," *Proceedings of the IEEE GLOBECOM 2006 Conference*, San Francisco, Dec. 2006.

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130. Jesus Arango and Marwan Krunz, "Improving throughput in 802.11 networks using adaptive IP encapsulation," *Proceedings of the IEEE GLOBECOM 2006 Conference*, San Francisco, Dec. 2006.

131. Satya Ahuja and Marwan Krunz, "Algorithms for server placement in multiple-description-based media streaming," *Proceedings of the IEEE GLOBECOM 2006 Conference*, San Francisco, Dec. 2006.

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135. Fan Wang, Ossama Younis, and Marwan Krunz, "Throughput-oriented MAC for mobile ad hoc networks with variable packet sizes," *Proceedings of the IEEE SECON 2006 Conference*, Reston, Virginia, Sep. 25–28, 2006.

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137. Srinivasan Ramasubramanian, Mithun Harkara, and Marwan Krunz, "Distributed linear time construction of colored trees for disjoint multipath routing," *Proceedings of the IFIP Networking 2006 Conference*, Coimbra, Portugal, May 15–19, 2006.

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139. Alaa Muqattash, Marwan Krunz, and Tao Shu, "On the performance of joint rate/power control with adaptive modulation in wireless CDMA networks," *Proceedings of the IEEE INFOCOM 2006 Conference*, Barcelona, Spain, April 2006.

140. Fan Wang, Ossama Younis, and Marwan Krunz, "GMAC: A game-theoretic MAC protocol for mobile ad hoc networks," *Proceedings of WiOpt'06 (4th Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks)*, Boston, April 3–7, 2006.

141. Mohamed Hassan, Satyajeet Ahuja, and Marwan Krunz, "Efficient video broadcast over wireless channels using adaptive playback," *Proceedings of the Data Compression Conference (DCC)*, Salt Lake, Utah, March 28 – 30, 2006 (poster presentation).

142. Mohamed Hassan and Marwan Krunz, "A playback-adaptive approach for video streaming over wireless networks," *Proceedings of the IEEE GLOBECOM 2005 Conference – Wireless Communications*, St. Louis, Missouri, Nov. 28 – Dec. 2, 2005.

143. Satyajeet S. Ahuja, Marwan Krunz, and Turgay Korkmaz, "Optimal path selection for Ethernet over SONET under inaccurate link-state information," *Proceedings of the IEEE BROADNETS 2005 – Broadband Optical Networking Symposium*, Boston, October 3-7, 2005.

144. Tao Shu and Marwan Krunz, "Joint power/rate optimization for CDMA-based wireless sensor networks," *Proceedings of SenMetrics 2005 – Third International Workshop on Measurement, Modelling, and Performance Analysis of Wireless Sensor Networks*, San Diego, July 2005.

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146. Tao Shu, Marwan Krunz, and Sarma Vrudhula, "Power balanced coverage time optimization for clustered wireless sensor networks," in *Proceedings of the ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc 2005)*, May 2005, Urbana-Champaign, IL (acceptance rate: 14%).

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148. Abdullah Balamash and Marwan Krunz, "A client side WWW prefetching model," in *Proceedings of the IEEE GLOBECOM Conference*, Dallas, Nov.-Dec. 2004.

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151. Marwan Krunz and Phillip Rosengard, "Adaptive IP encapsulation for real-time traffic over Ethernet," in *Proceedings of the International Conference on Computer Communications and Networks (ICCCN'04)*, Chicago, Oct. 2004.

152. Satyajeet S. Ahuja, Turgay Korkmaz, and Marwan Krunz, "Minimizing the differential delay for virtually concatenated Ethernet over SONET systems," in *Proceedings of the International Conference on Computer Communications and Networks (ICCCN'04)*, Chicago, Oct. 2004.

153. Mohamed Hassan, Luigi Atzori, and Marwan Krunz, "Video transport over wireless channels: A cycle-based approach for rate control," in *Proceedings of the ACM Multimedia 2004 Conference*, pp. 916–923, New York, Oct. 2004.

154. Alaa Muqattash and Marwan Krunz, "A single-channel solution for transmission power control in wireless ad hoc networks," in *Proceedings of the ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc 2004)*, May 2004, Tokyo, Japan.

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156. Abdullah Balamash and Marwan Krunz, "Accurate characterization of WWW traffic," in *Proceedings of the IEEE ICC 2004 Conference*, June 2004, Paris, France.

157. Mohammad Manshaei, Thierry Turletti, and Marwan Krunz, "A media-oriented transmission mode selection in 802.11 wireless LANs," in *Proceedings of the IEEE Wireless Communications and Networking Conference*, March 2004, Atlanta.

158. Marwan Krunz and Mohamed Hassan, "Adaptive rate control scheme for video streaming over wireless channels," in *Proceedings of the Data Compression Conference (DCC)*, pp. 242–251, March 2004, Utah.

159. Aytac Azgin and Marwan Krunz, "Scheduling in wireless cellular networks under probabilistic channel information," in *Proceedings of the International Conference on Computer Communications and Networks (IC3N)*, Oct. 2003, Dallas, Texas.

160. Aytac Azgin and Marwan Krunz, "Impact of channel modeling on the performance of wireless scheduling schemes," in *Proceedings of the Vehicular Technology Conference (VTC)*, Orlando, Florida, Oct. 2003.

161. Alaa Muqattash and Marwan Krunz, "CDMA-based MAC protocol for wireless ad hoc networks," in *Proceedings of the ACM MobiHoc 2003 Conference*, June 2003, Annapolis, Maryland.

162. Alaa Muqattash and Marwan Krunz, "Power controlled dual channel (PCDC) medium access protocol for wireless ad hoc networks," in *Proceedings of the IEEE INFOCOM 2003 Conference*, April 2003, San Francisco.

163. Turgay Korkmaz and Marwan Krunz, "Hybrid flooding and tree-based broadcasting for reliable and efficient link-state dissemination," in *Proceedings of the IEEE GLOBECOM 2002 Conference – High-Speed Networks Symposium*, Nov. 2002, Taiwan.

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171. Turgay Korkmaz and Marwan Krunz, "Multi-constrained optimal path selection," in *Proceedings of the IEEE INFOCOM 2001 Conference*, pp. 834 – 843, Anchorage, Alaska, April 2001.

172. Marwan Krunz, "On the limitations of the variance-time test for inference of long-range dependence," in *Proceedings of the IEEE INFOCOM 2001 Conference*, pp. 1254 – 1260, Anchorage, Alaska, April 2001.

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176. Jeong Geun Kim and Marwan Krunz, "Delay analysis for QoS support in wireless networks," in *Proceedings of the 7th International Conference on Network Protocols (ICNP '99)*, pp. 254 – 261, Nov. 1999.

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179. Marwan Krunz, "The correlation structure for a class of scene-based video models," in *Proceedings of the International Packet Video Workshop (PV' 99)*, April 1999 (New York).

180. Jeong Geun Kim and Marwan Krunz, "Quality of service over wireless ATM links," in the *Proceedings of the IEEE INFOCOM '99 Conference*, pp. 1003–1010, Vol. 3, March 21–25, New York, 1999.

181. Marios G. Scottis, Marwan Krunz, and Max M.-K Liu, "Enhancing the PCI bus to support real-time streams," in *Proceedings of the 18th IEEE International Performance, Computing, and Communications Conference (IPCCC '99)*, pp. 303 – 309, Feb. 1999, Phoenix.

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194. Marwan Krunz, Herman Hughes, and Parviz Yegani, "Design and analysis of a buffer management scheme for multimedia traffic with loss and delay priorities," *Proceedings of the IEEE GLOBECOM '94 Conference*, pp. 1560–1564, San Francisco, November 1994.

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Book Chapters

1. Alaa Muqattash, Marwan Krunz, and Sung-Ju Lee, "A Perspective on the design of power control for mobile ad hoc networks," in *Mobile Wireless and Sensor Networks: Technology, Applications and Future Directions*, pp. 73–104, Editors R. Shorey, C. M. Choon, O. W. Tsang, and A. Ananda, John Wiley & Sons, Inc., 2006.

2. P. Van Mieghem, F. A. Kuipers, T. Korkmaz, M. Krunz, M. Curado, E. Monteiro, X. Masip-Bruin, J. Sole-Pareta, and S. Sanchez-Lopez, "Quality of service routing," COST 263 Book, Chapter 2, pp. 80 – 117, editors M. Smirnov et al. (published by Springer Verlag).

3. Marwan Krunz, "Statistical multiplexing," *Encyclopedia of Electrical and Electronics Engineering*, Vol. 20, pp. 479 – 492, Ed. John Webster, John Wiley & Sons, Inc., April 1999.

7 Poster Presentations (representative samples)

- Mohammad Hossein Manshaei, Julia Morris, Pearl Wichaidit, Darren Cusanovich, Curtis Thorne, and Marwan Krunz, "SciVision: A novel approach to uniting genotypic, transcriptomic, and phenotypic profiling at single cell resolution," Cancer Engineering Symposium, University of Arizona, March 2023.

- Sopan Sarkar, Mohammad Hossein Manshaei, and Marwan Krunz, "Synthesizing RF cover maps using generative adversarial networks," NSF BWAC Meeting, Washington DC, March 2023.

- Irmak Aykin, Berk Akgun, and Marwan Krunz, "Multi-lobe beam searching for initial access in mmWave systems," NSF RCN Meeting, Univ. of Arizona, Jan. 2018.

- Hanif Rahbari, Jerry Park, and Marwan Krunz, "Designing frame preambles for initializing security functions," NSF BWAC Meeting, Univ. of Notre Dame, Oct. 2017.

- Irmak Aykin and Marwan Krunz, "Directional network discovery in mmW systems," NSF RCN Meeting, Univ. of Wisconsin, Madison, July 2017.
- Irmak Aykin and Marwan Krunz, "Efficient beam finding and tracking in mmW systems," NSF BWAC Meeting, Virginia Tech., May 2017.
- Yong Xiao and Marwan Krunz, "Inter-operator carrier aggregation for next-generation wireless networks," NSF BWAC Meeting, November 2016.
- Wessan Afifi and Marwan Krunz, "Enabling media streaming over LTE-U small cells," NSF BWAC Meeting, Tucson, March 2016 (**received best-poster award**).
- Mohammed Hirzallah, Wessam Afifi, and Marwan Krunz, "Spectrum sensing and interference mitigation for LTE/WiFi coexistence," NSF BWAC Meeting, Tucson, March 2016.
- Berk Akgun, O. Ozan Koyluoglu, and Marwan Krunz, "Exploiting full-duplex receivers for achieving secret communications in multiuser MIMO systems," NSF BWAC Meeting, Tucson, March 2016.
- Irmak Aykin, Mohammad Abdel-Rahman, and Marwan Krunz "Proactive sensing and interference mitigation for satellite communications using dynamic frequency hopping," NSF BWAC Meeting, Univ. of Mississippi, Oxford, Nov. 2015 (**received best-poster award**).
- Wessam Afifi and Marwan Krunz, "Opportunistic spectrum access systems with self-interference suppression capabilities," NSF BWAC Meeting, Univ. of Notre Dame, April 2015.
- Hanif Rahbari and Marwan Krunz, "Leakage of communications signatures: Analysis of eavesdropping attacks and proactive countermeasures," NSF SaTC PI Meeting, Washington DC, Jan. 2015.
- Hanif Rahbari and Marwan Krunz, "Energy-efficient jamming attacks on channel and frequency offset estimation in wireless systems," NSF BWAC Meeting, Blacksburg, VA, May 2014.
- Manjesh Hanawal and Marwan Krunz, "Game theoretic frequency/waveform adaptation in satellite systems," NSF BWAC Meeting, Auburn, AL, Oct. 2013.
- Mohammad J. Abdel Rahman and Marwan Krunz, "Rendezvous under smart jamming," NSF BWAC Meeting, Auburn, AL, Oct. 2013.
- Mohammad J. Abdel Rahman, Hanif Rahbari, and Marwan Krunz, "Anti-jamming frequency hopping techniques for secure multicast communications," NSF BWAC Meeting, Tucson, AZ, April 2013.
- Marwan Krunz and Wessam Afifi, "Exploiting self-interference suppression in the design of wireless networks," NSF BWAC Meeting, Tucson, AZ, April 2013 (received best student-poster award).
- Mohammad J. Abdel Rahman, Marwan Krunz, and Diep Nguyen, "Frequency and waveform adaptation strategies for countering smart adversaries in satellite systems," NSF BWAC Meeting, Tucson, AZ, April 2013.
- Junseok Kim and Marwan Krunz, "Incorporating simultaneous transmit/receive capabilities in the design of channel access protocols," NSF Connection One Semi-annual Meeting, Tucson, Jan. 2013.
- Marwan Krunz, Ricardo Sanfelice, Mohammad J. Abdel Rahman, and Diep Nguyen, "Game theoretic channel selection and waveform adaptation for anti-jamming satellite systems," NSF Connection One Semi-annual Meeting, Tucson, Jan. 17-18, 2013.

- Mohammad J. Abdel Rahman, Hanif Rahbari, and Marwan Krunz, "Anti-jamming frequency hopping techniques for secure multicast communications," Connection One Semi-annual Meeting, Tucson, Jan. 17-18, 2013.
- Marwan Krunz and Ricardo Sanfelice, "Adaptive frequency hopping and synchronization-based algorithms for rendezvous," *AFRL Cognitive RF Workshop*, Albuquerque, Sep. 2012.
- Mohammad J. Abdel Rahman and Marwan Krunz, "Anti-jamming frequency hopping techniques for secure multicast communications," *ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec 2012)*, Tucson, Arizona, April 16-18, 2012.
- Marwan Krunz, "Securing control communications in spectrum-agile wireless networks," *2nd Annual AFRL Workshop on Cognitive and Software-Defined RF Technology*, WP Air Force Base, Dayton, Ohio, Sep. 2011.

8 Patents and Invention Disclosures

1. Christopher K. Walker, Juan Carlos Lopez-Tonazzi, Brandon J. Swift, and Marwan M. Krunz, "Dielectric antenna array and system," U.S. Patent No. 11,715,874 B2, issued Aug. 1, 2023 (filed April 12, 2021 as Appl. no. 17/228,453; continuation of Appl. no. 16/818,504, now Pat. no. 10,998,625).
2. Marwan Krunz and Hanif Rahbari, "Method for exploiting preamble waveforms to support device and network functionalities in wireless systems," U.S. Patent No. 11,038,730, issued June 15, 2021 (PCT patent application no. 16/486,635, filed Feb. 16, 2018; claims the benefits of U.S. Provisional Patent Application No. 62/459,886, entitled "A method for exploiting preamble waveforms to support new physical-layer functionalities in wireless systems.")
3. Christopher K. Walker, Juan Carlos Lopez-Tonazzi, Brandon J. Swift, and Marwan M. Krunz, "Dielectric antenna array and system," U.S. Patent No. 10,998,625, issued May 4, 2021 (filed March 13, 2020; application no. 16/818,504; based on U.S. Provisional Patent Application No. 62/671,408, filed on May 14, 2018; U.S. Provisional Patent Application No. 62/693,584, filed on Jul. 3, 2018; and U.S. Provisional Patent Application No. 62/754,952, filed on Nov. 2, 2018).
4. Marwan Krunz, Irmak Aykin, and Berk Akgun, "A method for fast beam sweeping and device discovery in 5G millimeter wave and upper centimeter-wave systems," U.S. Patent No. 10,972,172, issued April 6, 2021 (PCT Patent Application no 16/593,867, filed Oct. 5, 2019. Previously, a provisional version of this patent was filed on Oct. 5, 2018 based on Invention Disclosure UA 18-209). Licensed to Freefall Aerospace Inc. on Sep. 13, 2019.
5. Sergio E. Cardona, Kevin W. Patrick, Joel Blumke, Silvio Cardero, Kevin G. Ehrichs, Samuel F. Frey, Thomas G. Subiti, Marwan M. Krunz, and Milton E. Cardona, "3D 360 degree omnidirectional MIMO," U.S. Patent No. 10,784,591, issued Sep. 22, 2020 (filed March 25, 2020; application no. 16/830,065).
6. Marwan Krunz and Wissam Afifi, "Method for improving spectrum sensing and efficiency in cognitive wireless systems," U.S. Patent No. 10,645,589, issued May 5, 2020 (filed Oct. 30, 2017 under application no. 15/797,306; continuation of application no. PCT US14/033479, filed April 9, 2014; provisional application no. 61/812,595 filed on Apr. 16, 2013).
7. Marwan Krunz, Berk Akgun, Peyman Siyari, Hanif Rahbari, Rashad Eletreby, and Onur Ozan Koyluoglu, "Systems and methods for securing wireless communications," U.S. Patent No. 10,439,755,

issued Oct. 8, 2019 (Application no. 16/012,620, filed June 19, 2018; division of application no. 15/336,070, filed Oct. 27, 2016; based on U.S. provisional patent application 62/246,862, filed Oct. 27, 2015).

8. Marwan Krunz, Berk Akgun, Peyman Siyari, Hanif Rahbari, Rashad Eletreby, and Onur Ozan Koyluoglu, "Systems and methods for securing wireless communications," U.S. Patent No. 10,069,592, issued Sep. 4, 2018. (Application no. 15/336,070, filed Oct. 27, 2016; based on U.S. provisional patent application 62/246,862, filed Oct. 27, 2015).

9. Marwan Krunz, Wessam Afifi, and Mohammed Hirzallah, "A method for adapting the clear channel assessment threshold to support Wi-Fi/LTE-U coexistence," Invention Disclosure UA16-228, filed June 21, 2016.

10. Antony A. Franklin, Myung Su Song, Jin Suk Pak, Marwan Krunz, and Tao Shu, "Channel allocation method in multi-channel cognitive radio network," U.S. Patent Application No. 13/314,792, filed Feb. 2012.

11. Phillip Rosengard and Marwan Krunz, "Method and system for encapsulating variable-size packets," US Patent No. 7,376,141, issued May 20, 2008.

12. Phillip Rosengard and Marwan Krunz, "Encapsulating packets into a frame for a network," US Patent No. 7,324,522, issued Jan. 29, 2008.

13. Phillip Rosengard and Marwan Krunz, "Method and system for encapsulating cells," US Patent No. 7,013,318, issued March 14, 2006.

9 Keynotes, Panels, and Invited Talks

I. Keynote and Plenary Speaker

- 21st Annual IEEE International Conference on Sensing, Communication, and Networking (SECON'24), Phoenix, Arizona, Dec. 2024 (keynote speaker; presentation title: "Application of Generative AI for Coverage and Capacity Planning in Next-generation Wireless Systems").
- International Conference on Computing, Networking and Communications (ICNC 2024), Big Island, HI, Feb. 2024 (conference plenary speaker; presentation title: "Synthesizing RF Coverage Maps For Wireless Systems Using Generative AI").
- International Conference on Communications, Signal Processing, and their Applications (ICCSPA'22), Cairo, Egypt, Dec. 2022 (keynote speaker; presentation title: "Machine Learning for Signal and Protocol Classification over Shared Spectrum").
- International Conference on Computing, Networking and Communications (ICNC 2020), Big Island, HI, Feb. 2020 (conference plenary speaker; presentation title: "Machine Learning Techniques for Fast Protocol Adaptation in Wireless Networks Systems").
- 17th International Symposium on Communications and Information Technologies (ISCIT 2017), Cairns, Australia, Sep. 2017.
- International Symposium on Ubiquitous Networking (UNet 2015), Casablanca, Morocco, Sep. 2015.
- International Conference on Communications, Signal Processing, and their Applications (ICCSPA'15), Sharjah, United Arab Emirates, Feb. 2015.

- First IEEE International Workshop on Cognitive Radio and Electromagnetic Spectrum Security (CRESS 2014), San Francisco, Oct. 2014.
- IEEE Computer Communications Workshop (CCW), Sedona, Nov. 2012.
- IFIP Wireless Days 2011 Conference, Niagara Falls, Canada, Oct. 2011.
- IEEE Workshop on Wireless Mesh Networks (WiMesh 2009), Rome, June 2009.

II. Invited Speaker at Conferences/Workshops

- International Conference on Computing, Networking and Communications (ICNC 2023), Honolulu, HI, Feb. 2023 (invited talk). Presentation title: "Stealthy Adversarial Machine Learning Attacks on RF Signal Classifiers: Algorithms and Countermeasures").
- Community Open Meeting for the NSF National Radio Dynamic Zones program (NRDZCOM1), virtual meeting organized by NSF, Dec. 2022 (invited speaker). Presentation title: "Coexistence and Interference Mitigation in the Mid-Band Spectrum: Analysis, Protocol Design, and Experimentation".
- Army Research Office (ARO) Workshop on Network Security, Philadelphia, PA, Nov. 2022 (invitation-only workshop; presentation title: "Adversarial Machine Learning Attacks on Signal Classifiers").
- International Conference on Computing, Networking and Communications (ICNC 2019), Honolulu, HI, Feb. 2019 (invited talk). Presentation title: "Network Discovery and Tracking in Directional Millimeter-Wave 5G Systems").
- International Conference on Computing, Networking and Communications (ICNC 2018), Maui, HI, March 2018 (invited distinguished lecturer). Presentation title: "Obfuscation of Transmission Fingerprints for Secure Wireless Communications").
- International Symposium on Ubiquitous Networking (UNet 2015), Casablanca, Morocco, Sep. 2015.
- AFRL Cognitive RF Workshop, Albuquerque, Sep. 2012.
- Third International Workshop on Measurement, Modeling, and Performance Analysis of Wireless Sensor Networks (SenMetrics 2005), San Diego, July 2005. Presentation title: "Joint power/rate optimization for CDMA-based wireless sensor networks."
- IEEE Workshop on High Performance Switching and Routing (HPSR 2004), April 2004. Presentation title: "Power control protocol for mobile ad hoc networks."
- Workshop on MOBile, WIreless and SEnsoR Networks: Technology and Future Directions (MOBWISER), March 2004, Singapore. Presentation title: "Power controlled MAC protocols for mobile ad hoc networks."
- 16th IEEE Computer Communications Workshop (CCW), Charlottesville, Virginia, Oct. 14–17, 2001. Presentation title: "Computation of QoS routes in the presence of state inaccuracies."

III. Invited Talks at Universities and Industry/Government Labs (partial list)

- Concordia Institute for Information Systems Engineering, Montreal, Canada, July 2023
  Title: Adversarial Machine Learning Attacks on RF Signal Classifiers
- University of Sydney, Sydney, Australia, Oct. 2022
  Title: Stealthy Adversarial Machine Learning Attacks on RF Signal Classifiers: Algorithms and Countermeasures
- Huazhong University of Science and Technology (HUST), Wuhan, China, Oct. 2018
  Title: Harmonious Coexistence of Heterogeneous Systems in Horizontal Spectrum Sharing Settings
- L3 Technologies (L3T) – Communications Systems West, Salt Lake City, UT, Oct. 2017
  Title: Secure Wireless Communications and Networking
- INRIA – Paris, France, July 2017
  Title: Harmonious Coexistence Between Wi-Fi and LTE Systems in the 5 GHz Bands: Challenges and Solutions
- University Technology Sydney, Australia, School of Computing and Communications, March 2017
  Title: Exploitation of Full-duplex Communications in Opportunistic Access Systems
- Iowa State University, ECE Department, Ames, Nov. 2016
  Title: Obfuscation of Transmission Fingerprints for Secure Wireless Communications
- University Technology Sydney, Australia, School of Computing and Communications, Oct. 2016
  Title: Obfuscation of Transmission Fingerprints for Secure Wireless Communications
- University of California at San Diego (UCSD), CSE Department, May 2016.
- Huawei Technologies – France Research Center, Paris, France, July 2015.
- University of British Columbia, Vancouver, Canada, Nov. 2013 (IEEE Distinguished Lecture).
- University of Utah, Salt Lake City, Nov. 2013 (IEEE Distinguished Lecture).
- IEEE-Oregon Local Chapter, Portland, Nov. 2013 (IEEE Distinguished Lecture).
- IEEE-Washington Local Chapter, Seattle, Nov. 2013 (IEEE Distinguished Lecture).
- University of Jordan and Princess Sumaya University for Technology (sponsored by the IEEE Jordan section and the IEEE Communications Society Jordan Chapter), Amman, Jordan, July 2013.
- University of Paris Descartes (Paris 5), LIPADE Group Paris, France, June 2013.
- Qatar Texas A&M University, Doha, Qatar, May 2013.
- Computer Science Department, University of California, Davis, Nov. 2011.
- King Abdullah II School of Information Technology, the University of Jordan, Amman, Jordan, July 2011.
- Department of Telecommunications Engineering, Hijjawi Faculty for Engineering Technology, Yarmouk University, Jordan, June 2011.

- INRIA Sophia Antipolis (Planète team), France, June 2011.
- Air Force Research Lab – Kirtland, May 2010.
- Institute IMDEA Networks (Madrid Institute for Advanced Studies), April 2010.
- Boeing, Networked Systems Technology (November 2009, Invited Speaker).
- Department of Electronic Engineering, Tsinghua University, China (Sep. 2009, Distinguished Speaker).
- Electronics and Telecommunications Research Institute (ETRI), Daejeon, South Korea (Feb. 2009, Invited Speaker).
- Montana State University, Bozeman (Oct. 2008, Distinguished Speaker).
- INRIA, Sophia Antipolis (July 2008).

IV. Invited Panelist and Panel Organizer/Moderator at Conferences/Workshops

- International Conference on Communications, Signal Processing, and their Applications (ICCSPA'24), Istanbul, Turkey, July 2024 (panel organizer & moderator; panel title "Role of AI and Machine Learning in Advanced Wireless Systems").
- Army Research Office (ARO) Workshop on Dynamic and Proactive Defense in Networked Systems, Tampa, FL, Dec. 2017 (invitation-only workshop; invited panelist; panel title "Vision: Creating proactive and adaptive techniques and methodology in networked systems").
- 1st NSF Research Coordination Network (RCN) Workshop on Millimeter-wave Systems (mmW-RCN), Washington DC, Dec. 2016 (invited panelist; panel title: "Cross-disciplinary collaboration in mmW research - scoping the landscape and charting a course for RCN contributions").
- IEEE WCNC 2016 Conference, Doha, Qatar, April 2016 (panel organizer & moderator; panel title "Global research funding opportunities: models & lessons learned"; panelists include program managers from ONR-Global, NSF, Qatar Foundation, and IIT-Kanpur).
- IEEE SECON 2009 Conference, Rome, Italy, June 2009 (panelist; panel title "Cognitive radio networks: Possible paths from research to real world").
- IEEE INFOCOM 2009 Conference, Rio de Janeiro, Brazil, April 2009 (panel organizer, moderator, and panelist; panel title "Current trends in wireless networks.")

V. Conference Tutorials

- "Power efficient protocols for mobile ad hoc networks," *ACM MobiHoc 2004 Conference*, May 2004 (half-day).
- "Power efficient protocols for wireless ad hoc networks," *ACM MobiCom 2004 Conference*, Sep. 2004 (full-day).

10 Professional Service

- **Editorial Board**
  - Editor-in-Chief, *IEEE Transactions on Mobile Computing (TMC)*, 2017–2020.
  - Associate Editor, *IEEE Transactions on Cognitive Communications and Networking*, 2015–2018.
  - Associate Editor, *IEEE Transactions on Network and Service Management*, 2010–2014.
  - Editor, *International Journal of Distributed Sensor Networks*, 2013–2014.
  - Member of the International Advisory Committee (IAC), *the Jordanian Journal of Computers and Information Technology (JJCIT)*, 2015–present.
  - Associate Editor, *IEEE/ACM Transactions on Networking*, 2001–2008.
  - Associate Editor, *IEEE Transactions on Mobile Computing*, 2006–2011.
  - Editor, *Computer Communications Journal*, 2001–2011.
  - Technical Editor, *IEEE Communications Interactive Magazine*, 1998–2003.
  - Guest Editor (with Ibrahim Matta), *IEEE Communications Magazine, Feature Topic on Quality of Service Routing*, June 2002.
  - Guest Editor (with John Lockwood), *IEEE Micro, Special Issue on Hot Interconnects*, Jan./Feb. 2002.
- **General Chair, Technical Program Chair, and Steering Committees**
  - General Co-Chair, 21st International Symposium on Modeling and Optimization in Mobile, Ad hoc, and Wireless Networks (WiOpt'23), Singapore, Aug. 2023.
  - TPC Co-Chair, 2nd Workshop on Next-Generation Intelligent and Resilient Mobile Networking and Computing (NGMobile 2022), Bologna, Italy July 2022 (collocated with the IEEE ICDCS 2022 Conf.).
  - TPC Co-Chair, The First Workshop on Next-Generation Mobile Networking and Computing, Washington DC, July 2021 (collocated with IEEE ICDCS).
  - Program Co-organizer (with Ted Rappaport), Expert Meeting on Spectrum Sharing and Coexistence between Terrestrial Wireless Systems and Passive Ground- and Satellite-based Receivers, Oct. 28, 2020.
  - Steering Committee Member (Networking thrust), NSF Research Coordination Network (RCN) on mmWave Wireless Research, June 2016 – present.
  - Program Co-organizer and Local Host, 3rd NSF Research Coordination Network (RCN) Workshop on Millimeter-Wave Technologies, Tucson, Jan. 2018.
  - Vice General Chair, WiOpt 2016 Conference, Sedona, Arizona, April 2016.
  - TPC Chair of Networking Track, IEEE WCNC 2016 Conference, Doha, Qatar, 2016.
  - Steering Committee Member, International Symposium on Ubiquitous Networking (UNet), 2016–present.
  - Steering Committee Member, International Conference on Communications, Signal Processing, and their Applications (ICCSPA), 2013–present.
  - International Advisory Committee Member, Applied Electrical Engineering and Computing Technologies Conference (AEECT), 2013–present.

- General Co-chair, ACM Conference on Wireless Network Security (WiSec), Tucson, April 2012.
- Area TPC Chair, IEEE INFOCOM 2011, Shanghai, China, April 2011.
- Area TPC Chair, IEEE INFOCOM 2010, San Diego, March 2010.
- TPC Chair, IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM 2006), Buffalo, New York, June 2006.
- TPC Chair, IEEE International Conference on Sensor and Ad hoc Communications and Networks (SECON 2005), Santa Clara, Sep. 26-29, 2005.
- TPC Chair, IEEE INFOCOM 2004 Conference, Hong Kong, April 2004.
- TPC Chair, 9th Hot Interconnects Symposium, Stanford University, Aug. 2001.

- **Executive Committee (other than General/Technical Program Chair)**:
  - Keynote/Panel Co-chair, IEEE Wireless Communications and Networking Conference (WCNC'20): *Beyond Connectivity: What Comes After 5G*, May 2020.
  - Publicity Co-chair, IEEE INFOCOM 2003, San Francisco, March 2003.
  - Publicity Co-chair, ACM MobiCom 2002, Atlanta, Georgia, Sep. 2002.
  - Tutorials Co-chair, IEEE INFOCOM 2001 Conference, Anchorage, Alaska, April 2001.
  - Panel Chair, IEEE IPCCC 2000 Conference, Phoenix, Arizona, Feb. 2000.
  - Panel Co-chair, IEEE INFOCOM '99 Conference, New York, March 1999.

- **TPC Member**
  Served on the TPC for hundreds of international conferences in networking, security, and wireless communications. A subset of these conferences is listed here:
  - IEEE INFOCOM 2025 Conference, London, UK, May 19–22, 2025.
  - IEEE ICC 2025 Conference – Symposium on Cognitive Radio and AI-Enabled Networks, Montreal, Canada, June 8–12, 2025.
  - IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN 2025), London, UK, May 12–15, 2025.
  - IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN 2024), Washington, DC, May 13–16, 2024.
  - IEEE ICC 2024 Conference – Symposium on Cognitive Radio and AI-Enabled Networks, 2024.
  - ACM Workshop on Wireless Security and Machine Learning (WiseML 2023), Guildford, Surrey, United Kingdom, May 29 – June 1, 2023.
  - IEEE DySPAN 2021 Conference (International Symposium on Dynamic Spectrum Access Networks), December 13–15, 2021.
  - IEEE INFOCOM Conference: 2024, 2016–2013, 2009, 2007–2002, 1998.
  - IEEE GLOBECOM 2015 Conference.
  - IEEE Conference on Communications and Network Security (CNS), Florence, Italy, Sep. 2015.
  - ACM Workshop on Cognitive Radio Architectures for Broadband (CRAB): 2013, 2014.
  - 1st IEEE International Workshop on Cognitive Cellular Systems (CCS), Germany, Sep. 2014.
  - IEEE International Workshop on Network Science for Communication Networks (NetSciCom 2013), Torino, Italy, April 2013.

- European Wireless 2010 Conference (EW '2010), Lucca, Italy, April 2010.
- IEEE ICNP Conference, 2009.
- IEEE MASS, Macau SAR, China, October 5–9, 2009.
- 4th International Conference on Innovations in Information Technology (IIT2007) – Information Communication Technologies track, Dubai, UAE, November 18–20, 2007.
- ACM MobiHoc Conference: 2007, 2006, 2005.
- CrownCom 2007 (Second International Conference on Cognitive Radio Oriented Wireless Networks and Communications), Orlando, Florida, Aug. 1–3, 2007.
- International Workshop on Theoretical and Algorithmic Aspects of Sensor and Ad-hoc Networks (WTASA '07), Miami, Florida, June 28–29, 2007.
- IASTED International Conference on Modern Nonlinear Theory – Bifurcation and Chaos (MNT 2007), Montreal, Canada, May 30 – June 1, 2007.
- Global Information Infrastructure Symposium (GIIS '07), Marrakech, Morocco, July 2–5, 2007.
- WiOpt '06 (4th International Symposium on Modeling and Optimization in Mobile Ad-hoc and Wireless Networks), April 2006, Boston, Massachusetts.
- IEEE International Performance Computing and Communications Conference (IPCCC): 2006, 2003.
- Jordanian International Electrical and Electronic Engineering Conference (JIEEEC), 2005.
- Third International Workshop on Measurement, Modeling, and Performance Analysis of Wireless Sensor Networks (SenMetrics 2005), San Diego, CA, July 21, 2005.
- Multimedia Service Access Networks (MSAN) Conference, Orlando, Florida, June 2005.
- IEEE Conference on Sensors and Ad Hoc Communications and Networks (SECON): 2005, 2004.
- IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), 2004.
- Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net 2004), Bodrum, Turkey, June 2004.
- 4th Workshop on Applications and Services in Wireless Networks (ASWN 2004), Boston, Massachusetts, August 2004.
- ACM SIGMETRICS 2003 Conference, San Diego, June 2003.
- IEEE ICC 2003 Conference, Anchorage Alaska, May 2003.
- IEEE Workshop on Aspect Oriented Programming for Distributed Computing Systems (part of ICDCS 2002), July 2002.
- The 1st International Workshop on Wired/Wireless Internet Communications (WWIC 2002), Las Vegas, June 2002.
- Annual Simulation Symposium (ANSS): 2002 and 2001.
- IEEE International Conference on Computer Communications and Networks (ICCCN 2001), Scottsdale, Arizona, Oct. 2001.
- International Teletraffic Congress (ITC 2001), Salvador, Brazil, Sep. 2001.
- IEEE International Conference on Multimedia and Expo (ICME): 2000 and 2001.
- Quality of Service over Next Generation Data Networks Conference (part of the SPIE ITCom Symposium), Denver, Colorado, August 2001.

  - International Workshop on Distributed Dynamic Multiservice Architectures (sponsored by IEEE Computer Society), Phoenix, Arizona, April 2001.
  - IEEE GLOBECOM 2000, San Francisco, Dec. 2000.
  - IEEE GLOBECOM Symposium on High Speed Networks: 1999, 2000.
  - IEEE ICDCS '2000 Conference, April 2000.
  - IEEE Multimedia Systems '99 Conference, Florence, Italy, June 1999.
  - Internet Workshop '99, Japan.
  - SPIE Performance and Control of Network Systems Conference, Nov. 1997.

- **Session Chair**

  - IEEE MILCOM 2023 Conference, Boston, MA, Oct. 2023.
  - IEEE CNS 2022 Conference, Dec. 2022.
  - IEEE INFOCOM 2014 Conference, April 2014.
  - IEEE Computer Communications Workshop (CCW'12), Sedona, AZ, Nov. 2012.
  - IFIP Networking 2011, Valencia, Spain, May 2011.
  - IEEE INFOCOM 2010, San Diego, CA, March 2010.
  - IEEE INFOCOM 2006, Barcelona, Spain, April 2006 (session 9: Smart Antennas and MAC).
  - IEEE INFOCOM 2006, Barcelona, Spain, April 2006 (session 53: Wireless Power).
  - ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc 2005), Urbana-Champaign, IL, May 2005.
  - IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM 2005), Sicily, Italy, June 2005.
  - IEEE Computer Communications Workshop (CCW) 2001, Oct. 2001.
  - ACM SIGMETRICS 2000, Santa Clara, June 2000.
  - IEEE GLOBECOM 2000, San Francisco, Dec. 2000.
  - IEEE GLOBECOM '99 – Symposium on High Speed Networks.
  - IEEE INFOCOM '99 Conference, New York, March 1999.
  - IEEE ATM workshop, Aug 1996.
  - SPIE Performance and Control of Network Systems Conference, Nov. 1997.

- **Session Organizer**

  - IEEE Computer Communications Workshop (CCW'12), Sedona, AZ, Nov. 2012.
  - International Conference on Computer Communications and Networks (ICCCN'04), Chicago, Oct. 2004.
  - IEEE Computer Communications Workshop (CCW) 2001, Oct. 2001.
  - IEEE GLOBECOM 2000, San Francisco, Dec. 2000.
  - SPIE Performance and Control of Network Systems Conference, Nov. 1997.

- **Reviewer and Panelist for Research Funding Agencies**

  - National Science Foundation: CNS/NeTS (2015), EARS (2012), NetSE/Medium (2009), CAREER (2001, 2003, 2006), ECS/Integrative Systems Program (2005), etc.
  - Army Research Office (ARO).
  - King Abdulaziz City for Science and Technology (KACST) - Strategic Technologies Program (multiple times, coordinated through AAAS).
  - King Abdulaziz University for Science and Technology (KAUST) – Competitive Research Grants (CRG) program (2017).
  - Kansas Experimental Program to Stimulate Competitive Research (coordinated through AAAS).
  - Science Foundation Ireland (SFI) - multiple times.

- **Other Significant Professional Service**
  - Member of the IEEE Computer Society Fellows Evaluation Committee (2015).
  - Member of the IEEE Communications Society Outstanding Service Award Committee (2014).
  - Representative of the IEEE Technical Committee on Computer Communications (TCCC) for GLOBECOM 2000 Conference.
  - Session Organizer and Chair, 2nd NSF PI meeting, Irvine, Nov. 2000.
- Reviewer for several journals and conferences.

Department, College, and University Service

- Provost Search Advisory Committee (2023/2024): Committee is tasked with recruiting the next UA SVP for Academic Affairs and Provost.
- ECE Department Head Search Committee (2021/2022).
- Research, Innovation & Impact Faculty Foresight Council (2022 – 2024). RIIFFC is a faculty-only council that advises the Office of Research & Innovation on the aspirations, challenges, and approaches for success for research and innovation activities at the University of Arizona. It provides analysis and advice to the SVP for Research and Innovation on achieving the UA's strategic goals.
- Ad Hoc Committee for Rewriting the ECE Department Bylaws (committee chair, 2021/2022).
- Five-year Review Committee for the UA's Dean of Engineering (2015/2016).
- ECE Faculty Search Committees: 2014/2015 (3 faculty hires), 2012/2013 (3 faculty lines), 2006/2007 (committee chair, four faculty lines), 2001/2002 (one faculty line), 1999/2000 (committee chair, one faculty line).
- Faculty Status Committee (department-level P&T committee): 2007–2010, 2012–2016, and 2017–present (served 9 years, chairing the committee three times). Committee work includes soliciting letters from external reviewers, evaluating candidates for tenure and promotion as well as 3-year renewal; and making written recommendations to the department head.
- Revised Workload Guidelines and Salary Recovery Committee (2015; ad hoc committee that drafted the revised departmental workload guidelines).
- ECE Department Head Search Committee (2011).
- Search Committee for an Assistant Dean for Finance and Administration in the College of Engineering (2011).
- Department Executive Committee (2014/2015 and 2015/2016).
- UA Faculty Senate – College of Engineering representative (2010–2012).
- ECE Department Peer-review Committee (2011, 2012, 2014, 2020, 2021).
- University's Committee on Academic Freedom and Tenure (2008–2011)
- Chair, Computer Engineering Group, ECE Department (2006–2008).
- Graduate Studies Committee (1998–2000 and 2004–2006).
- Ad Hoc Committee for Revising the ECE Workload Guidelines (2004/2005).
- University Graduate Council (2003–2007).
- Prop. 301 ECE Ad Hoc Committee (Spring and Fall 2002).
- Undergraduate Studies Committee (2001/2002).
- Ad hoc Committee for Evaluating the Teaching Load (2000/2001).

- Computer Engineering Curriculum Committee (1999/2000 and 2000/2001).
- Computer Policy Committee (1998/1999, 1999/2000, 2008/2009).
- Undergraduate Student Recruitment Committee (1997).
- Scientific Integrity Oversight Member of the Oversight Committee for Prof. Christopher Walker, Dept. of Astronomy (2017-2018).

Research Scientists, Postdocs, and Graduate Student Advising

I. Mentored Research Scientists and Postdoctoral Researchers

- Mohammad Hossein Manshaei (assistant research professor, Aug. 2021 – October 2023).
  Current Position: Professor, Computer Science Department, Hunter College, City University of New York (CUNY).
- Mingjie Feng (postdoc, Sep. 2018 – Dec. 2020.)
  Current Position: Associate Professor, School of Electronic Information and Communications, Huazhong University of Science & Technology, China.
- Yong Xiao (assistant research professor, Sep. 2016 – Aug. 2018)
  Current Position: Professor, School of Electronic Information and Communications, Huazhong University of Science & Technology, China.
- Manjesh Hanawal (postdoc, April 2013 – Dec. 2013)
  Current Position: Assistant Professor, Industrial Engineering and Operations Research Dept., IIT-Bombay, India.
- Diep Nguyen (postdoc, May 2013 – Oct. 2013)
  Current Position: Senior Lecturer (equiv. to Associate Professor), School of Electrical and Data Engineering, University Technology of Sydney, Australia.
- Ossama Younis (postdoc and research assistant professor, 2005–2007)
  Current Position: Research Scientist, Advanced Network Technologies Division (ANTD), National Institute of Standards & Technology (NIST), Washington DC.
- Tao Shu (postdoc, 2004–2006)
  Current Position: Assistant Professor in Computer Science, Auburn University, Alabama.

II. Supervised Ph.D. Dissertations

1. Zhengguang Zhang, Ph.D. in May 2024 (current with Keysight Technologies, Santa Rosa).
   Dissertation title: Robust PHY-layer Signaling and Enhanced Security in Wi-Fi Systems.
2. Wenhan Zhang, Ph.D. in March 2024 (current with Apple, San Jose).
   Dissertation title: Secure Machine Learning Based RF Signal Classification for Wireless Systems.
3. Mohammed Hirzallah, Ph.D. in August 2020 (currently with Qualcomm, San Diego).
   Dissertation title: Protocols and Algorithms for Harmonious Coexistence over Unlicensed Bands in Next-Generation Wireless Networks.

4. Irmak Aykin, Ph.D. in March 2020 (currently with Qualcomm, San Diego).
   Dissertation title: Design and Implementation of Machine-learning-based Beam Management Protocols for 5G Millimeter-wave Networks.

5. Berk Akgun, Ph.D. in December 2019 (currently with Qualcomm, San Diego).
   Dissertation title: Achieving Secure Communications in Dense Multiuser MIMO Systems for 5G and Beyond.

6. Peyman Siyari, Ph.D. in April 2019 (currently with Apple, San Jose)
   Dissertation title: MIMO-based Friendly Jamming and Interference Management for Secure Wireless Communications.

7. Wessam Afifi, Ph.D. in Dec. 2016 (currently a Sr. Research and Development Engineer, Mavenir Systems)
   Dissertation title: In-band Full-duplex Wireless Communications for Dynamic Spectrum Sharing Systems.

8. Hanif Rahbari, Ph.D. in May 2016 (currently an assistant professor at Rochester Institute of Technology)
   Dissertation title: Obfuscation of Transmission Fingerprints for Secure Wireless Communications.

9. Mohammad Jamal Abdel-Rahman, Ph.D. in December 2014 (currently an Associate Professor at PSUT).
   Dissertation title: Robust Cognitive Algorithms for Fast-varying Spectrum-agile Wireless Networks.

10. Diep Nguyen, Ph.D. in April 2013 (currently an Associate Professor, University of Technology Sydney, Australia).
    Dissertation title: Resource Allocation Strategies for Cognitive and Cooperative MIMO Communications: Algorithms and Protocol Design.

11. Sisi Liu, Ph.D. in Dec. 2011 (currently a Member of Technical Staff, Broadcom Corporation).
    Dissertation title: Securing Wireless Broadcast Communication against Internal Attacks (co-advised with Prof. Loukas Lazos).

12. Tao Shu, Ph.D. in Dec. 2010 (currently an Associate Professor, Department of Computer Science, Auburn University, Alabama).
    Dissertation title: Efficient Radio Resource Management and Routing Mechanisms For Opportunistic Spectrum Access Networks.

13. Raed Al-Zubi, Ph.D. in August 2010 (currently an Assistant Professor at the University of Jordan, Amman, Jordan).
    Dissertation title: Mechanisms and Protocols for Interference Management and Resource Utilization in UWB Networks.

14. Fan Wang, Ph.D. in August 2009 (currently a senior manager of the Smart Machine team at Samsung Research, San Jose).
    Dissertation title: Utility-based resource allocation strategies and protocol design for spectrum-adaptive wireless networks.

15. Mohammad Siam, Ph.D. in April 2009 (currently an Associate Professor at Al-Isra University, Amman, Jordan).
    Dissertation title: Power-controlled channel access and routing protocols for MIMO-capable wireless networks.

16. Haythem Bany Salameh, Ph.D. in April 2009 (currently a Professor of Telecommunications at Yarmouk University, Jordan).
    Dissertation title: Channel access mechanisms and protocols for opportunistic cognitive radio networks.

17. Satyajeet Ahuja, Ph.D. in Aug. 2008 (currently with Facebook, CA).
    Dissertation title: Algorithmic solutions for constrained path selection and monitoring in wired and wireless networks.

18. Mohamed Hassan, Ph.D. in November 2005 (currently a Professor of Electrical Engineering, American University of Sharjah, United Arab Emirates).
    Dissertation title: Adaptive techniques and optimizations for media streaming over wireless channels.

19. Alaa Muqattash, Ph.D. in November 2005 (currently Founder and CEO of Advanced Business Solutions, a regional IT company specialized in delivering business software solutions to the MENA market.
    Dissertation title: Medium access control and adaptive transmission techniques in wireless networks.

20. Abdullah Balamash, Ph.D. in Aug. 2004 (currently an Associate Professor in ECE at King Abdulaziz University, Saudi Arabia).
    Dissertation title: Web traffic modeling and its application in the design of caching and prefetching systems.

21. Turgay Korkmaz, Ph.D. in Oct. 2001 (currently an Associate Professor at the University of Texas – San Antonio).
    Dissertation title: QoS routing in packet networks.

22. Jeong Geun Kim, Ph.D. degree in March 2000 (currently an Associate Professor in Radio Communication Engineering at Kyunghee University, Korea).
    Dissertation title: Providing quality-of-service guarantees in multi-service wireless networks.

III. Supervised M.S. Theses

1. Amir Hossein Yazdani Abyaneh, M.S. degree in Aug. 2022 (currently a Software Systems Engineer at Apple).

2. Harish Kumar Shankar, M.S. degree in April 2013 (currently a Software Engineer at Palo Alto Networks, Santa Clara, CA).
   Thesis title: Cooperative QoS-aware sensing/probing architecture and cross-layer protocol design for multi-rate opportunistic networks

3. Amit Kumar, M.S. degree in Dec. 2008.
   Thesis title: Modeling the short-term characteristics of Internet traffic at boundary routers.

4. Aman Arora, M.S. degree in May 2004 (currently Sr. Staff Engineer/Manager at Qualcomm).
   Thesis title: Interference-limited concurrent transmissions for wireless ad hoc networks with directional antennas.

5. Vignesh Bhvaneshwar, M.S. in Dec. 2003 (currently at Qualcomm Inc., San Diego).
   Thesis title: A cross-layer power aware protocol for wireless ad hoc networks.

6. Aytac Azgin, M.S. in Dec. 2003.
   Thesis title: Scheduling in wireless cellular networks under probabilistic channel information.

7. Michelle D'Souza, M.S. in April 2003 (currently at Mouser Electronics, Texas).
   Thesis title: Evaluating the performance of TCP over wireless links.

8. Alaa Muqattash, M.S. degree in Dec. 2002 ((currently a Member of Technical Staff at Olympus Communication Technology of America, San Diego, California).
   Thesis title: Transmission power control for wireless ad hoc networks.

9. Lifeng Zhang, M.S. in August 1999 (currently at ILS International Library Systems).
   Thesis title: Using $M/G/\infty$ processes for modeling MPEG-compressed video traffic.

10. Arivu Ramasamy, M.S. in June 1999 (currently at Cisco Systems, Inc.).
    Thesis title: WWW traffic characterization and its application in dimensioning network resources.