

Curriculum Vitae

KAPIL RAMESH DANDEKAR

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Education:

2001 Ph.D. University of Texas, Austin, Electrical and Computer Engineering (advisor: G. Xu)
1998 M.S.E. University of Texas, Austin, Electrical and Computer Engineering (advisor: G. Xu)
1997 B.S.E.E. University of Virginia, Electrical Engineering (advisor: R. Weikle)
1993 Thomas Jefferson High School for Science and Technology

Employment:

2014 – Professor, School of Biomedical Engineering Drexel University
2013 – Professor, Electrical & Computer Engineering Drexel University
2011 – Associate Dean for Research & Graduate Studies, College of Engineering Drexel University
2011 – 2015 Co-Founder, VariWaves, LLC, Exton, PA
2010 – Scientific Advisor, Adant, Inc., Santa Clara, CA
2009 – 2015 Co-Founder, MetaTenna, LLC, Exton, PA
2008 – 2011 Assistant Department Head for Graduate Affairs, Electrical & Computer Engineering, Drexel University
2007 – 2013 Associate Professor, Electrical & Computer Engineering, Drexel University
2001 – 2007 Assistant Professor, Electrical & Computer Engineering, Drexel University
1997 – 2001 Graduate Research Assistant, University of Texas, Austin
1993 – 1997 Engineer, United States Naval Research Laboratory, Washington, D.C.
1996 – 1996 Continuing Education Teacher, Fairfax County Public Schools, Fairfax, VA
1992 – 1992 Software Engineer, United States Naval Observatory, Washington, D.C.

Research Interests:

- Software defined/cognitive radio prototyping
- Reconfigurable, metamaterial, and non-traditional material antennas for wireless systems
- Functional fabrics for biomedical monitoring applications
- Smart antenna/MIMO systems for wireless communications
- Sensor networks for air quality and homeland security
- Free space optical and ultrasonic communication
- Wireless physical layer security
- Service learning and cybersecurity education

Scientific/Academic Honors:

2016	Provost's Award for Outstanding Mid-Career Scholarly Activity, Drexel University
2015	College Outstanding Research Award, Drexel University COE
2013	President's Award for Civic Engagement, Drexel University
2012	Meritorious Service Award, IEEE Educational Activities Board
2007	Department Research Award, Drexel University ECE
2006	Department Senior Design Advisor Award, Drexel University ECE Dept.
2006	Department Senior Design Advisor Award, Drexel University ECE Dept.
2006	Drexel Research Day (honorable mention), Drexel University College of Engineering
2005	Unisys Senior Design Advisor Award, Drexel University ECE Dept.
2005	Drexel Research Day (honorable mention), Drexel University College of Engineering
2004	Unisys Senior Design Advisor Award, Drexel Electrical and Computer Engineering
1999 – 2000	Microelectronics and Computer Development Fellowship, University of Texas, Austin
1997 – 1999	Basdall Gardner Endowed Graduate Fellowship, University of Texas, Austin
1997	Louis T. Rader Award, University of Virginia EE Dept.
1996	James S. Rader Award, University of Virginia EE Dept.
1998 –	Phi Kappa Phi National Honor Society
1997 –	Golden Key National Honor Society
1996 –	Eta Kappa Nu National Honor Society
1995 –	Tau Beta Pi National Honor Society
1993 – 1997	Rodman Scholar, University of Virginia School of Engineering and Applied Science
1993	Westinghouse Science Talent Search (top 300)

Research Activities

Notation used for publications in this document is as follows:

R	Refereed journal
S/R	Submitted refereed journal
C	Conference
S/C	Submitted conference
P	Patent / invention disclosure
T	Technical report / thesis / dissertation

Refereed Journal Publications:

available at <http://wireless.ece.drexel.edu>

1. S/R-2017 J. Chacko, K. Juretus, M. Jacovic, C. Sahin, N. Kandasamy, I. Savidis, and K. Dandekar, "Securing wireless communication through physical layer key based packet obfuscation," *Submitted to IEEE Transaction on Computers*, 2017.
2. S/R-2017 A. Levitt, Y. Liu, C. Knittel, K. Dandekar, C. Schauer, and G. Dion, "Metatextiles: Design, characterization and applications," *Accepted and to appear in Advanced Materials Technologies*, 2017.
3. S/R-2017 D. Patron and K. R. Dandekar, "A miniaturized reconfigurable CRLH leaky-wave antenna using complementary split-ring resonators," *Submitted to Hindawi Journal of Electrical and Computer Engineering*, 2017.

4. R-2017 H. Paaso, N. Gulati, D. Patron, A. Hakkarainen, J. Werner, K. R. Dandekar, M. Valkama, and A. Mämmelä, “DOA estimation using compact CRLH leaky-wave antennas: Novel algorithms and measured performance,” *IEEE Transactions on Antennas and Propagation*, vol. 65, no. 9, pp. 4836–4849, Sep. 2017, ISSN: 0018-926X. DOI: 10.1109/TAP.2017.2724584.
5. R-2017 H. Paaso, A. Hakkarainen, N. Gulati, D. Patron, K. R. Dandekar, M. Valkama, and A. Mämmelä, “Experimental results of novel DOA estimation algorithms for compact reconfigurable antennas,” *International Journal of Antennas and Propagation*, vol. 2017, pp. 1–13, 2017. DOI: 10.1155/2017/1613638. [Online]. Available: <https://doi.org/10.1155/2017/1613638>.
6. R-2016 A. Hakkarainen, J. Werner, K. R. Dandekar, and M. Valkama, “Analysis and augmented spatial processing for uplink OFDMA MU-MIMO receiver with transceiver I/Q imbalance and external interference,” *IEEE Transactions on Wireless Communications*, vol. 15, no. 5, pp. 3422–3439, May 2016, ISSN: 1536-1276. DOI: 10.1109/TWC.2016.2521382.
7. R-2016 R. Measel, C. S. Lester, D. J. Bucci, K. Wanuga, G. Tait, R. Primerano, K. R. Dandekar, and M. Kam, “An empirical study on the performance of wireless OFDM communications in highly reverberant environments,” *IEEE Transactions on Wireless Communications*, vol. 15, no. 7, pp. 4802–4812, Jul. 2016, ISSN: 1536-1276. DOI: 10.1109/TWC.2016.2546879.
8. R-2016 D. Patron, W. Mongan, T. P. Kurzweg, A. Fontecchio, G. Dion, E. K. Anday, and K. R. Dandekar, “On the use of knitted antennas and inductively coupled RFID tags for wearable applications,” *IEEE Transactions on Biomedical Circuits and Systems*, vol. 10, no. 6, pp. 1047–1057, Dec. 2016, ISSN: 1932-4545. DOI: 10.1109/TBCAS.2016.2518871.
9. R-2015 C. S. Lester, D. J. Bucci, R. Measel, K. Wanuga, R. Primerano, K. R. Dandekar, and M. Kam, “Performance of reconfigurable antennas in a below-decks environment,” *IEEE Antennas and Wireless Propagation Letters*, vol. 14, pp. 1093–1096, 2015, ISSN: 1536-1225. DOI: 10.1109/LAWP.2015.2394480.
10. R-2015 G. D. Sworo, K. R. Dandekar, and M. Kam, “Reconfigurable antennas and link adaptation algorithms for MIMO-OFDM wireless systems,” *EURASIP Journal on Wireless Communications and Networking*, vol. 2015, no. 1, pp. 1–15, 2015, ISSN: 1687-1499. DOI: 10.1186/s13638-015-0390-6. [Online]. Available: <http://dx.doi.org/10.1186/s13638-015-0390-6>.
11. R-2015 J. Werner, J. Wang, A. Hakkarainen, N. Gulati, D. Patron, D. Pfeil, K. Dandekar, D. Cabric, and M. Valkama, “Sectorized antenna-based DOA estimation and localization: Advanced algorithms and measurements,” *IEEE Journal on Selected Areas in Communications*, vol. 33, no. 11, pp. 2272–2286, Nov. 2015, ISSN: 0733-8716. DOI: 10.1109/JSAC.2015.2430292.
12. R-2014 M. Bielinski, G. Sosa, K. Wanuga, R. Primerano, M. Kam, and K. R. Dandekar, “Bit-loaded PAPR reduction for high-data-rate through-metal control network applications,” *IEEE Transactions on Industrial Electronics*, vol. 61, no. 5, pp. 2362–2369, May 2014, ISSN: 0278-0046. DOI: 10.1109/TIE.2013.2272283.

13. R-2014 N. Gulati and K. R. Dandekar, "Learning state selection for reconfigurable antennas: A multi-armed bandit approach," *IEEE Transactions on Antennas and Propagation*, vol. 62, no. 3, pp. 1027–1038, Mar. 2014, ISSN: 0018-926X. DOI: 10.1109/TAP.2013.2276414.
14. R-2014 D. Patron, A. S. Daryoush, and K. R. Dandekar, "Optical control of reconfigurable antennas and application to a novel pattern-reconfigurable planar design," *Journal of Lightwave Technology*, vol. 32, no. 20, pp. 3394–3402, Oct. 2014, ISSN: 0733-8724. DOI: 10.1109/JLT.2014.2321406.
15. R-2014 M. Sonkki, D. Pfeil, V. Hovinen, and K. R. Dandekar, "Wideband planar four-element linear antenna array," *IEEE Antennas and Wireless Propagation Letters*, vol. 13, pp. 1663–1666, 2014, ISSN: 1536-1225. DOI: 10.1109/LAWP.2014.2350259.
16. R-2014 K. Wanuga, R. Measel, C. S. Lester, D. J. Bucci, D. Gonzalez, R. Primerano, M. Kam, and K. R. Dandekar, "Performance evaluation of MIMO OFDM systems in on-ship below-deck environments," *IEEE Antennas and Wireless Propagation Letters*, vol. 13, pp. 173–176, 2014, ISSN: 1536-1225. DOI: 10.1109/LAWP.2014.2299758.
17. R-2013 M. Bielinski, K. Wanuga, G. Sosa, R. Primerano, M. Kam, and K. R. Dandekar, "Transceiver design for high-data rate through-metal communication in naval applications," *Naval Engineers Journal*, vol. 125, no. 1, pp. 121–126, 2013, ISSN: 0028-1425. [Online]. Available: <http://www.ingentaconnect.com/content/asne/nej/2013/00000125/00000001/art00019>.
18. R-2013 A. Hakkarainen, J. Werner, K. R. Dandekar, and M. Valkama, "Widely-linear beamforming and RF impairment suppression in massive antenna arrays," *Journal of Communications and Networks*, vol. 15, no. 4, pp. 383–397, Aug. 2013, ISSN: 1229-2370. DOI: 10.1109/JCN.2013.000069.
19. R-2013 P. Mookiah, J. M. Walsh, R. Greenstadt, and K. R. Dandekar, "Reconfigurable antenna assisted intrusion detection in wireless networks," *International Journal of Distributed Sensor Networks*, vol. 9, no. 10, 2013. DOI: 10.1155/2013/564503. eprint: <http://dsn.sagepub.com/content/9/10/564503.full.pdf+html>. [Online]. Available: <http://dsn.sagepub.com/content/9/10/564503.abstract>.
20. R-2013 D. Patron, D. Piazza, and K. R. Dandekar, "Wideband planar antenna with reconfigurable omnidirectional and directional radiation patterns," *Electronics Letters*, vol. 49, no. 8, pp. 516–518, Apr. 2013, ISSN: 0013-5194. DOI: 10.1049/e1.2013.0234.
21. R-2012 A. Fridman, S. Weber, C. Graff, D. E. Breen, K. R. Dandekar, and M. Kam, "OMAN: A mobile ad hoc network design system," *IEEE Transactions on Mobile Computing*, vol. 11, no. 7, pp. 1179–1191, Jul. 2012, ISSN: 1536-1233. DOI: 10.1109/TMC.2011.176.
22. R-2012 P. Mookiah and K. R. Dandekar, "A reconfigurable antenna-based solution for stationary device authentication in wireless networks," *International Journal of Antennas and Propagation*, 2012.
23. R-2012 K. Wanuga, M. Bielinski, R. Primerano, M. Kam, and K. R. Dandekar, "High-data-rate ultrasonic through-metal communication," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 59, no. 9, pp. 2051–2053, Sep. 2012, ISSN: 0885-3010. DOI: 10.1109/TUFFC.2012.2426.

24. R-2011 J. Kountouriotis, D. Piazza, P. Mookiah, M. D'Amico, and K. R. Dandekar, "Reconfigurable antennas and configuration selection methods for MIMO ad hoc networks," *EURASIP Journal on Wireless Communications and Networking*, vol. 2011, no. 1, pp. 1–14, 2011, ISSN: 1687-1499. DOI: 10.1186/1687-1499-2011-147. [Online]. Available: <http://dx.doi.org/10.1186/1687-1499-2011-147>.
25. R-2010 D. Hamel, M. Chwastek, S. Garcia, B. Farouk, M. Kam, and K. R. Dandekar, "Sensor placement for urban homeland security applications," *International Journal of Distributed Sensor Networks*, vol. 6, no. 1, 2010. DOI: 10.1155/2010/859263. eprint: <http://dsn.sagepub.com/content/6/1/859263.full.pdf+html>. [Online]. Available: <http://dsn.sagepub.com/content/6/1/859263.abstract>.
26. R-2010 X. Liu, J. Kountouriotis, A. P. Petropulu, and K. R. Dandekar, "ALOHA with collision resolution (ALOHA-cr): Theory and software defined radio implementation," *IEEE Transactions on Signal Processing*, vol. 58, no. 8, pp. 4396–4410, Aug. 2010, ISSN: 1053-587X. DOI: 10.1109/TSP.2010.2048315.
27. R-2010 D. Piazza, P. Mookiah, M. D'Amico, and K. R. Dandekar, "Experimental analysis of pattern and polarization reconfigurable circular patch antennas for MIMO systems," *IEEE Transactions on Vehicular Technology*, vol. 59, no. 5, pp. 2352–2362, Jun. 2010, ISSN: 0018-9545. DOI: 10.1109/TVT.2010.2043275.
28. R-2009 N. J. Kirsch, J. Kountouriotis, C. Liang, and K. R. Dandekar, "Experimental evaluation of game theoretic power allocation in MIMO ad-hoc networks," *IEEE Transactions on Wireless Communications*, vol. 8, no. 5, pp. 2292–2295, May 2009, ISSN: 1536-1276. DOI: 10.1109/TWC.2009.080863.
29. R-2009 P. Mookiah and K. R. Dandekar, "Metamaterial-substrate antenna array for MIMO communication system," *IEEE Transactions on Antennas and Propagation*, vol. 57, no. 10, pp. 3283–3292, Oct. 2009, ISSN: 0018-926X. DOI: 10.1109/TAP.2009.2028638.
30. R-2009 D. Piazza, M. D'Amico, and K. R. Dandekar, "Performance improvement of a wide-band MIMO system by using two-port RLWA," *IEEE Antennas and Wireless Propagation Letters*, vol. 8, pp. 830–834, 2009, ISSN: 1536-1225. DOI: 10.1109/LAWP.2009.2026594.
31. R-2009 D. Piazza, J. Kountouriotis, M. D'Amico, and K. R. Dandekar, "A technique for antenna configuration selection for reconfigurable circular patch arrays," *IEEE Transactions on Wireless Communications*, vol. 8, no. 3, pp. 1456–1467, Mar. 2009, ISSN: 1536-1276. DOI: 10.1109/TWC.2008.080212.
32. R-2008 R. Bhagavatula, R. W. Heath, A. Forenza, N. J. Kirsch, and K. R. Dandekar, "Impact of mutual coupling on adaptive switching between MIMO transmission strategies and antenna configurations," *Wireless Personal Communications*, vol. 52, no. 1, pp. 69–87, 2008, ISSN: 1572-834X. DOI: 10.1007/s11277-008-9513-2. [Online]. Available: <http://dx.doi.org/10.1007/s11277-008-9513-2>.
33. R-2008 D. Piazza, N. J. Kirsch, A. Forenza, R. W. Heath, and K. R. Dandekar, "Design and evaluation of a reconfigurable antenna array for MIMO systems," *IEEE Transactions on Antennas and Propagation*, vol. 56, no. 3, pp. 869–881, Mar. 2008, ISSN: 0018-926X. DOI: 10.1109/TAP.2008.916908.
34. R-2007 K. R. Dandekar, "Reviews and abstracts [review of wireless communications by andreas f. molisch; 2005]," *IEEE Antennas and Propagation Magazine*, vol. 49, no. 1, pp. 132–133, Feb. 2007, ISSN: 1045-9243. DOI: 10.1109/MAP.2007.370999.

35. R-2007 C. Liang and K. R. Dandekar, "Power management in MIMO ad hoc networks: A game-theoretic approach," *IEEE Transactions on Wireless Communications*, vol. 6, no. 4, pp. 1164–1170, Apr. 2007, ISSN: 1536-1276. DOI: 10.1109/TWC.2007.348307.
36. R-2006 M. Garfield, C. Liang, T. P. Kurzweg, and K. R. Dandekar, "MIMO space-time coding for diffuse optical communication," *Microwave and Optical Technology Letters*, vol. 48, no. 6, pp. 1108–1110, 2006, ISSN: 1098-2760. DOI: 10.1002/mop.21558. [Online]. Available: <http://dx.doi.org/10.1002/mop.21558>.
37. R-2006 D. Piazza and K. R. Dandekar, "Reconfigurable antenna solution for MIMO-OFDM systems," *Electronics Letters*, vol. 42, no. 8, pp. 446–447, Apr. 2006, ISSN: 0013-5194. DOI: 10.1049/el:20060221.
38. R-2003 K. R. Dandekar, G. Xu, and H. Ling, "Computational electromagnetic simulation of smart antenna systems in urban microcellular environments," *IEEE Transactions on Vehicular Technology*, vol. 52, no. 4, pp. 733–742, Jul. 2003, ISSN: 0018-9545. DOI: 10.1109/TVT.2003.814936.
39. R-2002 A. Arredondo, K. R. Dandekar, and G. Xu, "Vector channel modeling and prediction for the improvement of downlink received power," *IEEE Transactions on Communications*, vol. 50, no. 7, pp. 1121–1129, Jul. 2002, ISSN: 0090-6778. DOI: 10.1109/TCOMM.2002.800827.
40. R-2002 K. R. Dandekar and R. W. Heath, "Modelling realistic electromagnetic effects on MIMO system capacity," *Electronics Letters*, vol. 38, no. 25, pp. 1624–1625, Dec. 2002, ISSN: 0013-5194. DOI: 10.1049/el:20021147.
41. R-2002 K. R. Dandekar, H. Ling, and G. Xu, "Experimental study of mutual coupling compensation in smart antenna applications," *IEEE Transactions on Wireless Communications*, vol. 1, no. 3, pp. 480–487, Jul. 2002, ISSN: 1536-1276. DOI: 10.1109/TWC.2002.800546.
42. R-2002 K. R. Dandekar, A. Arredondo, H. Ling, and G. Xu, "Modeling and prediction of the wireless vector channel encountered by smart antenna systems," *Microwave and Optical Technology Letters*, vol. 35, no. 4, pp. 281–283, 2002, ISSN: 1098-2760. DOI: 10.1002/mop.10582. [Online]. Available: <http://dx.doi.org/10.1002/mop.10582>.
43. R-2000 K. R. Dandekar, H. Ling, and G. Xu, "Effect of mutual coupling on direction finding in smart antenna applications," *Electronics Letters*, vol. 36, no. 22, pp. 1889–1891, Oct. 2000, ISSN: 0013-5194. DOI: 10.1049/el:20001309.
44. R-2000 T. Su, K. Dandekar, and H. Ling, "Simulation of mutual coupling effect in circular arrays for direction-finding applications," *Microwave and Optical Technology Letters*, vol. 26, no. 5, pp. 331–336, 2000, ISSN: 1098-2760. DOI: 10.1002/1098-2760(20000905)26:5<331::AID-MOP17>3.0.CO;2-M. [Online]. Available: [http://dx.doi.org/10.1002/1098-2760\(20000905\)26:5%3C331::AID-MOP17%3E3.0.CO;2-M](http://dx.doi.org/10.1002/1098-2760(20000905)26:5%3C331::AID-MOP17%3E3.0.CO;2-M).

Patents / Patent Applications:

1. P-2017 P. Mookiah, K. R. Dandekar, J. M. Walsh, and R. Greenstadt, "Reconfigurable antenna based solutions for device authentication and intrusion detection in wireless networks," Granted Patent US 9560073 B2, Jan. 31, 2017. [Online]. Available: <https://lens.org/106-813-625-021-285>.

2. P-2017 D. Patron and K. R. Dandekar, "Miniaturized reconfigurable crlh metamaterial leaky-wave antenna using complementary split-ring resonators," Patent Application US 2017/0062943 A1, Mar. 2, 2017. [Online]. Available: <https://lens.org/064-554-017-450-785>.
3. P-2017 D. Piazza, J. Kountouriotis, M. D'amico, K. R. Dandekar, and M. Prathaban, "Reconfigurable antennas and configuration selection methods for ad-hoc networks," Granted Patent US 9565717 B2, Feb. 7, 2017. [Online]. Available: <https://lens.org/154-431-661-889-695>.
4. P-2017 R. A. Primerano, M. Kam, K. R. Dandekar, and C. Gindhart, "System for ultrasonic communication across curved metal surfaces," Patent Application US 2017/0163354 A1, Jun. 8, 2017. [Online]. Available: <https://lens.org/009-300-299-172-327>.
5. P-2016 R. Bahl, N. Gulati, K. R. Dandekar, and D. L. Jaggard, "Reconfigurable antennas for performance enhancement of interference networks employing interference alignment," Granted Patent US 9236955 B2, Jan. 12, 2016. [Online]. Available: <https://lens.org/055-323-420-597-758>.
6. P-2016 G. Dion, K. R. Dandekar, Y. Gogotsi, D. Patron, K. A. Jost, M. N. Le, J. W. Fisher, S. J. Watt, and A. C. Cook, "Wearable power harvesting system," Patent Application US 2016/0261031 A1, Sep. 8, 2016. [Online]. Available: <https://lens.org/087-981-505-663-641>.
7. P-2016 C. Sahin and K. R. Dandekar, "Symmetric encryption key generation using wireless physical layer information without sharing any information pertinent to the key," Provisional Patent Application 62/261,761, Mar. 25, 2016.
8. P-2016 B. Shishkin, D. H. Nguyen, C. Sahin, K. R. Dandekar, N. Kandasamy, and D. J. Dorsey, "Real-time and protocol-aware reactive jamming in wireless networks," Granted Patent US 9531497 B2, Dec. 27, 2016. [Online]. Available: <https://lens.org/027-425-829-451-932>.
9. P-2015 A. K. Fontecchio, K. R. Dandekar, and T. Kurzweg, "Transparent conformal polymer antennas for RFID and other wireless communications applications," Granted Patent US 8922435 B2, Dec. 30, 2015. [Online]. Available: <https://lens.org/152-136-971-858-718>.
10. P-2015 N. Gulati, D. Gonzalez, and K. R. Dandekar, "Method for selecting state of a reconfigurable antenna in a communication system via machine learning," Granted Patent US 8942659 B2, Jan. 27, 2015. [Online]. Available: <https://lens.org/060-411-476-783-550>.
11. P-2015 L. Henderson, C. Sahin, D. Nguyen, J. Chacko, and K. R. Dandekar, "STEM education using augmented reality," Provisional Patent Application 62/261,761, Dec. 1, 2015.
12. P-2015 P. Mookiah and K. Dandekar, "Bi-directional magnetic permeability enhanced metamaterial (MPEM) substrate for antenna miniaturization," Granted Patent US 9035831 B2, May 19, 2015. [Online]. Available: <https://lens.org/155-431-023-245-162>.
13. P-2015 D. Patron, K. R. Dandekar, and D. Piazza, "Wide band reconfigurable planar antenna with omnidirectional and directional radiation patterns," Patent Application US 2015/0349418 A1, Dec. 3, 2015. [Online]. Available: <https://lens.org/049-915-594-440-20X>.

14. P-2015 D. Piazza, M. D Amico, and K. R. Dandekar, "Metamaterial reconfigurable antennas," Granted Patent US 9196970 B2, Nov. 24, 2015. [Online]. Available: <https://lens.org/149-550-978-764-779>.
15. P-2014 K. R. Dandekar, G. Dion, A. K. Fontecchio, T. P. Kurzweg, D. Patron, and O. Montgomery, "Smart knitted fabrics," Patent Application WO 2014/138204 A1, Sep. 12, 2014. [Online]. Available: <https://lens.org/136-412-983-697-622>.
16. P-2014 K. R. Dandekar and P. Mookiah, "MIMO antenna arrays built on metamaterial substrates," Granted Patent US 8836608 B2, Sep. 16, 2014. [Online]. Available: <https://lens.org/186-769-156-760-11X>.
17. P-2014 D. Piazza, J. Kountouriotis, M. D Amico, and K. R. Dandekar, "Systems and methods for selecting reconfigurable antennas in MIMO systems," Granted Patent US 8908787 B2, Dec. 9, 2014. [Online]. Available: <https://lens.org/010-135-383-040-369>.
18. P-2012 R. Primerano, K. Wanuga, M. Bielinski, K. Dandekar, M. Kam, and G. Sosa, "Joint PAPR reduction and rate adaptive ultrasonic OFDM physical layer for high data rate through-metal communications," Patent Application WO 2012/162655 A1, Nov. 29, 2012. [Online]. Available: <https://lens.org/134-788-077-047-225>.

Conference Publications:

available at <http://wireless.ece.drexel.edu>

1. S/C-2017 S. Begashaw and K. Dandekar, "Performance analysis of a reconfigurable antenna array in WLAN channel models," in *Proc. of the IEEE APS/URSI 2017 Conference (to appear)*, 2017.
2. S/C-2017 J. Chacko, M. Jacovic, C. Sahin, N. Kandasamy, and K. Dandekar, "Independent source architecture for developing FPGA-based physical layer security techniques," in *Proc. of the IEEE Military Communications Conference (to appear)*, 2017.
3. S/C-2017 D. Nguyen, A. Paatelma, H. Saarnisaari, N. Kandasamy, and K. Dandekar, "Sub-microsecond network synchronization for distributed wireless phy protocols," in *Proc. of the ACM S3 Workshop at Mobicom (to appear)*, 2017.
4. S/C-2017 S. Wolfe, S. Begashaw, Y. Liu, and K. Dandekar, "Adaptive link optimization for 802.11 uav uplink using a reconfigurable antenna," in *Proc. of the IEEE Military Communications Conference (to appear)*, 2017.
5. C-2017 O. Bshara, Y. Liu, S. Begashaw, and K. R. Dandekar, "Computational electromagnetic simulation and performance analysis of reconfigurable antennas for outdoor 60 GHz applications," in *2017 IEEE Radio and Wireless Symposium (RWS)*, Jan. 2017, pp. 38–41. DOI: 10.1109/RWS.2017.7885939.
6. C-2017 J. Chacko, K. Juretus, M. Jacovic, C. Sahin, N. Kandasamy, I. Savidis, and K. Dandekar, "Physical gate based preamble obfuscation for securing wireless communication," in *2017 International Conference on Computing, Networking and Communications (ICNC)*, Jan. 2017, pp. 293–297. DOI: 10.1109/ICNC.2017.7876142.
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Theses and Technical Reports:

1. T-2017 J. Chacko, "FPGA-based reconfigurable physical layer architecture for wireless applications," PhD thesis, Drexel University, Philadelphia, PA, May 2017.
2. T-2017 D. Nguyen, "Agile spectrum-sharing wireless systems using software-defined radios and reconfigurable antennas," PhD thesis, Drexel University, Philadelphia, PA, Aug. 2017.
3. T-2017 S. Wolfe, "Adaptive link optimization for 802.11 uav uplink using a reconfigurable antenna," Master's thesis, Drexel University, Philadelphia, PA, May 2017.
4. T-2016 B. Katz, "Enabling real-time wireless channel based encryption key generation," Master's thesis, Drexel University, Philadelphia, PA, Sep. 2016.
5. T-2016 D. H. Nguyen, M. Jacovic, I. Rasheed, and K. R. Dandekar, "Radio Frequency Coordination at the Democratic National Convention," Drexel University, Wireless System Laboratory, Tech. Rep., 2016.
6. T-2016 D. H. Nguyen, A. Paatelma, H. Saarnisaari, N. Kandasamy, and K. R. Dandekar, "Enhancing Indoor Spatial Reuse through Adaptive Beamsteering," Drexel University, Wireless System Laboratory, Tech. Rep., 2016.
7. T-2015 D. Patron, "Compact reconfigurable antennas for wireless systems and wearable applications," PhD thesis, Drexel University, Philadelphia, PA, Jun. 2015.
8. T-2012 R. Bahl, "Impact of reconfigurable antennas on interference alignment," Master's thesis, University of Pennsylvania, Philadelphia, PA, Aug. 2012.
9. T-2012 M. Bielinski, "Adaptive algorithm for high data rate through-metal communication," Master's thesis, Drexel University, Philadelphia, PA, Jun. 2012.
10. T-2012 M. Chernyavskiy, "Compact multifunctional dipole antenna array for MIMO systems," Master's thesis, Drexel University, Philadelphia, PA, Jun. 2012.
11. T-2011 P. Mookiah, "Reconfigurable antennas for wireless network security," PhD thesis, Drexel University, Philadelphia, PA, Sep. 2011.

12. T-2011 G. Sosa, "A joint bit-loading and symbol rotation scheme for multi-carrier systems," Master's thesis, Drexel University, Philadelphia, PA, Dec. 2011.
13. T-2010 M.-E. Dumitru, "FPGA implementation of diversity and spatial multiplexing for MIMO free space optical interconnects," Master's thesis, Drexel University, Philadelphia, PA, Sep. 2010.
14. T-2010 S. Vora, "Design and analysis of a FSO MIMO transmitter receiver circuit compatible with space time coding," Master's thesis, Drexel University, Philadelphia, PA, Sep. 2010.
15. T-2009 N. Kirsch, "Experimental analysis of power control and element spacing for unobtrusive MIMO antenna systems," PhD thesis, Drexel University, Philadelphia, PA, Jun. 2009.
16. T-2009 D. Piazza, "Reconfigurable antennas for adaptive MIMO communication systems," PhD thesis, Drexel University, Philadelphia, PA, Jun. 2009.
17. T-2008 R. Dragone, "Quantifying the effect of mutual coupling in Ultra-Wideband-Multi-Band Multiple Input Multiple Output systems," Master's thesis, Drexel University, Philadelphia, PA, Jun. 2008.
18. T-2008 D. Pfeil, "MIMO diffuse free space optical transceiver design," Master's thesis, Drexel University, Philadelphia, PA, Jun. 2008.
19. T-2006 C. Liang, "A game-theoretic approach to power management in MIMO-OFDM ad hoc networks," PhD thesis, Drexel University, Philadelphia, PA, Sep. 2006.
20. T-2001 K. R. Dandekar, "Space division multiple access systems: Computational electromagnetic studies of the physical and network layers," PhD thesis, University of Texas at Austin, Austin, TX, May 2001.
21. T-1998 —, "Multi-model interaction techniques: The hobbes virtual reality application development system," U.S. Naval Research Laboratory, Tech. Rep. 5510-98-9876, Apr. 1998.

Students:

- Students Currently Supervised:
 - Alex Lackpour (part-time Ph.D. candidate)
 - Simon Begashaw (Ph.D.)
 - Oday Bshara (Ph.D.)
 - Cem Sahin (Ph.D.)
 - Marko Jacovic (Ph.D.)
 - Yuqiao Liu (Ph.D.)
 - Ilhaan Rasheed (Ph.D.)
 - Xaime Rivas Rey (Ph.D.)
 - Gayatri Lakshmanan (M.S.)
 - Shihao Song (M.S.)
 - Erfaun Noorani (BS/MS)
- Students Graduated:

James Chacko (Ph.D., 2017) (co-advised with Naga Kandasamy)
 Danh Nguyen (Ph.D., 2017) (co-advised with Naga Kandasamy)
 Nikhil Gulati (Ph.D., 2015)
 Damiano Patron (Ph.D., 2015)
 George Sworo (Ph.D., 2015) (co-advised with Moshe Kam)
 Ryan Measel (Ph.D., 2014) (co-advised with Moshe Kam)
 John Kountouriotis (Ph.D., 2013)
 Prathaban Mookiah (Ph.D., 2011)
 Nicholas Kirsch (Ph.D., 2009)
 Daniele Piazza (Ph.D., 2009)
 Chao Liang (Ph.D., 2006)

Khyati Ved (M.S., 2017)
 Chase Hamilton (M.S., 2017)
 Stephen Wolfe (M.S., 2017)
 Brandon Katz (M.S., 2016)
 Mikhail Chernyavskiy (M.S., 2012)
 Guillermo Sosa (M.S., 2011)
 Mihnea Elian Dumitru (M.S., 2010)
 Sai Chinta (M.S., 2009)
 Doug Pfeil (M.S., 2008)
 Rocco Dragone (M.S., 2008)
 David Hamel (M.S., 2007)
 Michael Warde (M.S., 2007)
 Matthew Chwastek (M.S., 2007)
 William Norman (M.S., 2007)
 Matthew Garfield (M.S., 2006)
 Abhishek Khemka (M.S., 2006)
 Sumant Kawale (M.S., 2004)
 Maralle Fakhereddin (M.S., 2004)

Grants:

Notation used for grants and proposals in this document is as follows:

RG	Research Grant (funded)
EG	Equipment Grant (funded)

1. RG-2001 “Employing Wireless LAN standards for communication between TOC vehicles - Phase 2,” *PI*: Athina Petropulu, *Co-Is*: Kapil R. Dandekar, Army CECOM (Applied Communications and Information Networking Program), \$70,000, (2001-2002).
2. RG-2002 “Employing Wireless LAN standards for communication between TOC vehicles - Phase 2 Extension,” *PI*: Athina Petropulu, *Co-Is*: Kapil R. Dandekar, Army CECOM (Applied Communications and Information Networking Program), \$28,000, (2002-2003).
3. RG-2003 “Employing Wireless LAN standards for communication between TOC vehicles - Phase 1 Extension,” *PI*: Athina Petropulu, *Co-Is*: Kapil R. Dandekar, Army CECOM (Applied Communications and Information Networking Program), \$68,000, (2003-2004).

4. RG-2003 “ACIN Phase III: Communication for Subterranean and Urban Environments,” *PI*: Kapil R. Dandekar, *Co-Is*: Afshin Daryoush, Athina Petropulu, Army CECOM (Applied Communications and Information Networking Program), \$600,000, (2003-2004).
5. RG-2003 “Ad-Hoc Link Capability over Link-16,” *PI*: Kapil R. Dandekar, *Co-Is*: None, Sarnoff Corporation, \$10,000, (2003-2003).
6. RG-2003 “Collaborative Research - Applied Electromagnetic Characterization of Wideband Multi-Array Communication,” *PI*: Kapil R. Dandekar, *Co-Is*: Robert W. Heath, Jr. (University of Texas at Austin), National Science Foundation, \$273,000, (2003-2007).
7. RG-2003 “Practical Strategies using Smart Antennas for Ad-Hoc Networking,” *PI*: Kapil R. Dandekar, *Co-Is*: Harish Sethu, National Science Foundation, \$520,000, (2003-2007).
8. RG-2003 “MIMO Ad Hoc Battlefield Networks in Dense Urban Environments,” *PI*: Kapil R. Dandekar, *Co-Is*: Robert W. Heath, Jr. and Scott Nettles (University of Texas at Austin), National Instruments, \$18,000, (2003-2004).
9. EG-2003 “Equipment for MIMO Ad Hoc Battlefield Networks in Dense Urban Environments,” *PI*: Kapil R. Dandekar, *Co-Is*: Robert W. Heath, Jr. and Scott Nettles (University of Texas at Austin), National Instruments, \$250,000, (2003-2004).
10. EG-2003 “Hardware for MIMO Transceiver,” *PI*: Kapil R. Dandekar, *Co-Is*: Robert W. Heath, Jr. and Scott Nettles (University of Texas at Austin), Texas Instruments, \$60,000, (2003-2004).
11. RG-2004 “ACIN Phase IV: Modeling and Simulation,” *PI*: Harish Sethu, *Co-Is*: Kapil R. Dandekar, David Breen, Moshe Kam, Spiros Mancoridis, and Steven Weber, Army CECOM (Applied Communications and Information Networking Program), \$212,000, (2004-2005).
12. RG-2004 “Exploiting Flexible PHYs in Networks: Prototypes and Algorithms,” *PI*: Kapil R. Dandekar, *Co-Is*: Scott Nettles, Robert W. Heath, Jr., Jeff Andrews, Gustavo de Veciana, and Sanjay Shakkotai (University of Texas at Austin), National Science Foundation, \$100,000, (2004-2007).
13. EG-2004 “MIMO Multi-Hop Network Integrated Research and Education Plan using NI Products,” *PI*: Kapil R. Dandekar, *Co-Is*: Robert W. Heath, Jr. and Scott Nettles (University of Texas at Austin), National Instruments, \$180,000, (2004-2005).
14. RG-2005 “ACIN Phase V: Modeling and Simulation in Support of COMPOSER,” *PI*: Moshe Kam, *Co-Is*: Kapil R. Dandekar, David Breen, Timothy Kurzweg, Frank Lee, Spiros Mancoridis, and Steven Weber, Army CECOM (Applied Communications and Information Networking Program), \$1,195,000, (2005-2006).
15. RG-2005 “ACIN Phase V: Modeling and Simulation in Support of Communications,” *PI*: Steven Weber, *Co-Is*: Kapil R. Dandekar, Moshe Kam, Jay Modi, and Bill Regli, Army CECOM (Applied Communications and Information Networking Program), \$300,000, (2005-2006).
16. RG-2005 “ACIN Phase V: RFID-based Integrated Authentication, Localization, and Sense Through the Wall System,” *PI*: Gary Friedman, *Co-Is*: Kapil R. Dandekar and Adam Fontecchio, Army CECOM (Applied Communications and Information Networking Program), \$500,000, (2005-2006).
17. RG-2005 “Thru-Hull Communication for Naval Communications,” *PI*: Moshe Kam, *Co-Is*: Kapil R. Dandekar, Office of Naval Research, \$95,000, (2005-2007).

18. RG-2005 “MIMO Diffuse Optical Local Area Networks,” *PI*: Kapil R. Dandekar, *Co-Is*: Timothy Kurzweg, National Science Foundation, \$270,000, (2005-2008).
19. EG-2005 “Hardware for Research and Education in Software Defined Radio,” *PI*: Kapil R. Dandekar, *Co-Is*: None, Analog Devices, \$5,000, (2005-2006).
20. EG-2006 “Drexel University Anechoic Chamber Testing (DUACT) System,” *PI*: Kapil R. Dandekar, *Co-Is*: Mun Choi and Moshe Kam, National Security Agency, \$70,000, (2006-2007).
21. RG-2007 “ACIN Phase VI: Modeling and Simulation in Support of COMPOSER,” *PI*: Moshe Kam, *Co-Is*: Kapil R. Dandekar, Timothy Kurzweg, Spiros Mancoridis, and Steven Weber, Army CECOM (Applied Communications and Information Networking Program), \$541,000, (2006-2007).
22. RG-2007 “ACIN Phase VI: Modeling and Simulation in Support of Communications: MIMO,” *PI*: Kapil R. Dandekar, *Co-Is*: Moshe Kam and Steven Weber, Army CECOM (Applied Communications and Information Networking Program), \$200,000, (2006-2007).
23. RG-2007 “ACIN Phase VI: Ultrawideband Localization: Bridge Funding to Phase VII,” *PI*: Adam Fontecchio, *Co-Is*: Kapil R. Dandekar and Gary Friedman, Army CECOM (Applied Communications and Information Networking Program), \$50,000, (2006-2007).
24. RG-2007 “ACIN Phase VI: Modeling and Simulation in Support of Communications,” *PI*: Steven Weber, *Co-Is*: Kapil R. Dandekar and Moshe Kam, Army CECOM (Applied Communications and Information Networking Program), \$320,000, (2006-2007).
25. RG-2008 “ACIN Phase VII: Modeling and Simulation in Support of CJSMP/COMPOSER,” *PI*: Kapil R. Dandekar, *Co-Is*: David Breen, Moshe Kam, Timothy Kurzweg, and Spiros Mancoridis, Army CECOM (Applied Communications and Information Networking Program), \$500,000, (2007-2008).
26. RG-2008 “ACIN Phase VII: Modeling and Simulation in Support of Communications,” *PI*: Steven Weber, *Co-Is*: Kapil R. Dandekar, David Breen, and Moshe Kam, Army CECOM (Applied Communications and Information Networking Program), \$625,000, (2007-2008).
27. RG-2008 “ACIN Phase VII: WiMAX,” *PI*: William Regli, *Co-Is*: Kapil R. Dandekar, Army CECOM (Applied Communications and Information Networking Program), \$200,000, (2007-2008).
28. EG-2008 “Wireless Antenna Measurement and Prototyping System,” *PI*: Kapil R. Dandekar, *Co-Is*: Mun Choi and Moshe Kam, National Security Agency, \$43,000, (2007-2008).
29. RG-2009 “ACIN Phase VIII: MIMO for Tactical Radio,” *PI*: Kapil R. Dandekar, *Co-Is*: , Army CECOM (Applied Communications and Information Networking Program), \$107,000, (2008-2009).
30. RG-2009 “ACIN Phase VIII: Conductive Polymer Antennas,” *PI*: Adam Fontecchio, *Co-Is*: Kapil R. Dandekar, Tim Kurzweg, Army CECOM (Applied Communications and Information Networking Program), \$300,000, (2008-2009).
31. RG-2009 “ACIN Phase VIII: CREW,” *PI*: Moshe Kam, *Co-Is*: Kapil R. Dandekar and John Walsh, Army CECOM (Applied Communications and Information Networking Program), \$500,000, (2008-2009).

32. RG-2009 “ACIN Phase VIII: Modeling and Simulation in Support of CJSMP/COMPOSER,” *PI*: Kapil R. Dandekar, *Co-Is*: David Breen, Moshe Kam, Timothy Kurzweg, and Spiros Mancoridis, Army CECOM (Applied Communications and Information Networking Program), \$300,000, (2008-2009).
33. RG-2009 “ACIN Phase VIII: Modeling and Simulation in Support of Communications,” *PI*: Steven Weber, *Co-Is*: Kapil R. Dandekar, David Breen, and Moshe Kam, Army CECOM (Applied Communications and Information Networking Program), \$200,000, (2008-2009).
34. RG-2009 “ACIN Phase VIII: Cognitive Networking,” *PI*: Steven Weber, *Co-Is*: Kapil R. Dandekar, David Breen, and Moshe Kam, Army CECOM (Applied Communications and Information Networking Program), \$200,000, (2008-2009).
35. RG-2009 “ACIN Phase VIII: WiMAX,” *PI*: William Regli, *Co-Is*: Kapil R. Dandekar and Youngmoo Kim, Army CECOM (Applied Communications and Information Networking Program), \$700,000, (2008-2009).
36. RG-2010 “ACIN Phase 9: MIMO for Tactical Radio,” *PI*: Kapil R. Dandekar, *Co-Is*: None, Army CERDEC (Applied Communications and Information Networking Program), \$200,000, (2009-2010).
37. RG-2010 “ACIN Phase 9: CREW,” *PI*: Moshe Kam, *Co-Is*: Kapil R. Dandekar, John Walsh, Army CERDEC (Applied Communications and Information Networking Program), \$400,000, (2009-2010).
38. RG-2010 “ACIN Phase 9: M&S for Communications,” *PI*: Steven Weber, *Co-Is*: Kapil R. Dandekar, David Breen, Army CERDEC (Applied Communications and Information Networking Program), \$200,000, (2009-2010).
39. RG-2010 “ACIN Phase 9: Cognitive Networking,” *PI*: Steven Weber, *Co-Is*: Kapil R. Dandekar, David Breen, Army CERDEC (Applied Communications and Information Networking Program), \$200,000, (2009-2010).
40. RG-2010 “MRI: Development of SDC Testbed for Radio and Optical Wireless Networking,” *PI*: Kapil R. Dandekar, *Co-Is*: Timothy Kurzweg, Adam Fontecchio, Youngmoo Kim, Jeremy Johnson, National Science Foundation, \$1,269,440, (2009-2013).
41. RG-2010 “II-NEW: MIMO Software Defined Communications Testbed for Radio and Optical Wireless Networking,” *PI*: Kapil R. Dandekar, *Co-Is*: Timothy Kurzweg, Adam Fontecchio, Youngmoo Kim, Nagarajan Kandasamy, National Science Foundation, \$707,517, (2009-2012).
42. RG-2010 “NETS: Small: Cognitive Antennas for Wireless Ad Hoc Networks,” *PI*: Kapil R. Dandekar, *Co-Is*: Moshe Kam, Jaudelice de Oliveira, National Science Foundation, \$582,637, (2009-2012).
43. RG-2010 “NETS: Medium: Collaborative Research: Cooperative beamforming for efficient and secure wireless communication,” *PI*: Athina Petropulu, *Co-Is*: Kapil R. Dandekar, National Science Foundation, \$399,942, (2009-2012).
44. RG-2010 “NTI: Printing RFID Antenna using Nanoparticle Inks,” *PI*: Kapil R. Dandekar, *Co-Is*: Timothy Kurzweg, Adam Fontecchio, Benjamin Franklin Nanotechnology Institute, \$79,990, (2009-2010).
45. RG-2010 “A Platform for Analyzing the RF Environment on Naval Vessels,” *PI*: Moshe Kam, *Co-Is*: Kapil R. Dandekar, DURIP, \$280,000, (2009-2010).
46. RG-2010 “Antenna Project Bridge Funding,” *PI*: Kapil R. Dandekar, *Co-Is*: Adam Fontecchio, Timothy Kurzweg, Drexel University, \$100,000, (2009-2010).

47. RG-2010 “ACIN Phase 10: Cognitive Networking,” *PI*: Steven Weber, *Co-Is*: Kapil R. Dandekar, David Breen, Moshe Kam, Army CERDEC (Applied Communications and Information Networking Program), \$400,000, (2010-2011).
48. RG-2010 “A Framework for Wireless Network Security Based on Reconfigurable Antennas,” *PI*: Kapil R. Dandekar, *Co-Is*: John Walsh, Rachel Greenstadt, NSF, \$369,928, (2010-2013).
49. RG-2010 “Cognitive Antenna System (CAS),” *PI*: Kapil R. Dandekar, *Co-Is*: None, Lockheed Martin, \$12,214, (2009-2010).
50. EG-2010 “Dandekar Equipment,” *PI*: Kapil R. Dandekar, *Co-Is*: None, Drexel University, \$0, (2009-2010).
51. RG-2011 “Below-Decks Electromagnetic Environment Characterization for RF Wireless Network Operation,” *PI*: Kam, *Co-Is*: Kapil R. Dandekar, Office of Naval Research, \$88,000, (2010-2011).
52. RG-2011 “ACIN Phase 11: Cognitive Networking,” *PI*: Weber, *Co-Is*: Kapil R. Dandekar, Army CERDEC (Applied Communications and Information Networking Program), \$400,000, (2011-2012).
53. RG-2011 “A Meso-Scale GENI WiMAX Project,” *PI*: Kapil R. Dandekar, *Co-Is*: Kam, National Science Foundation, \$105,472, (2011-2014).
54. RG-2011 “Reconfigurable Antenna-based Enhancement of Dynamic Spectrum Access Algorithms,” *PI*: Kapil R. Dandekar, *Co-Is*: Weber, National Science Foundation, \$527,814, (2011-2014).
55. RG-2011 “Maternity “smart fabric bellyband” to monitor uterine activity,” *PI*: Adam Fontecchio, *Co-Is*: Kapil R. Dandekar, Genevieve Dion, Timothy Kurzweg, Owen Montgomery, Coulter Foundation, \$120,000, (2011-2012).
56. RG-2011 “Freedom Rings,” *PI*: Kapil R. Dandekar, *Co-Is*: Youngmoo Kim, Urban Affairs Coalition, \$4,255,080, (2011-2013).
57. RG-2011 “E-MIDDAS - Enhanced-Mobile Integrated Diagnostic and Data Analysis System,” *PI*: Rich Primerano, *Co-Is*: Kapil R. Dandekar, Timothy Kurzweg, John Lacontora, L3, \$89,293, (2011-2012).
58. RG-2011 “Hybrid Wireless Network on chips,” *PI*: Baris Taskin, *Co-Is*: Kapil R. Dandekar, National Science Foundation, \$471,726, (2011-2015).
59. RG-2011 “Securing the Wireless Philadelphia Network,” *PI*: Steven Weber, *Co-Is*: Kapil R. Dandekar, Spiros Mancoridis, Harish Sethu, National Science Foundation, \$1,080,445, (2011-2016).
60. RG-2011 “Development and Dissemination of the Drexel University Cybersecurity Program,” *PI*: Kapil R. Dandekar, *Co-Is*: Steven Weber, Rachel Greenstadt, Chris Yang, Constantine Katsinis, National Science Foundation, \$888,491, (2011-2015).
61. RG-2012 “Real-Time Feature Detection and Threat Analysis with USRP SDR,” *PI*: Kapil R. Dandekar, *Co-Is*: None, Lockheed Martin, \$100,000, (2012-2013).
62. RG-2012 “Performance Estimation and Optimization of REDHAWK SDR Applications,” *PI*: Hempstead, *Co-Is*: Kapil R. Dandekar, Kam, Johnson, Ventura Solutions, Inc, \$215,461, (2012-2013).
63. RG-2012 “Below-Decks Electromagnetic Environment Characterization for RF Wireless Network Operation, Phase III,” *PI*: Kam, *Co-Is*: Kapil R. Dandekar, Primerano, ONR, \$226,985, (2012-2014).
64. RG-2013 “EAGER: US Ignite: A Cloud Enabled Virtual Reality Based Pedagogical Ecosystem for Green Energy and Environmental Engineering Education,” *PI*: Abichandani, *Co-Is*: Kapil R. Dandekar, Foster, NSF, \$329,505, (2013-2016).

65. RG-2013 “The Finder,” *PI*: Kapil R. Dandekar, *Co-Is*: Primerano, Kurzweg, Fontecchio, Westpal Finder Inc., \$150,000, (2013-2014).
66. RG-2013 “Ultrasonic Programming of Artillery Fuses, Phase I,” *PI*: Primerano, *Co-Is*: Kapil R. Dandekar, Kam, Picatinny Arsenal, \$73,174, (2013-2015).
67. RG-2013 “GAANN: Graduate Fellowships in Education with a Focus on the National Academy of Engineering Grand Challenges,” *PI*: Fontecchio, *Co-Is*: Kapil R. Dandekar et al., Department of Education, \$134,172, (2013-2015).
68. RG-2013 “NACME Scholar Program 2013-2014,” *PI*: Kapil R. Dandekar, *Co-Is*: Rodriguez, National Action Council for Minorities in Engineering, \$2,500, (2013-2014).
69. RG-2013 “Phase 3: Maternity ”smart fabric bellyband” to monitor uterine activity and assess fetal well being,” *PI*: Fontecchio, *Co-Is*: Kapil R. Dandekar, Dion, Kurzweg, Mongan, Montgomery, Coulter, \$131,118, (2013-2014).
70. RG-2013 “Performance Estimation and Optimization of REDHAWK SDR Applications: Task 2,” *PI*: Hempstead, *Co-Is*: Kapil R. Dandekar, Johnson, Ventura Solutions, Inc, \$111,901, (2013-2014).
71. RG-2014 “Knit Smart Textiles for Biomedical Sensing and Actuation,” *PI*: Kapil R. Dandekar, *Co-Is*: G. Dion, A. Fontecchio, O. Montgomery, V. Narayan, National Science Foundation, \$799,577, (2014-2017).
72. RG-2014 “Enhanced Interference Alignment for Networks using Reconfigurable Antennas,” *PI*: Kapil R. Dandekar, *Co-Is*: Kandasamy, National Science Foundation, \$489,417, (2014-2017).
73. RG-2014 “Ultrasonic Programming of Artillery Fuses, Phase II,” *PI*: Primerano, *Co-Is*: Kapil R. Dandekar, Kam, Picatinny Arsenal, \$188,180, (2014-2015).
74. RG-2015 “WiFiUS: Future Small-Cell Networks using Reconfigurable Antennas,” *PI*: Kapil R. Dandekar, *Co-Is*: Weber, National Science Foundation, \$199,997, (2015-2017).
75. RG-2015 “NRT IGE: Pedagogical Readiness Oversight for Future Educators in STEM Subjects (PROFESS),” *PI*: Fontecchio, *Co-Is*: Stanford, Marendra, Silverman, Kapil R. Dandekar, NSF, \$498,848, (2015-2018).
76. RG-2015 “Secure Wireless Control for Future Naval Smart Grids,” *PI*: Kapil R. Dandekar, *Co-Is*: C. Nwankpa, K. Miu, J. de Oliveira, and S. Weber, ONR, \$749,830, (2015-2018).
77. RG-2015 “CPS: TTP Option: Synergy: Sensing, Processing, and Actuation of Biomedical Smart Textiles for Deep Venous Thrombosis Prevention,” *PI*: Kapil R. Dandekar, *Co-Is*: Montgomery, Dion, Abichandani, Fontecchio, NIH, \$1,488,873, (2015-2018).
78. RG-2015 “PFI: BIC (REU): Wearable Smart Textiles Based on Programmable and Automated Knitting Technology for Biomedical and Sensor Actuation Applications,” *PI*: Kapil R. Dandekar, *Co-Is*: None, NSF, \$14,000, (2015-2018).
79. RG-2015 “Secure Wireless Control for Future Naval Smart Grids,” *PI*: Kapil R. Dandekar, *Co-Is*: Nwankpa, Miu, DeOliveria, Weber, Office of Naval Research, \$852,031, (2015-2018).
80. RG-2015 “Science Learning+ Supporting Identity Change Through Immersive Interactive Technologies ,” *PI*: Rank, *Co-Is*: Kapil R. Dandekar, Muschio, Foster, Allen, NSF, \$1,725,540, (2017-2019).
81. RG-2016 “SaTC: EDU: Software Defined Radio Wars for Cybersecurity and Information Assurance Education,” *PI*: Kapil R. Dandekar, *Co-Is*: Kandasamy, Abichandani, Stanford, Rank, NSF, \$299,890, (2016-2018).

82. RG-2016 “II-NEW: Scalable Software Defined Radio Network Testbed for Hybrid Measurement and Emulation,” *PI*: Kapil R. Dandekar, *Co-Is*: Weber, Taskin, Mainland, NSF, \$850,000, (2016-2019).
83. RG-2016 “EAGER: SC2: Team Dragon Radio,” *PI*: Kapil R. Dandekar, *Co-Is*: Mongan, Weber, Kandasamy, Mainland, NSF, \$99,978, (2016-2017).
84. RG-2016 “PFI: BIC (Travel Supplement) Wearable Smart Textiles Based on Programmable and Automated Knitting Technology for Biomedical and Sensor Actuation Applications,” *PI*: Kapil R. Dandekar, *Co-Is*: None, NSF, \$4,523, (2016-2017).
85. RG-2016 “Cybersecurity Workforce Education CNAP Initiatives,” *PI*: Weber, *Co-Is*: Kapil R. Dandekar, Savidis, Stamm, NSA, \$255,360, (2016-2017).
86. RG-2016 “Development of Aerial Dragnet Testbed,” *PI*: Kapil R. Dandekar, *Co-Is*: Fontecchio, Kurzweg, Abichandani, Kotsos, DARPA/LMCO, \$1,420,553, (2016-2017).
87. RG-2016 “Analytics on Real-Time Biometrics from Passive Wearable Smart-Garments,” *PI*: Mongan, *Co-Is*: Kapil R. Dandekar, Fontecchio, CURE, \$89,952, (2016-2017).

Teaching Activities

Summary of Courses Taught:

The following lists the courses taught in Fall (F), Winter (W), and Spring (S) terms of each of the five years since the beginning of the academic year 2001-2002. Graduate courses and undergraduate courses are denoted as G and UG respectively. Course evaluation data is provided using the mean of the “overall instructor rating” for the respective course.

	Term	Level	Number	Title	Students	Avg. Eval.
	F 2001-02	UG	ECE-S306	Introduction to Modulation and Coding	31	5.0/5.0
	W 2001-02	G	ECE-T612	Advanced Telecomm. Engineering II	25	4.6/5.0
	S 2001-02	UG	ECE-S306	Introduction to Modulation and Coding	21	5.0/5.0
	F 2002-03	UG	ECE-S306	Introduction to Modulation and Coding	15	5.0/5.0
	W 2002-03	G	ECE-T612	Advanced Telecomm. Engineering II	20	4.6/5.0
	S 2002-03	UG	ECE-S306	Introduction to Modulation and Coding	25	4.8/5.0
	F 2003-04	UG	ECE-S306	Introduction to Modulation and Coding	15	3.8/5.0
	W 2003-04	G	ECE-T612	Advanced Telecomm. Engineering II	20	4.0/5.0
	S 2003-04	UG	ECE-S306	Introduction to Modulation and Coding	15	4.8/5.0
	F 2004-05	UG	ECE-S306	Introduction to Modulation and Coding	9	3.5/5.0
	W 2004-05	G	ECE-T512	Wireless Systems	22	4.5/5.0
	S 2004-05	UG	ECE-S306	Introduction to Modulation and Coding	12	5.0/5.0
	F 2005-06	UG	ECE-S306	Introduction to Modulation and Coding	15	4.5/5.0
	W 2005-06	G	ECE-T512	Wireless Systems	20	4.6/5.0
	F 2006-07	UG	ECE-S306	Introduction to Modulation and Coding	16	4.3/5.0
	W 2006-07	G	ECE-T512	Wireless Systems	21	4.7/5.0
	S 2006-07	UG	ECE-S306	Introduction to Modulation and Coding	18	4.0/5.0
	F 2007-08	UG	ECE-S306	Introduction to Modulation and Coding	16	N/A
	W 2007-08	G	ECE-T512	Wireless Systems	13	N/A
	S 2007-08	UG	ECE-S306	Introduction to Modulation and Coding	11	N/A
	F 2008-09	UG	ECE-S306	Introduction to Modulation and Coding	11	N/A
	W 2008-09	G	ECE-T512	Wireless Systems	14	4.6/5.0
	S 2008-09	UG	ECE-S306	Introduction to Modulation and Coding	5	4.8/5.0
	F 2009-10	UG	ECE-S306	Introduction to Modulation and Coding	17	4.4/5.0
	W 2009-10	G	ECE-T512	Wireless Systems	10	4.8/5.0
	S 2009-10	UG	ECE-S306	Introduction to Modulation and Coding	12	4.9/5.0
	F 2010-11	UG	ECE-S306	Introduction to Modulation and Coding	3	N/A
	W 2010-11	G	ECE-T512	Wireless Systems	19	N/A
	S 2010-11	UG	ECE-S306	Introduction to Modulation and Coding	5	N/A

F	2011-12	UG	ECE-S306	Analog and Digital Communications	8	
W	2011-12	G	ECE-T512	Wireless Systems	30	4.0/5.0
S	2011-12	UG	ECE-S306	Analog and Digital Communications	7	4.5/5.0
F	2012-13	UG	ECE-S306	Analog and Digital Communications	13	4.6/5.0
W	2012-13	G	ECE-T512	Wireless Systems	16	4.1/5.0
S	2012-13	UG	ECE-S306	Analog and Digital Communications	7	4.0/5.0
F	2013-14	UG	ECE-S306	Analog and Digital Communications	17	5.0/5.0
W	2013-14	G	ECE-T512	Wireless Systems	17	4.8/5.0
S	2013-14	UG	ECE-S306	Analog and Digital Communications	14	4.5/5.0
S	2013-14	G	ECE-T890	ST:Software Defined Radio Security Lab	9	3.2/5.0
F	2014-15	UG	ECE-S306	Analog and Digital Communications	15	5.0/5.0
W	2014-15	G	ECE-T512	Wireless Systems	11	4.6/5.0
S	2014-15	UG	ECE-S306	Analog and Digital Communications	14	5.0/5.0
F	2015-16	UG	ECE-S306	Analog and Digital Communications	21	4.5/5.0
W	2015-16	G	ECE-T512	Wireless Systems	15	4.4/5.0
S	2015-16	UG	ECE-S306	Analog and Digital Communications	12	5.0/5.0
S	2015-16	G	ECE-T680	ST: Cognitive Radio	8	4.3/5.0
F	2016-17	UG	ECE-S306	Analog and Digital Communications	16	N/A
W	2016-17	G	ECE-T512	Wireless Systems	9	4.6/5.0
S	2016-17	G	ECE-T680	Collaborative Intelligent Radios	13	N/A

Senior Design Projects Supervised:

Year	Project Title	Co-Advisor
2002-03	Modulation and Coding Laboratory Component Design	
2002-03	MIMO RF Transceiver Development	Daryoush
2002-03	Ad-Hoc Network Simulation and Visualization in Urban Environments	
2003-04	Instrumentation for Measuring Reaction Time in Close Quarter Combat Training <i>Sponsor: Naval Research Laboratory</i>	
2004-05	Rapid Detection Localization of Threats in an Urban Environment	Kam
2004-05	Urban Threat Response Simulation	Kam
2004-05	Transceiver Design and Evaluation for Wireless Optical LAN	Kurzweg
2004-05	Inkjet Printing of a Polymer Antenna	Fontecchio
2005-06	Hybrid Ultrasonic/Wireless Networks for Naval Applications <i>Sponsor: Office of Naval Research</i>	Kam
2005-06	SDR Testbed for Rapid Prototyping of MIMO Systems <i>Sponsor: National Science Foundation</i>	Kurzweg

2006-07	Ultra-Wideband Software Defined Radio Prototyping of Multiple Input Multiple Output Systems	Fontecchio
2007-08	EPICS:Simulation and Quantification of Particulate Matter Emissions in Philadelphia <i>Sponsor:</i> Philadelphia Clean Air Council	Kam
2007-08	EPICS:Information Kiosk for Philadelphia Non-Profit Organizations <i>Sponsor:</i> Philadelphia Legal Assistance	Fontecchio
2007-08	MIMO Based Micro-Optical Interconnects <i>Sponsor:</i> National Science Foundation	Kurzweg
2007-08	Localization of Ingested Radio Smart Pill	Kurzweg
2008-09	EPICS:Air Quality Sensor Network for Philadelphia <i>Sponsor:</i> Philadelphia Clean Air Council and IEEE	Kurzweg
2008-09	WiMAX Software Defined Radio Implementation <i>Sponsor:</i> National Science Foundation	
2009-10	Software Framework for a Cognitive Radio Testbed with Reconfigurable Antennas <i>Sponsor:</i> National Science Foundation	
2009-10	EPICS:Air Quality Sensor Network for Philadelphia <i>Sponsor:</i> Philadelphia Clean Air Council and IEEE	Kurzweg
2010-11	EPICS:Air Quality Sensor Network for Philadelphia <i>Sponsor:</i> Philadelphia Clean Air Council and IEEE	
2011-12	EPICS:Air Quality Hardware <i>Sponsor:</i> Philadelphia Clean Air Council and IEEE	Primerano
2011-12	EPICS:Air Quality Software <i>Sponsor:</i> Philadelphia Clean Air Council and IEEE	Primerano
2011-12	Wireless Philadelphia Network Re-design - Infrastructure	Primerano
2011-12	Wireless Philadelphia Network Re-design - Applications	Primerano
2013-14	Real Time Reactive Jamming in Wireless Networks <i>Sponsor:</i> National Science Foundation	
2014-15	Wireless Power Transfer for Smart Textile Applications <i>Sponsor:</i> National Science Foundation	
2014-15	Smart Onesie for Sudden Infant Death Syndrome (SIDS) detection <i>Sponsor:</i> National Science Foundation	
2015-16	Wireless Security Testbed Demonstration <i>Sponsor:</i> National Science Foundation	
2015-16	Software Infrastructure for Secure and Scalable Medical Sensor Networks <i>Sponsor:</i> National Science Foundation	
2016-17	Dragon Radio for DySPAN and DARPA SC2 <i>Sponsor:</i> National Science Foundation	
2016-17	Wearable Device For Data Collection to Monitor DVT Risk <i>Sponsor:</i> National Science Foundation	Mongan
2016-17	High-performance Computing Platform for Real-time Radio Spectrum Analysis <i>Sponsor:</i> National Science Foundation	Kandasamy

Professional Service Activities

Professional Society Membership:

	Date	Activity
1.	1995-Pres.	Institute of Electrical and Electronics Engineers (IEEE) Antennas and Propagation society member Communications society member Vehicular Technology society member
	2007-2010	IEEE Educational Activities Board
	2013-2015	
	2007-Pres	IEEE Senior member

Professional Society Officer/Chair:

	Date	Position	Description
1.	2002-2010	Chair	IEEE Philadelphia section Vehicular Technology Society
2.	2007-2014	Chair	IEEE Philadelphia section Com/IT Society
3.	2007-2010	Member (Chair)	IEEE Educational Activities Board (Pre-University Education Coordinating Committee)
4.	2008-2015	Leader	EPICS in IEEE Initiative
5.	2013-2015	Chair	IEEE Educational Activities Board (University Resources Committee Chair)

Conference Sessions Chaired/Organized:

	Date	Conference Activity
1.	2004	IEEE Radio and Wireless Conference Technical program committee member MIMO Technologies session chair
2.	2006	IEEE Radio and Wireless Symposium Technical program committee member
3.	2007	IEEE Radio and Wireless Symposium Technical program committee member MIMO Technologies subcommittee chair
4.	2007	IEEE Vehicular Technology Conference Technical program committee member
5.	2008	IEEE Radio and Wireless Symposium Technical program committee member
6.	2008	IEEE Vehicular Technology Conference Technical program committee member
7.	2009	IEEE Vehicular Technology Conference Technical program committee member
8.	2011	IEEE International Workshop on Wireless Network Measurements (WinMEE) Technical program committee member
9.	2011	IEEE International Workshop on Wireless Network Measurements (WinMEE)

10. 2012 Technical program committee member
Crowncom 2012
11. 2012 Technical program committee member
IEEE International Workshop on Wireless Network Measurements (WinMEE)
12. 2013 Technical program committee member
Crowncom 2013
13. 2014 Technical program committee member
Crowncom 2014
14. 2015 Technical program committee member
VTC 2015
WiFiUS special session workshop co-organizer

Workshops Organized:

- | | Date | Workshop |
|----|-------------|--|
| 1. | 2003 | MIMO Technologies Workshop
IEEE Radio and Wireless Conference |
| 2. | 2012 | EPICS in IEEE
Virtual Conference |

Journal Editorships:

- | | Date | Journal |
|----|-------------|---|
| 1. | 2002-2007. | IEEE Transactions on Vehicular Technology
Associate Editor |
| 2. | 2007-2011 | IEEE eLearning (formerly ExpertNow)
Editorial Board Member |

University Service Activities

Associate Dean for Research and Graduate Studies, Drexel College of Engineering, 2011-Pres

- Responsibilities:
 - Member of Drexel Associate Deans for Research Committee
 - Member of Drexel Graduate Associate Deans Committee
 - Member of Drexel University Research Strategic Plan Implementation group
 - Administration for all COE submitted proposals, overhead share, and cost-sharing
 - COE-wide business development and strategic planning
 - Administer COE-wide research projects and fellowship programs
 - Research coordination with COE department heads
 - Liaison to Government Relations office
 - Liaison to Office of Technology Commercialization
 - Liaison to Institutional Advancement
 - US News and World Report reporting
 - Co-chair of COE Graduate Committee
 - Supervisor for Director of Research Development
 - Supervisor for Graduate and Research Program Manager
 - Supervisor for Database Manager
- Notable accomplishments:
 - Co-chair of University Advisory Committee on Graduate Education that led to creation of Graduate College
 - Re-formation of College Graduate and Research Committee
 - Creation of multi-college facilitated networking events and seed grant program
 - Design and implementation of RCM-based graduate tuition model
 - Organization of panels to support junior faculty
 - Supported launch of new laboratory safety training system
 - Supported launch of new Cybersecurity Institute and efforts in Peace Engineering
 - Expansion of Graduate Co-operative Education program
 - Creation of College-wide PhD open house recruitment day
 - Launch of new, multi-college MS degree program in Cybersecurity
 - US News and World Report data analysis

Assistant Department Head for Graduate Affairs, Drexel ECE, 2008-2011

- Responsibilities:
 - Chair of ECE Graduate Committee
 - Liaison to University Office of Graduate Studies
 - Representative on COE Graduate Committee
 - Liaison to Office of Graduate Admissions
 - Liaison to Graduate Fellowship Office
 - Liaison to University Registrar for course scheduling, room, and instructor assignment
 - Co-managed faculty and teaching assistant assignments
 - EPAF approval for all ECE graduate students
 - Managed grade submission for all research, thesis, dissertation, and graduate co-op students
 - Organized course offering planning activities in Department
 - Teaching assistant assignment
 - Handled academic probation and dismissals for graduate students
 - Responsible for graduate student graduation clearance
 - Liason to graduate co-op office
 - Oversaw graduate student recruitment
 - Adjunct faculty point of contact for Department
 - Managed graduate course change and proposal paperwork with Academic Senate
 - Day to day graduate student advising with Chad Morris
- Notable accomplishments:
 - Two year course offering plan
 - Substantially revamped graduate and undergraduate course offerings to be more directly linked to student population size
 - Conducted cohort based graduation analysis to track graduate student retention and graduation rates (report created by Academic Information Systems to my specification is now available university wide)
 - New PhD candidacy exam format
 - Created and managed updates to Department research website
 - Improved mechanism for graduate student recruitment (website for application review)
 - Dual degree program with Politecnico di Milano
 - Academic affiliates program with Rowan University