Curriculum Vitae of Andrea J. Goldsmith

Contact Information:

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Education:

Ph.D.	Electrical Engineering, University of California at Berkeley	1994
M.S.	Electrical Engineering, University of California at Berkeley	1991
B.S.	Engineering Mathematics, University of California at Berkeley	1986

Professional Experience:

Princeton University, Dean of Engineering and Applied Science and Arthur LeGrand Doty Professor of Electrical Engineering	09/20 – Present
Stanford University, Stephen Harris Professor of Engineering	10/12 – 08/20
Stanford Neurosciences Institute	04/13 – 08/20
Accelera/Plume Wifi, Founder, CTO, Board of Directors	08/10 – 08/14
Stanford University, Professor	05/07 – Present
Quantenna Communications (QTNA), Founder, CTO, Board of Directors	09/05 – 07/09
Stanford University, Associate Professor	09/02 – 04/07
Stanford University, Assistant Professor	01/99 – 08/02
Memorylink Corporation, Chief Scientist	05/98 – 05/02
California Institute of Technology- Assistant Professor	09/94 – 12/98
University of California, Berkeley - Research Assistant	08/89 – 08/94
AT&T Bell Laboratories, Intern and Consultant	06/91 – 08/92
MAXIM Technologies, Systems Engineer	06/86 – 09/90

Corporate Boards and Technical Advisory Boards

- Medtronic (MDT) Board of Directors. Member of the Technology Creation, Finance, and Quality Committees: 2019-Present
- Crown Castle Inc. (CCI) Board of Directors. Member of the Strategy and Corporate Governance Committees: 2018-Present
- Cohere Technical Advisory Board Chair: 2016-Present
- Quantenna (QTNA) Technical Advisory Board Chair: 2016-2018
- Interdigital (IDCC) Technical Advisory Board Chair: 2015-2018 (Member 2010-2014)
- Sequans (SQNS) Technical Advisory Board Member: 2006-Present
- Accenture (ACN) Technical Advisory Board Member: 2014-2016
- Aviat Networks (AWNW) Technical Advisory Board Member: 2010-2012

Professional Service:

- Chair: National Academy of Engineering Peer Committee on Electronics, Communication and Information Systems Engineering, Member (2018-Present)
- Vice-Chair: National Academy of Engineering Awards Committee, Member (2019-Present)
- Chair: IEEE Board of Directors Committee on Diversity, Inclusion, and Professional Ethics (2019-Present)
- Member: National Academy of Engineering Committee on Diversity and Inclusion (2019-Present)
- Presidential Adviser: Arizona State University Institute of Technology Design (2018-Present)
- Chair: IEEE Technical Activities Committee on Diversity and Inclusion (2017-Present)
- Member: IEEE Strategic Planning Committee (2017-Present)
- Member: National Science Foundation Advisory Committee for the Directorate on Computer and Information Science and Engineering (2016-Present)
- Member: Marconi Society Board of Directors (2015-Present)
- Chair: Women in Technology Leadership Roundtable Metrics Working Group (2016-Present), Roundtable Member (2015-Present)
- Chair: IEEE Technical Activities Ad Hoc Committee on Women and URMs (2015-2017)
- Chair: IEEE Bell Medal Committee (2014-2017), Member (2011-2013)
- Chair: IEEE Communications Society Emerging Technology Committee (2012-2014)
- Member: IEEE Communications Society Strategic Planning Committee (2012-2014)
- Member: Marconi Society Award Jury (2009-2011)
- President: IEEE Information Theory Society (2009), Officer (2007-2011)
- Jury Chair: BBVA Foundation Frontiers of Knowledge Award in Information and Communication Technology (2009-2012)
- Chair: IEEE Information Theory Society Claude E. Shannon Award Committee (2009)
- Chair: IEEE Information Theory Society Awards Committee (2008)
- Member: IEEE Technical Activities Board (2008-2009)
- Founder and Chair: IEEE Information Theory Society Student Committee (2005-2008)
- Board of Governors: IEEE Information Theory Society (2002-2007)
- Board of Governors: IEEE Communications Society (2005-2008)
- Committee Member: National Research Council Committee on Technology Investment for the Dept. of Homeland Security (2009-2012)
- Committee Member: National Research Council Committee on the Trends in Wireless Technology and Policy (2003-2006)
- Committee Member: National Research Council Committee on the Future of Untethered Communication (1996-1997)

Multi-University Research Leadership Roles

- Executive Committee and Lead Stanford Principle Investigator: NSF Center for Science of Information. $50M program across 11 universities and 44 professors (2008-Present)
- Lead Principle Investigator: Air Force Office of Sponsored Research, “Reduced Dimension Wireless Networks and Radio Design: Enabling new Radio Architecture and

Network Controllers via Compressed Sensing." $2.25M program across 3 universities and 3 professors (2012-2017)
- Lead Principle Investigator: NSF, "Information Acquisition, State Estimation, and Control in Cyber Physical Systems." $1M program across 3 universities and 3 professors (2013-2016)
- Lead Principle Investigator: Defense Threat Reduction Agency, "Fundamental Performance Limits in Hybrid Networks under WMD Attack." $1.2M across 2 universities and 2 professors (2008-2013)
- Lead Principle Investigator: DARPA, "Information Theory of Mobile Ad-Hoc Networks (ITMANET)." $6M program across 4 universities and 12 professors (2006-2011)
- Lead Stanford Principle Investigator: DARPA, "Mobility-Aware Resource Coordination for Optimization of Network Infrastructure (MARCONI)." $6M program across 4 universities and 8 professors, as well as researchers at Alcatel-Lucent Bell Laboratories and Lockheed Martin (2006-2008).
- Lead Stanford Principle Investigator: Army Research Office, "Dynamic Ad-Hoc Wireless Networks." $6M program across 7 universities and 12 professors (2006-2010)

Stanford Service:

- Board of Trustees Committee on Finance (2019-Present)
- Provost Appointments and Promotions Committee (2017-2019)
- Provost Budget Group (2010 – Present)
- Leadership Academy (2017-2018)
- Faculty Senate (2017-present, 2011-2015, 2006-2010, 2001-2005), Chair (2009-2010)
- Planning and Policy Board: Member (2016-2017, 2009-2013), Chair (2009-2010)
- Faculty Women's Forum Steering Committee (2016-2018)
- Committee on Research (2015-2017)
- Provost Search Committee (2016)
- Provost Task Force on Women and Leadership (2014-2016)
- Neuroscience Faculty Search Committee (2014-2015)
- Ad Hoc Committee on Women and Leadership (2013-2014)
- University Cabinet (2009-2010)
- Senate Steering Committee (2004-2005, 2009-2010)
- Commission on Undergraduate Education (2011-2012)
- Commission on Graduate Education (2005-2006)
- Vice Provost and Dean of Research Search Committee (2003)
- Chair: EE/CS Rising Stars Workshop for Aspiring Women Faculty (2016-2017)
- Founding Chair: EE Committee on Student Life (2012-2017)
- EE Faculty Search Committee (2009-2010)
- EE/CS Faculty Search Committee (2003-2004)
- Undergraduate Curriculum Committee (2000-2003), Chair (2003-2006)
- Academic Affairs Committee (1999-2004)
- Pre-major Advisor (2001-2002, 2004-2005, 2010-2013, 2015-2016

Awards and Honors:

- Qualcomm Faculty Award – 2019
- IEEE Eric E. Sumner Technical Field Award in Communications Technology – 2019
- IEEE Communication Theory Technical Committee Distinguished Service Award – 2019
- D.Sc. Honoris Causa, University of Edinburgh – 2018
- IEEE Information Theory Society Aaron D. Wyner Distinguished Service Award – 2018
- ACM Athena Lecturer Award – 2018
- IEEE iCon Award for Outstanding Achievement in Conference Innovation – 2018
- American Academy of Arts and Sciences – 2017
- National Academy of Engineering – 2017
- IEEE Communications Society Women in Communications Engineering Mentoring Award – 2017
- Thomson-Reuters/Clarivate Highly Cited Researcher (top 1%) – 2014, 2015, 2016, 2017
- IEEE Communications Society Edwin H. Armstrong Technical Achievement Award – 2014
- IEEE Communications Society Women in Communications Engineering Achievement Award – 2014
- Technical Achievement Award in Communication Theory: IEEE Communications Society – 2013
- Stephen Harris Endowed Chair in Stanford's School of Engineering – 2012
- Interdigital Innovation Award – 2012
- Silicon Valley Business Journal Women of Influence Award – 2010.
- IEEE Information Theory Society Distinguished Lecturer – 2010-2011
- Technical Achievement Award in Wireless Communications: IEEE Communications Society – 2009
- Tsinghua Distinguished Chair Professorship – 2009-2011
- IEEE Communications Society Distinguished Lecturer – 2007-2008
- Stanford Postdoc Mentoring Award – 2008
- UCSD Shannon Memorial Lecture – 2007
- Stanford Fellow – 2005
- IEEE Fellow – 2005
- Stanford School of Engineering Bredt Faculty Development Scholar – 2003
- National Academy of Engineering Gilbreth Lectureship – 2002
- Alfred P. Sloan Fellowship – 2001
- Stanford Terman Fellowship – 1999
- Okawa Foundation Award – 1999
- The Office of Naval Research Young Investigator Award 1999
- National Semiconductor Faculty Development Award – 1996, 1997
- The National Science Foundation CAREER Development Award – 1995
- IBM Fellow – 1992-1993
- David Griep Memorial Prize for Excellence in Academic Achievement – 1991

Paper Awards:

- IEEE Communications Society Best Tutorial Paper Award (Five-Year Window) – 2013

- IEEE Joint Information Theory Society and Communications Society Best Paper Award (Three-Year Window) – 2004
- IEEE Global Communications Conference, Communication Theory Symposium Best Paper Award – 2013
- Power and Energy Society General Meeting Best Paper Award – 2013
- Asia-Pacific Conference on Signal and Information Processing Best Paper Award – 2012
- IEEE Global Communications Conference Best Paper Award – 2009
- IEEE International Communications Conference, Wireless Communications Symposium Best Paper Award – 2008
- IEEE International Symposium on Information Theory Best Student Paper Award – 2007

Plenary, Keynote, and Distinguished Lectures:

- Lilian Gilbreth Lecture – Purdue University, September 2019
- Distinguished Medical and Electrical Engineering Seminar – Caltech, May 2019
- Gene Brice Colloquium, Department of Electrical and Computer Engineering, Rice University, April 2019
- Distinguished Lecture Series in Information Engineering, Cambridge University, Cambridge, UK, January 2019.
- Mercer Distinguished Lecture Series, Department of Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic, December 2018
- Athena Lecturer, Mobicom 2018, Delhi, India, October 2018
- IEEE 5G World Forum, Santa Clara, CA, September 2018
- Keynote Speaker, National Academies of Science, Engineering and Medicine Colloquium on Fifth Generation Wireless Communications, Washington DC, August 2018
- Distinguished Speaker Series, Department of Electrical Engineering and Computer Science, Northwestern University, January 2018
- Visions for Future Communications Summit, Lisbon, Portugal, October 2017
- Iran Workshop on Communications and Information Theory, Tehran, Iran, May 2017
- IEEE International Workshop on Emerging Technologies for 5G Wireless Cellular Networks, Washington DC, December 2016
- IEEE International Symposium on Wireless Communication Systems, Poznan, Poland, September 2016
- Distinguished Lecturer, Chinese University of Hong Kong, Shenzhen, China, August 2016
- Vincent Meyer Colloquium, Technion University, Jun. 2016
- Advanced Networks Colloquium, University of Maryland College Park, March 2016
- Shannon-Boole Lecture, Massachusetts Institute of Technology, February 2016
- ACM Symposium on Mobile Ad Hoc Networking, Hangzhou, China, Jun. 2015
- IEEE Personal and Indoor Mobile Radio Conference, Washington DC, September 2014
- IEEE International Symposium on Information Theory, Waikiki, HI, Jul. 2014.
- Qualcomm Technology Forum, San Diego, CA Jun. 2014
- European Wireless Conference, Barcelona, Spain, May 2014
- International Zurich Seminar on Communications, Zurich, Switzerland, February 2014
- IEEE International Conference on Communications in China, Xi'an, China, August 2013

- International Conference on Signal Processing and Communications, Kunming, China, August 2013
- IEEE Vehicular Technology Conference, Dresden, Germany, Jun. 2013
- IEEE International Workshop on Heterogeneous and Small Cell Networks, Anaheim, CA, December 2012
- Electrical Engineering Distinguished Lecture Series, University of California at Berkeley, Berkeley, CA, November 2012
- IEEE Workshop on Convergence among Heterogeneous Wireless Systems in Future Internet, Ottawa, Canada, Jun. 2012
- IEEE Wireless Communications and Networking Conference, Paris, France, March 2012
- IEEE Global Communications Conference, Miami, FL, December 2010
- IEEE Communications Society Distinguished Lecture Tour in Latin America, Sweden, and Canada, 2009
- IEEE Wireless Communications and Networking Conference, Budapest, Hungary, April 2009
- IEEE International Conference on Computers, Communications, and Networks, San Francisco, CA, August 2009
- IEEE International Symposium on Wireless Pervasive Computing, Santorini, Greece, May 2008
- Conference on Government Microcircuit Applications and Critical Technology, Las Vegas, NV, March 2008
- American Control Conference, Manhattan, NY, Jul. 2007
- IEEE Conference on Information Sciences and Systems, Princeton, NJ, March 2006.
- Workshop on Signal Processing for Wireless Communications, King's College, London, May 2006
- International Workshop on Wireless and Ad Hoc Networks, New York, NY, Jun. 2006.
- Electrical Engineering Distinguished Lecture Series, University of California at Berkeley, Berkeley, CA, February 2005
- Lillian Gilbreth Lecture, Annual National Academy of Engineering Meeting, Washington. DC, October 2002
- National Academy of Engineering Symposium on Frontiers of Engineering, Irvine, CA, March 2002
- Ernest J. Watson Lecture Series, Caltech, October 1996

Editorial Activities

- Founding Editor-in-Chief, *IEEE Journal on Selected Areas in Information Theory*, 2018-Present
- Steering Committee: *IEEE Transactions on Wireless Communications*, 2010 – 2013
- Associate Editor: *IEEE Transactions on Information Theory*, 2007 – 2009
- Editorial Board*: NoW Journal on Foundations and Trends in Communications and Information Theory*, 2006 – 2018
- Editorial Board: *NoW Journal on Foundations and Trends in Networks,* 2006 – 2018
- Guest Editor: Special issue of *IEEE Journal on Selected Areas in Communications*, 2007
- Guest Editor-in-Chief: Special issue of *IEEE Wireless Communications Magazine*, 2006
- Guest Editor-in-Chief: Special issue of *IEEE Wireless Communications Magazine*, 2002

- Guest Editor-in-Chief: Special issue of *IEEE Wireless Communications Magazine*, 1998
- Editor: *IEEE Transactions on Communications*, 1995 – 2001
- Editor: *IEEE Wireless Communications Magazine*, 1995 – 2002

Technical Meetings - Leadership Roles

- General Chair: IEEE Wireless Communications and Networking Conference, 2017. *(2018 IEEE Award for Conference Innovative Excellence)*
- General Chair: IEEE Information Theory Workshop, 2010.
- General Chair: Joint Workshop on Coding and Communications, 2008.
- General Chair: IEEE Communication Theory Symposium, 2000.
- Technical Program Committee Chair: IEEE Information Theory Symposium 2007.
- Technical Program Committee Chair: IEEE Communication Theory Workshop 1999.

Technical Meetings – Program Committee Member

- IEEE Information Theory Workshop, 2015.
- IEEE International Symposium on Information Theory, 2015.
- IEEE International Symposium on Information Theory, 2013.
- IEEE Communications Theory Workshop, 2012.
- IEEE International Symposium on Information Theory, 2012.
- IEEE International Symposium on Information Theory, 2010.
- IEEE Global Communications Conference, 2004.
- IEEE International Conference on Communications, 2002.
- IEEE Wireless Personal and Mobile Communications Conference, 2002.
- IEEE International Symposium on Signals and Systems, 2000.
- IEEE Global Communications Conference, 1999.
- IEEE International Communications Conference, 1999.
- IEEE Wireless Communications and Networking Conference, 1999.
- IEEE Global Communications Conference, 1996.
- IEEE Global Communications Conference, 1994.

Doctoral Student and Postdoc Summary:

Dr. Goldsmith has supervised the Ph.D. theses of 24 doctoral students with 3 under her current supervision. She has supervised 20 postdoctoral scholars with 3 under her current supervision.

Research Funding Summary:

Dr. Goldsmith has served as PI or co-PI on government research grants totaling more than seventy million dollars. Her research has been funded by the National Science Foundation (NSF), Defense Advanced Research Projects Agency (DARPA), the Office of Naval Research (ONR), the Air Force Office of Sponsored Research (AFOSR), the Army Research Labs (ARL), and the Defense Threat Reduction Agency (DTRA). She is currently the lead Stanford PI on a fifty million dollar NSF Center that spans 11 universities (44 faculty) and she has served as lead PI on five other multi-university research programs. She has also obtained more than two million

dollars of research support from industry, including funding from Agilent, Bosch, Cable Labs, Hitachi, Huawei, Intel, LG Electronics, National Semiconductor, NTT, Samsung, and Toyota.

Publication and Patent Summary:

Dr. Goldsmith has over 150 journal papers published or in press, two of which have won best paper awards. She has published more than 350 peer-reviewed conference papers, six of which have won best paper awards. She is the author of four textbooks, including one in preparation, and one of which has been translated into Chinese, Japanese, and Russian. She has twenty-nine issued patents with two pending. Her publications have been cited over 65,000 times in Google Scholar with an h-index of 90. Links to her publications and patents can be found at the URL: http://scholar.google.com/citations?user=cPmMoXoAAAAJ&hl=en&oi=ao

Books:

1. ***Machine Learning and Wireless Communications,*** Cambridge University Press, In Preparation. Co-editor.
2. ***Wireless Communications***, Cambridge University Press, 2005.
3. ***MIMO Wireless Communications***. Cambridge University Press, 2007. Co-author.
4. ***Principles of Cognitive Radio***, Cambridge University Press, 2012. Co-author.
5. Chapter on Wireless Communications in ***High Performance Communication Networks***, Morgan-Kaufman, New York, NY. 2000.
6. ***The Evolution of Untethered Communications*.** National Academy Press. Washington, DC, 1997. Co-author.

Journal and Magazine Papers (Invited):

1. A.J. Goldsmith, S. A. Jafar, I. Maric and S. Srinivasa, "Breaking Spectrum Gridlock with Cognitive Radios: An Information Theoretic Perspective," *Proceedings of the IEEE*, Vol. 97, No. 5, pp. 894-914, May 2009.
2. I. Maric, A.J. Goldsmith, G. Kramer and S. Shamai (Shitz), "On the Capacity of Interference Channels with One Cooperating Transmitter," *European Transactions on Telecommunications*, Vol. 19, No. 4, pp. 405-420, April 2008.
3. S. Cui and A.J. Goldsmith, "Cross-layer Design in Energy-constrained Networks Using Cooperative MIMO Techniques," *EURASIP Journal on Applied Signal Processing*, Special Issue on Advances in Signal Processing-based Cross-layer Designs, Vol. 86, No. 8, pp. 1804-1814, August 2006.
4. E. Setton, T. Yoo, X. Zhu, A.J. Goldsmith, and B. Girod, "Cross-layer Design of Ad Hoc Networks for Real-Time Video Streaming," *IEEE Wireless Communications Magazine*, Vol. 12, No. 4, pp. 99-102, August 2005.
5. S. A. Jafar, G. Foschini, and A.J. Goldsmith, "PhantomNet: Exploring optimal multicellular multiple antenna systems," *EURASIP Journal on Applied Signal*

Processing, Special Issue on MIMO Communications and Signal Processing, Vol. 84, No. 5, pp. 591-605, May 2004.

6. A.J. Goldsmith, S. A. Jafar, N. Jindal, and S. Vishwanath, "Capacity Limits of MIMO Channels," *IEEE Journal on Selected Areas in Communications*, Vol. 21, No. 5, pp. 684-702, June 2003.
7. A.J. Goldsmith and S. B. Wicker, "Design challenges for energy-constrained ad hoc wireless networks," *IEEE Wireless Communications Magazine*, Vol. 9, No. 4, pp. 8-27, August 2002.

Journal Papers:

1. F Gómez-Cuba, M Chowdhury, A Manolakos, E Erkip, A.J. Goldsmith, "Capacity scaling in a Non-coherent Wideband Massive SIMO Block Fading Channel," *IEEE Transactions on Wireless Communications*, September 2019
2. F Gómez-Cuba and A.J. Goldsmith, "Compressed Sensing Channel Estimation for OFDM with non-Gaussian Multipath Gains," *IEEE Transactions on Wireless Communications*, September 2019
3. T. R. Dean, J. R. Perlstein, M. Wootters and A. J. Goldsmith, "Fast Blind MIMO Decoding Through Vertex Hopping," *IEEE Transactions on Wireless Communications*, Vol. 18, No. 7, pp. 3669-3682, July 2019.
4. S. Rini, A. Kipnis, R. Song and A. J. Goldsmith, "The Compress-and-Estimate Coding Scheme for Gaussian Sources," *IEEE Transactions on Wireless Communications*, June 2019 (Early Access).
5. Y Morin, A Goldsmith, B Aazhang, "Estimating the Memory Order of Electrocorticography Recordings," *IEEE Transactions on Biomedical Engineering*, January 2019 (Early Access).
6. Y Murin, N Farsad, M Chowdhury, A Goldsmith, "Optimal Detection for One-Shot Transmission over Diffusion-Based Molecular Timing Channels," *IEEE Transactions on Molecular, Biological and Multi-Scale Communications*, January 2019 (Early Access).
7. A Kipnis, A.J. Goldsmith, Y.C. Eldar, "The Distortion-rate Function of Sampled Wiener Processes," IEEE Transactions on Information Theory, Vol. 65, No. 1, pp. 482-499, October 2018.
8. Y Murin, N Farsad, M Chowdhury, A Goldsmith, "Exploiting Diversity in One-Shot Molecular Timing Channels via Order Statistics, *IEEE Transactions on Molecular, Biological and Multi-Scale Communications*, Vol. 4, No. 1, pp. 14-26, March 2018.
9. T. R. Dean, M. Wootters, and A.J. Goldsmith, "Blind Joint MIMO Channel Estimation and Decoding," *IEEE Transactions on Information Theory*, Vol. 65, No. 4, pp. 2507-2524, October 2018.
10. A. Kipnis, Y. C. Eldar, A. J. Goldsmith, "Fundamental Distortion Limits of Analog-to-Digital Compression", *IEEE Transactions on Information Theory*, Vol. 64, No. 9, pp. 6013-6033, July 2018.
11. V. Jamali, N. Farsad, R. Schober and A. Goldsmith, "Non-Coherent Detection for Diffusive Molecular Communication Systems," *IEEE Transactions on Communications*, Vol. 66 , No. 6, pp. 2515-2531, June 2018.

12. A. Kipnis, Y. C. Eldar and A. J. Goldsmith, "Analog-to-Digital Compression: A New Paradigm for Converting Signals to Bits," *IEEE Signal Processing Magazine*, Vol. 35, No. 3, pp. 16-39, May 2018.
13. A. Kipnis, A. J. Goldsmith and Y. C. Eldar, "The Distortion Rate Function of Cyclostationary Gaussian Processes," *IEEE Transactions on Information Theory*, Vol. 64, No. 5, pp. 3810-3824, May 2018.
14. R. A. Sevlian, Y. Zhao, R. Rajagopal, A. Goldsmith and H. V. Poor, "Outage Detection Using Load and Line Flow Measurements in Power Distribution Systems," *IEEE Transactions on Power Systems*, Vol. 33, No. 2, pp. 2053-2069, March 2018.
15. M. Alizadeh, H. Wai, A. Goldsmith and A. Scaglione, "Retail and Wholesale Electricity Pricing Considering Electric Vehicle Mobility," *IEEE Transactions on Control of Network Systems*, Vol. 6, No. 1, pp. 249-260, February 2018.
16. Y. Murin, J Kim, J Parvizi, A. Goldsmith, "SozRank: A New Approach for Localizing the Epileptic Seizure Onset Zone," *PLOS Computational Biology*. January 2018.
17. N. Farsad, A. Goldsmith, "Neural Network Detection of Data Sequences in Communication Systems," *IEEE Transactions on Signal Processing*, Vol. 66, No. 21, pp. 5663-5678, September 2018.
18. N. Farsad, Y. Murin, W. Guo, C.-B. Chae, A. W Eckford, A. Goldsmith, "Communication System Design and Analysis for Asynchronous Molecular Timing Channels, *IEEE Transactions on Molecular, Biological and Multi-Scale Communications*, Vol. 3, No. 4, pp. 239-253, December 2017.
19. M. Alizadeh, H. Wai, M. Chowdhury, A. Goldsmith, A. Scaglione and T. Javidi, "Optimal Pricing to Manage Electric Vehicles in Coupled Power and Transportation Networks," *IEEE Transactions on Control of Network Systems*, December 2017.
20. J. M. Romero-Jerez, F. J. Lopez-Martinez, J. F. Paris and A. J. Goldsmith, "The Fluctuating Two-Ray Fading Model: Statistical Characterization and Performance Analysis," *IEEE Transactions on Wireless Communications*, Vol. 16, No. 7, pp. 4420-4432, July 2017.
21. Y. Zhao, A. Goldsmith and H. Vincent Poor, "Minimum Sparsity of Unobservable Power Network Attacks," *IEEE Transactions on Automatic Control*, Vol. 62, No. 7, pp. 3354-3368, July 2017.
22. Y. Murin, N. Farsad, M. Chowdhury, A. Goldsmith, "Time-slotted Transmission over Molecular Timing Channels," *Nano Communication Networks*, Vol. 12, pp. 12-24, June 2017.
23. Y. Chen, A. J. Goldsmith and Y. C. Eldar, "On the Minimax Capacity Loss Under Sub-Nyquist Universal Sampling," *IEEE Transactions on Information Theory*, Vol. 63, No. 6, pp. 3348-3367, June 2017.
24. M. Chowdhury, A. Manolakos and A. Goldsmith, "Multiplexing and Diversity Gains in Noncoherent Massive MIMO Systems," *IEEE Transactions on Wireless Communications*, Vol. 16, No. 1, pp. 265-277, January 2017.
25. J. Rubio, A. Pascual-Iserte, D. P. Palomar and A. Goldsmith, "Joint Optimization of Power and Data Transfer in Multiuser MIMO Systems," *IEEE Transactions on Signal Processing*, Vol. 65, No. 1, pp. 212-227, January 2017.
26. A. Manolakos, M. Chowdhury and A. Goldsmith, "Energy-Based Modulation for Noncoherent Massive SIMO Systems," *IEEE Transactions on Wireless Communications*, Vol. 15, No. 11, pp. 7831-7846, November 2016.

27. M. Chowdhury, M. Rao, Y. Zhao, T. Javidi and A. Goldsmith, "Benefits of Storage Control for Wind Power Producers in Power Markets," *IEEE Transactions on Sustainable Energy*, Vol. 7, No. 4, pp. 1492-1505, October 2016.
28. J. Chen, S. Yang, A. Özgür and A. Goldsmith, "Achieving Full DoF in Heterogeneous Parallel Broadcast Channels With Outdated CSIT," *IEEE Transactions on Information Theory*, Vol. 62, No. 7, pp. 4154-4171, July 2016.
29. M. Chowdhury, A. Manolakos and A. Goldsmith, "Scaling Laws for Noncoherent Energy-Based Communications in the SIMO MAC," *IEEE Transactions on Information Theory*, Vol. 62, No. 4, pp. 1980-1992, April 2016.
30. K. Ganesan, P. Grover, J. Rabaey and A. Goldsmith, "On the Total Power Capacity of Regular-LDPC Codes With Iterative Message-Passing Decoders," *IEEE Journal on Selected Areas in Communications*, Vol. 34, No. 2, pp. 375-396, February 2016.
31. M. Alizadeh, H. Wai, M. Chowdhury, A. Goldsmith, A. Scaglione and T. Javidi, "Joint Management of Electric Vehicles in Coupled Power and Transportation Networks," *IEEE Transactions on Control of Network Systems*, 2016.
32. S. Rini and A. Goldsmith, "A Unified Graphical Approach to Random Coding for Single-Hop Networks," *IEEE Transactions on Information Theory*, Vol. 62, No. 1, pp. 56-88, January 2016.
33. A. Kipnis, A. J. Goldsmith, Y. C. Eldar and T. Weissman, "Distortion Rate Function of Sub-Nyquist Sampled Gaussian Sources," *IEEE Transactions on Information Theory*, Vol. 62, No. 1, pp. 401-429, January 2016.
34. M. Alouini, E. Biglieri, D. Divsalar, S. Dolinar, A. J. Goldsmith and L. B. Milstein, "The Life and Work of Marvin Kenneth Simon," *IEEE Communications Surveys & Tutorials*, Vol. 19, No. 3, pp. 1551-1566, January 2016.
35. F. J. Lopez-Martinez, E. Kurniawan, R. Islam and A. Goldsmith, "Average Fade Duration for Amplify-and-Forward Relay Networks in Fading Channels," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 10, pp. 5454-5467, October 2015.
36. Y. Zhang, P. Wang and A. Goldsmith, "Rainfall Effect on the Performance of Millimeter-Wave MIMO Systems," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 9, pp. 4857-4866, Sept. 2015.
37. Y. Chen, Y. Chi and A. J. Goldsmith, "Exact and Stable Covariance Estimation From Quadratic Sampling via Convex Programming," *IEEE Transactions on Information Theory*, Vol. 61, No. 7, pp. 4034-4059, July 2015.
38. A. Manolakos, Y. Noam and A. J. Goldsmith, "Null Space Learning in Cooperative MIMO Cellular Networks Using Interference Feedback," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 7, pp. 3961-3977, July 2015.
39. M. Rao, F. J. Lopez-Martinez, M. Alouini and A. Goldsmith, "MGF Approach to the Analysis of Generalized Two-Ray Fading Models," *IEEE Transactions on Wireless Communications*, Vol. 14, No. 5, pp. 2548-2561, May 2015.
40. F. J. Lopez-Martinez, E. Martos-Naya, J. F. Paris and A. Goldsmith, "Eigenvalue Dynamics of a Central Wishart Matrix With Application to MIMO Systems," *IEEE Transactions on Information Theory*, Vol. 61, No. 5, pp. 2693-2707, May 2015.
41. D. Zahavi, L. Zhang, I. Maric, R. Dabora, A.J. Goldsmith, and S. Cui, "Diversity-Multiplexing Tradeoff for the Interference Channel with a Relay," *IEEE Transactions on Information Theory*, Vol. 61, No. 2, pp. 963 – 982, February 2015.

42. D. Zahavi, L. Zhang, I. Maric, R. Dabora, A. J. Goldsmith and S. Cui, "Diversity-Multiplexing Tradeoff for the Interference Channel With a Relay," *IEEE Transactions on Information Theory*, Vol. 61, No. 2, pp. 963-982, February 2015.
43. M. Chowdhury and A. Goldsmith, "Reliable Uncoded Communication in the SIMO MAC," *IEEE Transactions on Information Theory*, Vol. 61, No. 1, pp. 388-403, January 2015.
44. Y. Chen, A. J. Goldsmith and Y. C. Eldar, "Backing Off From Infinity: Performance Bounds via Concentration of Spectral Measure for Random MIMO Channels," *IEEE Transactions on Information Theory*, Vol. 61, No. 1, pp. 366-387, January 2015.
45. M. Chowdhury and A.J. Goldsmith, "Reliable Uncoded Communication in the SIMO MAC", *IEEE Transactions on Information Theory*, Vol. 61, No. 1, pp.388-403, January 2015.
46. Y Chen, A.J. Goldsmith, and Y.C. Eldar, "Backing off from Infinity: Performance Bounds via Concentration of Spectral Measure for Random MIMO Channels", *IEEE Transactions on Information Theory*, Vol. 61, No. 1, pp. 366 - 387, January 2015.
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48. Y. Zhao, J. Chen, A.J. Goldsmith, and H. V. Poor, "Identification of outages in Power Systems with Uncertain States and Optimal Sensor Locations", *IEEE Journal of Selected Topics in Signal Processing*, Vol. 8, No. 6, pp. 1140-1153, December 2014.
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2. G. Murray, A. Kipnis and A. J. Goldsmith, "Lossy Compression of Decimated Gaussian Random Walks," *2018 52nd Annual Conference on Information Sciences and Systems (CISS)*, Princeton, NJ, 2018, pp. 1-6.
3. T. Diamandis, Y. Murin and A. Goldsmith, "Ranking Causal Influence of Financial Markets via Directed Information Graphs," *2018 52nd Annual Conference on Information Sciences and Systems (CISS)*, Princeton, NJ, 2018, pp. 1-6.

4. N. Farsad, A. Goldsmith, “Detection Over Unknown Channels via Machine Learning,” *Proceedings of the International Zurich Seminar on Information and Communication*, February 2018.
5. N. Farsad and A. Goldsmith, "Neural Network Detectors for Molecular Communication Systems," *2018 IEEE 19th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, Kalamata, June 2018, pp. 1-5.
6. M. Rao, N. Farsad and A. Goldsmith, "Variable Length Joint Source-Channel Coding of Text Using Deep Neural Networks," *2018 IEEE 19th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, Kalamata, June 2018, pp. 1-5.
7. T. Dean, M. Chowdhury and A. Goldsmith, "Zero-Padded FDM-FDCP: Real-Time Signal Processing for Underwater Channels," *2018 IEEE 19th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, Kalamata, 2018, pp. 1-5.
8. A. A. Gebremariam, M. Chowdhury, M. Usman, A. Goldsmith and F. Granelli, "SoftSLICE: Policy-Based Dynamic Spectrum Slicing in 5G Cellular Networks," *2018 IEEE International Conference on Communications (ICC)*, Kansas City, MO, 2018, pp. 1-6.
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Patents (Issued):

1. Interference management and network performance optimization in small cells
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Inventors: Vikram Chandrasekhar, Andrea Goldsmith, Santhosh Krishna, Ritesh K Madan

2. **Systems and methods of backhaul optimization**
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Inventors: Ivana Maric, Bojan Bostjancic, Andrea Goldsmith

3. Interference management and network performance optimization in dense WiFi networks
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Filed: April 4, 2013
Date of Patent: August 15, 2017
Assignee: Plume Design, Inc.
Inventors: Andrea Goldsmith, Vikram Chandrasekhar, Ritesh K. Madan, Santhosh Krishna

4. Cloud-based management platform for heterogeneous wireless devices
Patent number: 9661515
Type: Grant
Filed: April 24, 2014
Date of Patent: May 23, 2017
Assignee: PLUME DESIGN, INC.
Inventors: Martin J. Lord, Ihab Abu-Hakima, Andrea Goldsmith, Bojan Likar

5. Analog-to-digital compression

Patent number: 9559714
Type: Grant
Filed: April 22, 2016
Date of Patent: January 31, 2017
Assignee: The Board of Trustees of the Leland Stanford Junior University
Inventors: Alon Kipnis, Andrea Goldsmith, Yonina C. Eldar

6. Energy-efficient wireless communications via feedback
Patent number: 9515774
Type: Grant
Filed: February 20, 2014
Date of Patent: December 6, 2016
Assignee: The Board of Trustees of the Leland Stanford Junior University
Inventors: Andrea Goldsmith, Seyed Reza Mir Ghaderi

7. Seamless handoff, offload, and load balancing in integrated Wi-Fi/small cell systems
Patent number: 9510256
Type: Grant
Filed: September 19, 2012
Date of Patent: November 29, 2016
Assignee: wildfire.exchange, inc (now Plume Design, Inc).
Inventors: Santhosh Krishna, Andrea Goldsmith, Michael Carlton

8. Dynamic channel selection algorithms for interference management in Wi-Fi networks
Patent number: 9497700
Type: Grant
Filed: July 31, 2015
Date of Patent: November 15, 2016
Assignee: wildfire.exchange, inc (now Plume Design, Inc).
Inventors: Ritesh K. Madan, Vikram Chandrasekhar, Andrea Goldsmith, Santhosh Krishna

9. Global and local optimization of Wi-Fi access points
Patent number: 9420528
Type: Grant
Filed: May 14, 2015
Date of Patent: August 16, 2016
Assignee: wildfire.exchange, inc (now Plume Design, Inc).
Inventors: Ritesh K. Madan, Vikram Chandrasekhar, Andrea Goldsmith, Santhosh Krishna

10. Exploiting spatial degrees of freedom in multiple input multiple output (MIMO) radio systems
Patent number: 9344162
Type: Grant
Filed: April 26, 2013
Date of Patent: May 17, 2016
Assignee: The Board of Trustees of the Leland Stanford Junior University
Inventors: Andrea Goldsmith, Yair Noam, Alexandros Manolakos, Konstantinos Dimou

11. Spectrum sharing using power split between primary and secondary transmitters
Patent number: 9204309
Type: Grant
Filed: April 6, 2011
Date of Patent: December 1, 2015
Assignees: The Board of Trustees of the Leland Stanford Junior University, Telefonaktiebolaget L M Ericsson (publ)
Inventors: Joachim Sachs, Ivana Maric, Andrea Goldsmith

12. Hidden nodes detection
Patent number: 9131392
Type: Grant
Filed: August 5, 2013
Date of Patent: September 8, 2015
Assignee: wildfire.exchange, inc (now Plume Design, Inc).
Inventors: Ritesh K. Madan, Vikram Chandrasekhar, Andrea Goldsmith, Santhosh Krishna

13. Global and local optimization of Wi-Fi access points
Patent number: 9066251
Type: Grant
Filed: August 5, 2013
Date of Patent: June 23, 2015
Assignee: wildfire.exchange, inc (now Plume Design, Inc).
Inventors: Ritesh K. Madan, Vikram Chandrasekhar, Andrea Goldsmith, Santhosh Krishna

14. Interference-cognitive transmission
Patent number: 8937884
Type: Grant
Filed: December 15, 2012
Date of Patent: January 20, 2015
Assignee: Quantenna Communications Inc.
Inventors: Andrea Goldsmith, Ravi Narasimhan

15. Secure and seamless handover between IP-based cellular networks and Wi-Fi networks
Patent number: 8867490
Type: Grant
Filed: August 24, 2012
Date of Patent: October 21, 2014
Assignee: Accelera, Inc. (now Plume Design, Inc.)
Inventors: Santhosh Krishna, Andrea Goldsmith, Michael Carlton

16. Decoding for MIMO systems
Patent number: 8705666
Type: Grant
Filed: April 4, 2011
Date of Patent: April 22, 2014

Assignee: The Board of Trustees of the Leland Stanford Junior University
Inventors: Boon Sim Thian, Andrea Goldsmith

17. Message routing in wireless mesh networks
Patent number: 8634434
Type: Grant
Filed: November 3, 2010
Date of Patent: January 21, 2014
Assignee: Quantenna Communications, Inc.
Inventors: Sam Heidari, Sigurd Schelstraete, Ravi Narasimhan, Andrea Goldsmith

18. Multiple antenna receiver system and method
Patent number: 8446998
Type: Grant
Filed: May 4, 2007
Date of Patent: May 21, 2013
Assignee: Quantenna Communications, Inc.
Inventors: Behrooz Rezvani, Farrokh Farrokhi, Andrea Goldsmith

19. Low complexity LDCP decoding
Patent number: 8407551
Type: Grant
Filed: December 15, 2009
Date of Patent: March 26, 2013
Assignee: Quantenna Communications, Inc.
Inventors: Fredrik Brannstrom, Andrea Goldsmith

20. Interference-cognitive transmission
Patent number: 8358588
Type: Grant
Filed: April 5, 2010
Date of Patent: January 22, 2013
Assignee: Quantenna Communications, Inc.
Inventors: Andrea Goldsmith, Ravi Narasimhan

21. Channel selection and interference suppression
Patent number: 8305921
Type: Grant
Filed: December 3, 2009
Date of Patent: November 6, 2012
Assignee: Quantenna Communications, Inc.
Inventors: Ravi Narasimhan, Andrea Goldsmith

22. Mitigating interference in a coded communication system
Patent number: 8111790
Type: Grant
Filed: October 20, 2008
Date of Patent: February 7, 2012
Assignee: Quantenna Communications Inc.
Inventors: Farrokh Farrokhi, Andrea Goldsmith, Fredrik Brannstrom, Behrooz Rezvani

23. System and method for decreasing decoder complexity
Patent number: 8091012
Type: Grant
Filed: May 4, 2007
Date of Patent: January 3, 2012
Assignee: Quantenna Communications Inc.
Inventors: Fredrik Brannstrom, Andrea Goldsmith

24. Wireless multimedia handset
Patent number: 8090374
Type: Grant
Filed: December 1, 2006
Date of Patent: January 3, 2012
Assignee: Quantenna Communications, Inc
Inventors: Behrooz Rezvani, Andrea Goldsmith

25. Demodulation technique for GFSK and DPSK
Patent number: 8090060
Type: Grant
Filed: May 4, 2007
Date of Patent: January 3, 2012
Assignee: Quantenna Communications, Inc.
Inventors: Fredrik Brannstrom, Andrea Goldsmith, Farrokh Farrokhi, Behrooz Rezvani

26. Optimized clipping for peak-to-average power ratio reduction
Patent number: 8073073
Type: Grant
Filed: September 24, 2007
Date of Patent: December 6, 2011
Assignee: Quantenna Communications, Inc.
Inventors: Seyed Mohammad Navidpour, Farrokh Farrokhi, Andrea Goldsmith

27. Antenna assignment system and method
Patent number: 8064835
Type: Grant
Filed: January 11, 2007
Date of Patent: November 22, 2011
Assignee: Quantenna Communications, Inc.
Inventors: Behrooz Rezvani, Andrea Goldsmith

28. Spur cancellation
Patent number: 8031101
Type: Grant
Filed: February 12, 2010
Date of Patent: October 4, 2011
Assignee: Quantenna Communications, Inc.
Inventors: Ravi Narasimhan, Andrea Goldsmith

29. Adaptive modulation scheme with simultaneous voice and data transmission
Patent number: 6304593
Type: Grant

Filed: October 6, 1998
Date of Patent: October 16, 2001
Assignee: California Institute of Technology
Inventors: Mohamed-Slim Alouini, Xiaoyi Tang, Andrea Goldsmith

Applications Under Review

1. **Systems and methods for transmitting and received data using machine learning classification.**

Publication number: 20180232574
Type: Application
Publication date: August 16, 2018
Inventors: Nariman Farsad, Andrea Goldsmith

2. **Network configuration of Wi-Fi networks via a cloud-based Wi-Fi network manager**

Publication number: 20170325106
Type: Application
Publication date: November 9, 2017
Inventors: Andrea Goldsmith, Vikram Chandrasekhar, Ritesh K. Madan, Santhosh Krishna