

## **Roy D. Yates**

Wireless Information Network Laboratory (WINLAB)  
Department of Electrical and Computer Engineering  
Rutgers, The State University of New Jersey  
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### **Education**

Ph.D. in Electrical Engineering and Computer Science, 1990, *M.I.T.* Cambridge, MA.  
M.S. in Electrical Engineering and Computer Science, 1986, *M.I.T.* Cambridge, MA.  
B.S.E. in Electrical Engineering and Computer Science with high honors, 1983, *Princeton University* Princeton, NJ.

### **Employment**

2013 – now: Distinguished Professor of Electrical and Computer Engineering, Rutgers University.  
2002 – 2013: Professor of Electrical and Computer Engineering, Rutgers University.  
2001 – 2018: Associate Director of WINLAB, Rutgers University.  
1999 – 2000: Interim Director of WINLAB, Rutgers University.  
1996 – 2002: Associate Professor of Electrical and Computer Engineering, Rutgers University.  
1990 – 1996: Assistant Professor of Electrical and Computer Engineering, Rutgers University.

### **Awards**

Rutgers Engineering Governing Council ECE Teaching Award, 2015.  
IEEE Fellow, 2011.  
Rutgers University Faculty Scholar-Teacher Award 2010-2011.  
Schwarzkopf Award for Technological Innovation, 2009.  
Best Paper in the Wireless Communications Symposium, IEEE International Communications Conference, ICC 2006.  
Best Testbed Paper, 2nd International Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities, Tridentcom 2006.  
Marconi Prize Paper Award, *IEEE Transactions on Wireless Communication*, best paper for 2002.  
AT&T Bell Laboratories Fellowship 1985–1989.

**Journal Publications**

- [1] Roy D. Yates and Sanjit K. Kaul. The age of information: Real-time status updating by multiple sources. *IEEE Trans. Info. Theory*, 65(3):1807–1827, March 2019.
- [2] Y. Sun, E. Uysal-Biyikoglu, R. D. Yates, C. E. Koksall, and N. B. Shroff. Update or wait: How to keep your data fresh. *IEEE Trans. Info. Theory*, 63(11):7492–7508, November 2017.
- [3] R.D. Yates and H. Mahdavi-Doost. Energy harvesting receivers: Packet sampling and decoding policies. *IEEE J. Sel. Areas Commun.*, 33(3):558–570, 2015.
- [4] N. Krishnan, R.D. Yates, and N.B. Mandayam. Uplink linear receivers for multi-cell multiuser MIMO with pilot contamination: Large system analysis. *IEEE Trans. Wireless Commun.*, 13(8):4360–4373, 2014.
- [5] J.S. Panchal, R.D. Yates, and M.M. Buddhikot. Mobile network resource sharing options: Performance comparisons. *IEEE Trans. Wireless Commun.*, 12(9):4470–4482, 2013.
- [6] D.N.C. Tse and R.D. Yates. Fading broadcast channels with state information at the receivers. *IEEE Trans. Info. Theory*, 58(6):3453–3471, June 2012.
- [7] N. Krishnan, R.D. Yates, N.B. Mandayam, and J.S. Panchal. Bandwidth sharing for relaying in cellular systems. *Wireless Communications, IEEE Transactions on*, 11(1):117–129, January 2012.
- [8] L.H. Gropop, D.N.C. Tse, and R.D. Yates. Interference alignment for line-of-sight channels. *Information Theory, IEEE Transactions on*, 57(9):5820–5839, September 2011.
- [9] C. Raman, G.J. Foschini, R.A. Valenzuela, R.D. Yates, and N.B. Mandayam. Half-duplex relaying in downlink cellular systems. *Wireless Communications, IEEE Transactions on*, 10(5):1396–1404, May 2011.
- [10] Zang Li, R. Yates, and W. Trappe. Achieving secret communication for fast Rayleigh fading channels. *Wireless Communications, IEEE Transactions on*, 9(9):2792–2799, September 2010.
- [11] I. Maric and R. Yates. Bandwidth and power allocation for cooperative strategies in Gaussian relay networks. *IEEE Trans. Info. Theory*, 56(4):1880–1889, April 2010.
- [12] J. Lei, L. Greenstein, and R. Yates. Link gain matrix estimation in distributed large-scale wireless networks. *EURASIP Journal on Wireless Networks and Communications*, 2010:10:1–10:12, April 2010. Special Issue on Simulators and Experimental Testbeds Design and Development for Wireless Networks.
- [13] S. Kokalj-Filipovic, P. Spasojevic, and R. Yates. Geographic data propagation in location-unaware wireless sensor networks: A two-dimensional random walk analysis. *IEEE J. Sel. Areas Commun.*, 27(7):1158–1168, September 2009.

- [14] W. H. Yuen, S. C. Mau, and R. D. Yates. Existence of data and multiuser diversities in noncooperative mobile infostation networks. *IEEE Trans. Mob. Comput.*, 8(8):1117–1131, 2009.
- [15] J. Acharya and R. Yates. Dynamic spectrum allocation for uplink users with heterogeneous utilities. *IEEE Trans. Wireless Commun.*, 8(3):1405–1413, March 2009.
- [16] J. Lei, R. Yates, and L. Greenstein. A generic model for optimizing single-hop transmission policy of replenishable sensors. *IEEE Trans. Wireless Communications*, 8(2):547–551, February 2009.
- [17] J. Lei, R. Yates, L. Greenstein, and H. Liu. Mapping link SNRs of real-world wireless networks onto an indoor testbed. *IEEE Trans. Wireless Commun.*, 8(1):157–165, January 2009.
- [18] R. Liu, I. Maric, P. Spasojevic, and R. Yates. Discrete memoryless interference and broadcast channels with confidential messages: Secrecy rate regions. *IEEE Trans. Info. Theory*, pages 2493–2507, June 2008.
- [19] I. Maric, R. Yates, and G. Kramer. Capacity of interference channels with partial transmitter cooperation. *IEEE Trans. Info. Theory*, 53(10):3536–3548, October 2007.
- [20] M. K. Karakayali, R. Yates, and L. Razumov. Downlink throughput maximization in CDMA wireless networks. *IEEE Trans. Wireless Commun.*, 5(12):3492–3500, Dec 2006.
- [21] L. Lin, R. Yates, and P. Spasojevic. Adaptive transmission with finite code rates. *IEEE Trans. Info. Theory*, 52(5):1847–1860, May 2006.
- [22] Jianghong Luo, Roy Yates, and Predrag Spasojevic. Service outage based power and rate allocation for parallel fading channels. *IEEE Trans. Info. Theory*, 51(7):2594–2611, July 2005.
- [23] I. Maric and R. Yates. Cooperative multicast for maximum network lifetime. *IEEE J. Sel. Areas Commun.*, 23(1):127–135, Jan. 2005. Special issue on wireless ad hoc networks.
- [24] I. Maric and R. Yates. Cooperative multihop broadcast for wireless networks. *IEEE J. Sel. Areas Commun.*, 22(6):1080–1088, Aug. 2004. Special issue on fundamental performance limits of wireless sensor networks.
- [25] S. Ulukus and R. Yates. User capacity of asynchronous CDMA systems with matched filter receivers and optimum signature sequences. *IEEE Trans. Info. Theory*, 50(5):903–909, May 2004.
- [26] L. Lin, R. Yates, and P. Spasojevic. Adaptive transmission with discrete code rates and power levels. *IEEE Trans. Commun.*, 51(12):2115–2125, Dec. 2003.

- [27] J. Luo, L. Lin, R. Yates, and P. Spasojević. Service outage based power and rate allocation. *IEEE Trans. Info. Theory*, 49(1):323–330, Jan 2003.
- [28] R. Sinha, A. Yener, and R. Yates. Noncoherent multiuser communications: Multistage detection and selective filtering. *EURASIP Journal on Applied Signal Processing*, 12:1415–1426, 2002.
- [29] M. Saquib and R. Yates. Analysis of a partial decorrelator in a multi-cell DS-CDMA system. *IEEE Trans. Commun.*, 50(12):1895–1898, Dec. 2002.
- [30] A. Yener, R. D. Yates, and S. Ulukus. Combined multiuser detection and beamforming for CDMA systems: Filter structures. *IEEE Transactions on Vehicular Technology*, 51(5):1087–1095, Sept 2002.
- [31] C. Rose, S. Ulukus, and R. Yates. Wireless systems and interference avoidance. *IEEE Trans. Wireless Commun.*, 1(3):415–428, July 2002. **Marconi Prize Paper Award.**
- [32] A. Yener, R. Yates, and S. Ulukus. CDMA multiuser detection: A nonlinear programming approach. *IEEE Trans. Commun.*, 50(6):1016–1024, June 2002.
- [33] A. Yener, R. Yates, and S. Ulukus. Interference management for CDMA systems through power control, multiuser detection, and beamforming. *IEEE Trans. Commun.*, 49(7):1227–1239, July 2001.
- [34] S. Ulukus and R. Yates. Iterative construction of optimum signature sequence sets in synchronous CDMA systems. *IEEE Trans. Info. Theory*, 47(5):1989–1998, July 2001.
- [35] D. Ramakrishna, N. Mandayam, and R. Yates. Subspace-based SIR estimation for CDMA cellular systems. *Proc. IEEE Vehicular Technology Conf. (VTC)*, 49(5):1732–1742, September 2000.
- [36] O. Kelly, J. Lai, N. Mandayam, J. Panchal, A. Ogielski, and R. Yates. Scalable parallel simulations of wireless networks with WiPPET: Modeling of radio propagation, mobility and protocols. *ACM Mobile Networks and Applications*, 5(3):199–208, 2000.
- [37] M. Saquib, R. Yates, and A. Ganti. An asynchronous multirate decorrelator. *IEEE Trans. Commun.*, 48(5):739–742, May 2000.
- [38] M. Saquib, R. Yates, and A. Ganti. Power control for an asynchronous multirate decorrelator. *IEEE Trans. Commun.*, 48(5):804–812, May 2000.
- [39] R. Yates and N. Mandayam. Challenges in low-cost wireless data transmission. *IEEE Signal Processing Magazine*, 17(3):93–102, May 2000.
- [40] J. Li, R. Yates, and D. Raychaudhuri. Performance analysis of path rerouting algorithms for handoff control in mobile ATM networks. *IEEE J. Sel. Areas Commun.*, 18(3):496–509, March 2000.

- [41] J. Li, R. Yates, and D. Raychaudhuri. Mobile ATM: A generic and flexible network infrastructure for 3G mobile services. *Journal of Communications and Networks*, 2(1), March 2000.
- [42] R. H. Frenkiel, B. R. Badrinath, J. Borras, and R. Yates. The infostations challenge: Balancing cost and ubiquity in delivering wireless data. *IEEE Personal Communications*, 7(2):66–71, April 2000.
- [43] M. Saquib, R. Yates, and N. Mandayam. Decorrelating detectors for a dual rate synchronous DS/CDMA channel. *Wireless Personal Communications*, 9(3):197–216, 1998.
- [44] S. Ulukus and R. Yates. A blind adaptive decorrelating detector for CDMA systems. *IEEE J. Sel. Areas Commun.*, 16(8):1530–1541, 1998.
- [45] S. Ulukus and R. Yates. Adaptive power control and multiuser interference suppression. *ACM Wireless Networks*, 4(6):489–496, 1998.
- [46] M. Saquib, R. Yates, and N. Mandayam. Decision feedback detection for a dual rate CDMA system. *ACM Wireless Networks*, 4(6):497–506, 1998.
- [47] S. Ulukus and R. Yates. Stochastic power control for cellular radio systems. *IEEE Trans. Commun.*, 46(6):784–798, June 1998.
- [48] S. Ulukus and R. Yates. Optimum multiuser detection is tractable for synchronous CDMA systems using M-sequences. *IEEE Communications Letters*, 2(4):89–91, 1998.
- [49] M. Andersin, N. Mandayam, and R. Yates. Subspace-based estimation of the signal-to-interference ratio for TDMA cellular systems. *Baltzer/ACM Wireless Networks*, 4(3):241–247, April 1998.
- [50] C.Y. Huang and R. Yates. Rate of convergence for minimum power assignment algorithms in cellular radio systems. *Baltzer/ACM Wireless Networks*, 4(3):223–231, April 1998.
- [51] J. Panchal, O. Kelly, J. Lai, N. Mandayam, A. Ogielski, and R. Yates. Parallel simulation of wireless networks with TED: Radio propagation, mobility and protocols. *ACM Sigmetrics Performance Evaluation Review*, 25(4):30–39, March 1998.
- [52] S. Grandhi, R. Yates, and D. Goodman. Resource allocation for cellular radio systems. *IEEE Trans. on Vehic. Tech.*, 46(3):581–588, August 1997.
- [53] C. Rose and R. Yates. Ensemble polling strategies for increased paging capacity in mobile communications networks. *Baltzer/ACM Journal of Wireless Networks*, 3(2):159–167, 1997.
- [54] C. Rose and R. Yates. Location uncertainty in mobile networks: a theoretical framework. *IEEE Communications Magazine*, 35(2):94–101, Feb 1997.

- [55] R. Yates, C. Rose, S. Rajagopalan, and B. Badrinath. Analysis of a mobile-assisted adaptive location management strategy. *ACM Mobile Networks and Applications (MONET)*, 1(2):105–112, 1996.
- [56] C. Rose and R. Yates. Genetic Algorithms and Call Admission to Telecommunications Networks. *Computers and Operations Research*, 23(5):485–499, May 1996.
- [57] P. Narasimhan and R. Yates. A new protocol for the integration of voice and data over PRMA. *IEEE J. Sel. Areas Commun.*, 14(4):623–631, May 1996.
- [58] R. Yates. A framework for uplink power control in cellular radio systems. *IEEE J. Sel. Areas Commun.*, 13(7):1341–1347, September 1995.
- [59] S. Grandhi, J. Zander, and R. Yates. Constrained power control. *International Journal of Wireless Personal Communications*, 1(4), 1995.
- [60] R. Yates and C.Y. Huang. Integrated power control and base station assignment. *IEEE Trans. Vehic. Tech.*, 44(3):638–644, August 1995.
- [61] C. Rose and R. Yates. Minimizing the average cost of paging under delay constraints. *ACM Wireless Networks*, 1(2):211–219, 1995.
- [62] C. Rose and R.D. Yates. Scheduling Arrivals to Queues for Minimum Average Blocking: The S(n)/M/C/C system. *Computers and Operations Research*, 22(8):793–806, October 1995.
- [63] R. Yates. Analysis of discrete time queues via the reversed process. *Queueing Systems: Theory and Applications*, 18:107–116, 1994.
- [64] J. Hui, M. Gursoy, N. Moayeri, and R. Yates. A layered broadband switching architecture with physical or virtual path configurations. *IEEE J. Sel. Areas Commun.*, 9(9):1416–1426, 1991.

## Books

- [1] R. D. Yates and D. J. Goodman. *Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers, 3rd Edition*. John Wiley & Sons, 2014. 25% new content.
- [2] G. Kramer, I. Maric, and R. Yates. *Cooperative Communications*. Foundations and Trends in Networking. NOW Publishers, 2007.
- [3] R. D. Yates and D. J. Goodman. *Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers, 2nd Edition*. John Wiley & Sons, 2004. 40% new content.
- [4] R. D. Yates and D. J. Goodman. *Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers*. John Wiley & Sons, 1999.

## Submitted for Publication

- [1] Roy D Yates. The age of information in networks: Moments, distributions, and sampling. *arXiv preprint arXiv:1806.03487*, 2018.

## Research Grants

- (\$500,000) National Science Foundation *CCF: Small: Timely Updating: Principles and Applications* NSF Award 1717041, PI: R. Yates. 8/1/2017-7/31/2020.
- (\$476,045) National Science Foundation *CIF: Small: Status Updating Systems and Networks* NSF Award 1422988, PI: R. Yates. 8/1/2014-7/31/2017.
- (\$2,,899,858) National Science Foundation *FIA-NP: Collaborative Research: The Next-Phase MobilityFirst Project - From Architecture and Protocol Design to Advanced Services and Trial Deployments* NSF Award 1345295, PI: D. Raychaudhuri, Co-PIs: R. Martin, W. Trappe, R. Yates, Y. Zhang. 5/1/2014-4/30/2018.
- (\$2,730,000) National Science Foundation *FIA: Collaborative Research: MobilityFirst: A Robust and Trustworthy Mobility-Centric Architecture for the Future Internet* PI D. Raychaudhuri, co-PIs: M. Gruteser, R. Martin, I. Seskar, W. Trappe, R. Yates, Y. Zhang 9/1/2010-8/31/2014.
- (\$300,000) National Science Foundation *NeTS WN: Rechargeable Networks* PI: R. Yates. 6/1/2010-5/31/2014.
- (\$230,000) Army Research Office *Enhancing the Security of Wireless Systems through Opportunistic Secret Communications*, PI: W. Trappe, co-PI: R. Yates, 2009-2011.
- (\$450,000) National Science Foundation *NeTS WN: A Joule for your Byte: Barter-Exchange Incentive Mechanisms for Wireless Networks*, PI: R. Yates, co-PI: N. Mandayam 9/1/2007-8/31/2010.
- (\$600,000) National Science Foundation *NeTS FIND: Postcards from the Edge: A Cache-and-Forward Architecture for the Future Internet*, PI: R. Yates, co-PIs: S. Paul, D. Raychaudhuri. 9/1/2006-8/31/2009.
- (\$670,000) National Science Foundation, *NeTs Pro-Win: Cognitive Radios for Open Access to Spectrum*, PI: N. Mandayam, co-PIs: C. Rose P. Spasojevic and R.D. Yates.
- (\$676,595) National Science Foundation SPN-0338805, *Collaborative Research:MAMA (Multiple Antennas Multiple Appliances) Wideband Wireless Networks: A Pervasive Technology for the Home and Workplace*. Principal Investigator: R. Yates, Co-Principal Investigators: L. J. Greenstein, P. Spasojevic. 1/1/2004–12/31/2006. (Multi-university collaboration with Princeton and NJIT, \$2.0M total.)

- (\$5,453,115) National Science Foundation CNS-0335244, *ORBIT: Open-Access Research Testbed for Next-Generation Wireless Networks*. Principal Investigator: D. Raychaudhuri, Co-Principal Investigators: R. Yates, W. Trappe, Y. Zhang, M. Parashar, H. Kobayashi (Princeton Univ), H. Schulzrinne (Columbia). 9/1/2003 – 8/31/2007.
- (\$832,553) National Science Foundation CCR-0205362, *ITR: Collaborative Research: Achieving Innovative and Reliable Services in Unlicensed Spectrum*. Principal Investigator: R. Yates, Co-Principal Investigators: C. Rose, N. Mandayam, P. Spasojevic, and D. Raychaudhuri. 1/1/2003 – 12/2005. (Multi-university collaboration with Cornell and Michigan State, \$1.45M total.)
- (\$856,997) National Science Foundation ITR 00-85986 *Free Bits: The Challenge of the Wireless Internet*, Principal Investigator: R. Yates, Co-Principal Investigators: N. Mandayam, C. Rose. 9/1/2000 – 9/1/2003. (Multi-university collaboration with Princeton and NJIT, \$1.8M total.)
- (\$430,000) National Science Foundation CCR 99-73012, *Interference Avoidance in Wireless Systems*, Principal Investigator: C. Rose, Co-Principal Investigator: R. Yates. 9/1/1999 – 9/1/2002.
- (\$90,000) NTT DoCoMo, *Interference Cancellation and Radio Resource Management in Multicell WCDMA Systems*. Principal Investigator: R. Yates, Co-Principal Investigator: N. Mandayam. 11/1/1999 – 11/1/2001.
- (\$1,218,405) New Jersey Commission on Science and Technology, *Digital Radio as an Enabling Technology for Computing, Communications and Information Systems*, PI: R. Yates, co-PIs: C. Rose, N. Mandayam, R. Frenkiel. 1/1/1999-1/1/2004.
- (\$469,898) National Science Foundation NCR 95-06505 *Power Control for Packet Radio Networks*, Principal Investigator: R. Yates, Co-Principal Investigator: C. Rose, 9/1/95 - 9/1/98.
- (\$170,000) National Science Foundation NCR 97-29863 *Parallel Computing for Wireless Networking Research*, PI: D.J. Goodman co-PIs: N. Mandayam, A. Ogielski, C. Rose, R. Yates.
- (\$33,500) Texas Instruments *Subspace-based Approaches for Signal Quality Estimation and Interference Cancellation in Wireless Systems*, PI: N. Mandayam, co-PI R. Yates, 9/1/97–9/1/98.
- (\$20,000) AT&T Foundation, *Autonomous Controller Design using Genetic Algorithms*, C. Rose & R. Yates, 10/95.
- (\$412,456) National Science Foundation (CISE/NCRI) 4-20931, *Searching for Good Call Admission Policies in Telecommunications Networks*, Principal Investigator: C. Rose, Co-Principal Investigator: R. Yates, 9/1/92–9/1/95.



**Conference Publications**

- [1] R.D. Yates, J. Zhong, and W. Zhang. Updates with multiple service classes. In *Proc. IEEE International Symposium Info. Theory*, July 2019.
- [2] Tanya Shreedhar, Sanjit K. Kaul, and Roy D. Yates. An age control transport protocol for delivering fresh updates in the internet-of-things. In *20th IEEE International Symposium on A World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, 2019.
- [3] J. Zhong, W. Zhang, R.D. Yates, A. Garnaev, and Y. Zhang. Age-aware scheduling for asynchronous arriving jobs in edge applications. In *Infocom Workshop on Age of Information*, April 2019.
- [4] A. Garnaev, J. Zhong, W. Zhang, and R.D. Yates. Maintaining information freshness under jamming. In *Infocom Workshop on Age of Information*, April 2019.
- [5] J. Zhong, R. D. Yates, and E. Soljanin. Timely lossless source coding for randomly arriving symbols. In *2018 IEEE Information Theory Workshop (ITW)*, pages 1–5, Nov 2018.
- [6] J. Zhong, R.D. Yates, and E. Soljanin. Multicast with prioritized delivery: How fresh is your data? In *Signal Processing Advance for Wireless Communications (SPAWC)*, pages 476–480, June 2018.
- [7] J. Zhong, R.D. Yates, and E. Soljanin. Two freshness metrics for local cache refresh. In *Proc. IEEE International Symposium Info. Theory*, pages 1924–1928, June 2018.
- [8] R.D. Yates. Status updates through networks of parallel servers. In *Proc. IEEE International Symposium Info. Theory*, pages 2281–2285, June 2018.
- [9] R.D. Yates. Age of information: Updates with priority. In *Proc. IEEE International Symposium Info. Theory*, pages 2644–2648, June 2018.
- [10] J. Zhong, R.D. Yates, and E. Soljanin. Minimizing content staleness in dynamo-style replicated storage systems. In *Infocom Workshop on Age of Information*, April 2018. arXiv preprint arXiv:1804.00742.
- [11] R. D. Yates. Age of information in a network of preemptive servers. In *Infocom Workshop on Age of Information*, April 2018. arXiv preprint arXiv:1803.07993.
- [12] J. Zhong, R.D. Yates, and E. Soljanin. Status updates through multicast networks. In *Proc. Allerton Conf. Communications, Control, and Computing*, pages 463–469, October 2017.
- [13] R.D. Yates, E. Najm, E. Soljanin, and J. Zhong. Timely updates over an erasure channel. In *Proc. IEEE International Symposium Info. Theory*, pages 316–320, June 2017.
- [14] S. K. Kaul and R.D. Yates. Status updates over unreliable multiaccess channels. In *Proc. IEEE International Symposium Info. Theory*, pages 331–335, June 2017.

- [15] R.D. Yates, P. Ciblat, M. Wigger, and A. Yener. Age-optimal constrained cache updating. In *Proc. IEEE International Symposium Info. Theory*, pages 141–145, June 2017.
- [16] J. Zhong, R.D. Yates, and E. Soljanin. Backlog-adaptive compression: Age of information. In *Proc. IEEE International Symposium Info. Theory*, pages 566–570, June 2017.
- [17] E. Najm, R.D. Yates, and E. Soljanin. Status updates through M/G/1/1 queues with HARQ. In *Proc. IEEE International Symposium Info. Theory*, pages 131–135, June 2017.
- [18] R. Yates, M. Tavan, Y. Hu, and D. Raychaudhuri. Timely cloud gaming. In *Proc. IEEE INFOCOM*, May 2017.
- [19] M. Tavan, R. D. Yates, and D. Raychaudhuri. Connected vehicles under information-centric architectures. In *IEEE Vehicular Networking Conference (VNC)*, pages 1–8. IEEE, 2016.
- [20] M. Tavan, R.D. Yates, and D. Raychaudhuri. Connected vehicles under named object architectures. In *Proc. First ACM Int'l Workshop on Smart, Autonomous, and Connected Vehicular Systems and Services*, pages 60–61. ACM, 2016.
- [21] Y. Sun, E. Uysal-Biyikoglu, R. D. Yates, C. E. Koksal, and N. Shroff. Update or wait: How to keep your data fresh. In *Proc. IEEE INFOCOM*, pages 1–9, 2016.
- [22] J. Zhong and R.D. Yates. Timeliness in lossless block coding. In *Data Compression Conference (DCC)*, pages 339–348, March 2016.
- [23] Z. Chen, R.D. Yates, and D. Raychaudhuri. Dynamic node-disjoint multipath routing for millimeter wave networks using directional antennas. In *Proc. Conf. Information Sciences and Systems (CISS)*, pages 430–435, March 2016.
- [24] R.D. Yates and S. Kaul. Real time status: When should you update? In *Proc. 17th Yale Workshop on Adaptive and Learning Systems*, July 2015.
- [25] R.D. Yates. Lazy is timely: Status updates by an energy harvesting source. In *Information Theory (ISIT), 2015 IEEE International Symposium on*, pages 3008–3012. IEEE, 2015.
- [26] H. Mahdavi-Doost and R.D. Yates. Hybrid ARQ in block-fading channels with an energy harvesting receiver. In *Information Theory (ISIT), 2015 IEEE International Symposium on*, pages 1144–1148. IEEE, 2015.
- [27] F. Zhang, C. Xu, Y. Zhang, KK Ramakrishnan, S. Mukherjee, R.D. Yates, and T. Nguyen. Edgebuffer: Caching and prefetching content at the edge in the mobilityfirst future internet architecture. In *World of Wireless, Mobile and Multimedia Networks (WoWMoM), 2015 IEEE 16th International Symposium on a*, pages 1–9. IEEE, 2015.

- [28] H. Mahdavi-Doost and R.D. Yates. Opportunistic reception in a multiuser slow-fading channel with an energy harvesting receiver. In *Communications (ICC), 2015 IEEE International Conference on*, pages 104–109. IEEE, 2015.
- [29] M. Tavan, R.D. Yates, and W.U. Bajwa. Information in tweets: Analysis of a bufferless timing channel model. In *Proc. IEEE International Symposium Info. Theory*, July 2014.
- [30] M. Tavan, R.D. Yates, and W.U. Bajwa. Capacity analysis of a discrete-time bufferless timing channel. In *Proc. Conf. Information Sciences and Systems (CISS)*, March 2014.
- [31] H. Mahdavi-Doost and R.D. Yates. Fading channels in energy-harvesting receivers. In *Proc. Conf. Information Sciences and Systems (CISS)*, pages 1–6, March 2014.
- [32] R.D. Yates and H. Mahdavi-Doost. Energy harvesting receivers: Optimal sampling and decoding policies. In *Signal and Information Processing (GlobalSIP), IEEE Global Conference on*, December 2013.
- [33] M. Tavan, R.D. Yates, and W.U. Bajwa. Bits through bufferless queues. In *Proc. Allerton Conf. Communications, Control, and Computing*, October 2013.
- [34] Z. Chen, R. D. Yates, and D. Raychaudhuri. EDMAC: An enhanced directional medium access control protocol for 60 ghz networks. In *Personal Indoor and Mobile Radio Communications (PIMRC), 2013 IEEE 24th International Symposium on*, pages 1726–1730, 2013.
- [35] H. Mahdavi-Doost and R.D. Yates. Energy harvesting receivers: Finite battery capacity. In *Proc. IEEE International Symposium Info. Theory*, pages 1799–1803, 2013.
- [36] N. Krishnan, R.D. Yates, and N.B. Mandayam. Cellular systems with many antennas: Large system analysis under pilot contamination. In *Communication, Control, and Computing (Allerton), 2012 50th Annual Allerton Conference on*, pages 1220–1224, Oct 2012.
- [37] R.D. Yates and W. Lehr. MobilityFirst, LTE and the evolution of mobile networks. In *Dynamic Spectrum Access Networks (DySPAN), 2012 IEEE International Symposium on*, pages 180–188, September 2012.
- [38] R. Yates and S. Kaul. Real-time status updating: Multiple sources. In *Proc. IEEE International Symposium Info. Theory*, July 2012.
- [39] S. Kaul, R. Yates, and M. Gruteser. Real-time status: How often should one update? In *Proc. IEEE INFOCOM*, pages 2731–2735, April 2012.
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- [165] P. Narasimhan and R. Yates. Performance analysis of frame reservation multiple access. In *Third International Conference Universal Personal Communications ICUPC'94*, pages 26–30, 1994. San Diego, CA.
- [166] R. Yates and C. Rose. Scheduling arrivals at a single server for min-max blocking. In *Proc. Conf. Information Sciences and Systems (CISS)*, pages 1047–1050, March 1994. Princeton, NJ.

### Invited Talks

- [1] The age of information in networks: Moments, distributions, and sampling. IStEC Distinguished Lecture Series, Colorado State University. Fort Collins CO, Sep. 2019.
- [2] Age of information: status updates for real-time systems. IMACCS Workshop, The Ohio State University. Columbus OH, June 2018.
- [3] The age of information: Applications, metrics, and analytical methods. Electrical & Computer Engineering Distinguished Colloquium, University of Maryland. College Park MD, Feb. 2018.
- [4] The age of information: Status updates for real-time communication systems and networks. Riunione Annuale GTTI-SIEM-CNIT. Udine, Italy, June 2017.

- [5] The age of information: Timeliness metrics and optimal status updating policies. Dept. of Computer and Information Sciences Fall Colloquium Series. Philadelphia PA, Dec. 2016.
- [6] Real-time status: How should you update? Telecom ParisTech Seminar. Paris France, June 2016.
- [7] Energy harvesting receivers. Plenary, Energy Harvesting and Green Wireless Communications Symposium. 2013 IEEE Global Conference on Signal and Information Processing.
- [8] Real-time status: How often should one update? Networked Systems Seminar. UC Irvine, Feb. 2013.
- [9] Networks and communications for energy-efficient living. Workshop on Green Communications. Institute for Systems Research, University of Maryland. October, 2010.
- [10] The WINLAB Workshops: A twenty year perspective on research. Workshop in Honor of David J. Goodman. October, 2009.
- [11] Data dissemination and storage over location-unaware wireless sensor networks. Fifth Workshop on Spatial Stochastic Models for Wireless Networks (SpaSWiN). June 2009, Seoul Korea.
- [12] R. Yates. Fading broadcast channels with channel state known only at the receivers, September 2008. University of Maryland Colloquium.
- [13] R. Yates. Dynamic spectrum allocation for uplink users with heterogeneous utilities, Nov 2007. Stanford University.
- [14] R. Yates. Dynamic spectrum sharing for cognitive radios, August 2007. E&CE Dept., University of Colorado at Boulder.
- [15] R. Yates. Cognitive radio research at winlab, February 2006. Qualcomm, La Jolla, CA.
- [16] R. Yates. Cooperative transmission for wireless sensor networks, Apr 2005. Intel, Hillsboro OR.
- [17] R. Yates. Cooperative strategies in two-hop gaussian relay networks, Jan 2005. LIDS Student Days Conference, EECS Dept., MIT, Cambridge MA.
- [18] R. Yates. Cooperative multicast for wireless networks, Sept. 2004. Dept. of Elec. Eng., Princeton University, Princeton NJ.
- [19] R. Yates. Cooperative broadcast algorithms for wireless networks, April 2004. Center for Satellite and Hybrid Communication Networks, Univ. of Maryland, College Park MD.

- [20] R. Yates. Performance of repetition codes and punctured codes for accumulative broadcast, March 2003. WiOPT'03: Modeling and Optimization in Mobile and Ad Hoc and Wireless Networks. Sophia-Antipolis, France.
- [21] R. Yates. Service outage based resource allocation for wireless systems, February 2002. ECE Dept, Univ. of Massachusetts, Amherst.
- [22] R. Yates. Free bits, June 2001. KTH Wireless Center, Kista, Sweden.
- [23] R. Yates. Free Bits: The Challenge of the Wireless Internet, May 2001. Wireless World Research Forum Second Meeting, Nokia Research Center, Helsinki, Finland.
- [24] R. Yates. Service outage based resource allocation for wireless systems, April 2001. Dept. of Electrical Engineering, University of Texas at Dallas.
- [25] R. Yates. Multi-cell WCDMA signal processing simulation testbed, April 2001. Nokia Research Center, Dallas TX.
- [26] R. Yates. Distributed interference management for wireless systems, December 2000. Dept. of Electrical Engineering, Columbia University.
- [27] R. Yates. Interference management for CDMA wireless systems, November 2000. Dept. of Electrical Engineering, Polytechnic University.
- [28] R. Yates. Trends in wireless data, August 2000. DIMACS Summer School on Foundations of Wireless Networks and Applications.
- [29] A. Yener and R. Yates. Decorrelating acquisition and access for connectionless CDMA. In *Symposium on Interference Rejection and Signal Separation in Wireless Communications IRSS00*, April 2000. (invited).
- [30] R. Yates. "Free Bits" Over the Air: The Challenge of the Wireless Internet, March 2000. Sprint Research Symposium, Univ. of Kansas, Lawrence KS.
- [31] R. Yates. Interference suppression and avoidance for wireless systems, May 1999. Institute for Systems Research, Univ. of Maryland, College Park MD.
- [32] R. Yates. Power control, interference suppression and interference avoidance for wireless systems, May 1999. Radio Communications Laboratory, Royal Institute of Technology, Stockholm Sweden.
- [33] R. Yates. Fourth generation wireless data, May 1999. Radio Communications Laboratory, Royal Institute of Technology, Stockholm Sweden.
- [34] R. Yates. Adaptive resource allocation, May 1999. Communication Theory Workshop.
- [35] R. Yates. Power control, interference suppression and interference avoidance for CDMA systems, February 1999. Dept. of Elec. Eng., Princeton University, Princeton NJ.

- [36] R. Yates. Radio resource management, October 1998. NSF/ONR Workshop on Future Directions in Systems and Control Research in Communication Networks, Airlie House, VA.
- [37] R. Yates. Combined power control and interference suppression for CDMA systems, April 1998. ECE Dept., New Jersey Institute of Technology.
- [38] R. Yates. Coverage and capacity of an infostations system, May 1997. Fourth INFORMS Telecommunications Conference, Boca Raton FL.
- [39] R. Yates. Power control and multiuser detection, July 1997. Applied Probability Conference, Boston MA.
- [40] R. Yates. Power control using available measurements for cellular radio systems, October 1996. Bellcore, Red Bank, NJ.
- [41] R. Yates. Stochastic power control for cellular radio systems, September 1996. Institute for Systems Research, Univ. of Maryland, College Park MD.
- [42] R. Yates. Stochastic power control for CDMA cellular radio systems, September 1996. Ericsson Radio, Research Triangle Park NC.
- [43] R. Yates. Uplink power control for CDMA cellular radio systems, April 1995. NEC C&C Research Laboratories, Princeton NJ.
- [44] R. Yates. A unified approach to power control in cellular radio systems, March 1995. Third INFORMS Telecommunications Conference, Boca Raton FL.
- [45] R. Yates. Blind packet scheduling for min-max blocking, April 1995. RUTCOR Stochastic Optimization Seminar.
- [46] R. Yates. Issues in the 902-928 mhz unlicensed band, March 1995. Electric Power Research Institute, Pittsburgh PA.
- [47] R. Yates. A framework for power control in cellular radio systems, Sep 1994. UCLA EE Dept., Los Angeles, CA.
- [48] R. Yates. Uplink power control in cellular radio systems, May 1994. MIT Laboratory for Information and Decision Systems, Cambridge MA.
- [49] R. Yates. Integrated power control and base station assignment, Feb 1994. AT&T Bell Laboratories, Holmdel NJ.

#### **Ph.D. Students Supervised**

- [1] Jing Zhong. *Age of Information for Real-Time Network Applications*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, October 2019. Joint supervision with E. Soljanin. Employment: Research Scientist, Facebook.



- [2] Mehrnaz Tavan. *Design and Implementation of Real-Time Cloud-Assisted Systems*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, October 2017. Joint supervision with D. Raychaudhuri. Employment: Data Scientist, Ebay.
- [3] Hajar Mahdavi-Doost. *Energy-Aware Reliable Communication*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, June 2016.
- [4] Zhuo Chen. *60 GHz MAC and Network Design*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, December 2015. Joint supervision with D. Raychaudhuri. Employment: Interdigital, King of Prussia PA.
- [5] Narayanan Krishnan. *Coverage and Capacity of Next Generation Cellular Radio Systems: Bandwidth Sharing and Massive MIMO*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, October 2013. Joint supervision with N. Mandayam. Employment: Senior Engineer, Qualcomm, San Diego CA.
- [6] Jignesh Panchal. *Inter-Operator Resource Sharing in 4G LTE Cellular Networks*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, October 2011. Employment: Alcatel-Lucent, Murray Hill NJ.
- [7] Jing Lei. *Optimization Techniques for Configuration of Advanced Wireless Networks*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, January 2011. Joint supervision with L. Greenstein. Employment: Qualcomm, San Diego CA.
- [8] Chandrasekharan Raman. *Relaying and Scheduling in Interference Limited Wireless Networks*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, April 2010. Joint supervision with N. Mandayam and G. J. Foschini. Employment: MTS, Alcatel-Lucent, Murray Hill NJ.
- [9] Zang Li. *Opportunistic Secret Communication in Wireless Systems*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, May 2009. Joint supervision with W. Trappe. Employment: MTS, Juniper Networks.
- [10] Joydeep Acharya. *Utility and Profit Maximization in Dynamic Spectrum Allocation*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, May 2009. Employment: MTS, Hitachi Labs.
- [11] Silvija Kokalj-Filipovic. *Infrastructures for Data Dissemination and In-Network Storage in Location-Unaware Wireless Sensor Networks*. PhD thesis, Rutgers University Dept. of Electrical and Computer Engineering, Nov 2008. Joint supervision with P. Spasojevic. Employment: Postdoc, INRIA.
- [12] Mehmet Kemal Karakayali. *Network Coordination for Spectrally Efficient Communications in Wireless Networks*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, January 2007. Employment: MTS, Alcatel-Lucent Bell Labs.

- [13] Ivana Maric. *Cooperative Strategies for Wireless Relay Networks*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, Oct 2006. Employment: Postdoc, Stanford University.
- [14] Jianghong Luo. *Service Outage Based Adaptive Transmission in Fading Channels*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, June 2004. Joint supervision with P. Spasojevic. Employment: Postdoc, Princeton University.
- [15] Wing-Ho Yuen. *Modeling and Analysis of Mobile Ad Hoc Networks*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, June 2004. Employment: Panasonic Technologies, Princeton NJ.
- [16] Lang Lin. *Adaptive Transmission in Fading Environments*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, January 2004. Joint supervision with P. Spasojevic. Employment: Globespan-Virata, Red Bank NJ.
- [17] Rajnish Sinha. *Noncoherent Multicarrier Communications and Multiuser Detection*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, October 2003. Employment: Lucent Technologies, Whippany NJ.
- [18] Aylin Yener. *Efficient Access and Interference Management for CDMA Wireless Systems*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, May 2000. Employment: Assistant Professor, Penn State Univ., State College PA.
- [19] Joan Borrás. *Capacity of an Infostation System*. PhD thesis, Rutgers University, Dept. of Electrical and Computer Engineering, January 2000. Employment: Tempos 21, Innovacion en Aplicaciones Moviles, S.A., Barcelona Spain.
- [20] Jun Li. *Protocol Design and Performance Analysis for Handoff Control in Mobile ATM Networks*. PhD thesis, Rutgers University Dept. of Electrical and Computer Engineering, August 1999. Employment: Thomson Multimedia, Princeton NJ.
- [21] Sennur Ulukus. *Power Control, Multiuser Detection and Interference Avoidance in CDMA Systems*. PhD thesis, Rutgers University Dept. of Electrical and Computer Engineering, 1998. Employment: Assistant Professor, Univ. of Maryland, College Park.
- [22] Mohammad Saquib. *Quality of Service for Multi-rate DS/CDMA Systems with Multi-user Detection*. PhD thesis, Rutgers University Dept. of Electrical and Computer Engineering, 1998. Employment: Assistant Professor, Univ. of Texas at Dallas.
- [23] Partha Narasimhan. *Quality-of-Service Based Bandwidth Allocation in Integrated Multiservices Wireless Networks*. PhD thesis, Rutgers University, May 1998. Employment: Aruba Networks, San Jose CA.

- [24] Ching-Yao Huang. *Radio Resource Management in Power Controlled CDMA Systems*. PhD thesis, Rutgers University, May 1996. Employment: Assistant Professor, Department of Electronics Engineering, National Chiao Tung University, Taiwan.

### **M.S. Students Supervised**

- [1] Umut Akyol. Effects of physical layer models on wireless network simulations. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, May 2005.
- [2] Joydeep Acharya. Two dimensional spreading for doubly dispersive channels. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, May 2005.
- [3] Kinjal Desai. Tournament arena simulation for a wireless ecosystem in unlicensed band. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, Jan 2005.
- [4] M. Kemal Karakayali. Resource management for downlink wireless systems. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, October 2003.
- [5] Nanyan Jiang. Wireless broadcast services. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, June 2002.
- [6] Vikram Kaul. Multicell WCDMA signal processing simulation testbed. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, November 2000.
- [7] Ivana Maric. Connection establishment in the bluetooth system. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, October 2000.
- [8] Shaline Kishore. Scheduling multirate CDMA users based on average power consumption. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, December 1998.
- [9] David Pandian. Channel allocation and power control in IS-136. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, January 1999.
- [10] Jignesh Panchal. Parallel simulator of wireless networks. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, December 1998.
- [11] Sorabh Gupta. Soft dropping power control. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, 1997.
- [12] Deepa Ramakrishna. Subspace based estimation of the signal to interference ratio for CDMA cellular systems. Master's thesis, Rutgers University Dept. of Electrical and Computer Engineering, 1997. Joint supervision with N. Mandayam.

- [13] Rajnish Sinha. Spread spectrum interference issues in the unlicensed band. Master's thesis, Rutgers University, 1996.
- [14] Siva Veerepalli. Dual rate multiple access: A radio access protocol. Master's thesis, Rutgers University, May 1996.
- [15] Kevin G. Chen. Integrated dynamic resource management of wireless communication systems. Master's thesis, Rutgers University, January 1996.
- [16] Asokan Sethu. A model for wireless multimedia access protocols. Master's thesis, Rutgers University, Sept. 1995.
- [17] M. Saquib. Optimal call admission to a mobile cellular network. Master's thesis, Rutgers University, 1995.

## Teaching

### **Instructor: 14:332:222 Principles of Electrical Engineering II**

**Semesters Taught** Spring 1997-2000

**Average Course Enrollment** 90 undergraduates

**Description** Circuit analysis, network theorems, controlled sources, nonlinear elements, transient analysis. Laplace transforms, step and impulse response, and computer methods.

### **Instructor: 14:332:226 (formerly 14:332:321, 14:332:349) Probability and Random Processes**

**Semesters Taught** Fall 1991-1992, Fall 1995, Fall 2002-2004, Spring 2009-2016, Spring 2019

**Average Course Enrollment** 120 (1991-95), 200 (2002-04), 180 (2009-13) 230 (2014-16, 2019) undergraduates

**Description** Probability and its axioms, conditional probability, independence, random variables and distributions, functions of random variables, expectations, random vectors, law of large numbers, central limit theorem. Characterization of random processes, linear systems with random process inputs, spectral density.

### **Instructor: 14:332:322 (formerly 14:332:450) Principles of Communications Systems**

**Semesters Taught** Fall 1990, Spring 1993-99, Spring 2007

**Average Course Enrollment** 100 undergraduates

**Description** Principles of analog communications systems, correlation functions, power spectral density, effects of noise on system performance. Analysis of analog modulation techniques including AM, DSB-SC, VSB, SSB, FM, PM.

### **Instructor: 14:332:421 Communications Engineering**

**Semesters Taught** Spring 1991, Spring 1992, Fall 2000

**Average Course Enrollment** 40 undergraduates

**Description** Theoretical and practical aspects of digital data transmission in the presence of noise. Effects of finite bandwidth, error rate analysis for various modulation strategies. Source and channel coding.

**Instructor: 16:332:541 Stochastic Signals and Systems**

**Semesters Taught** Fall 1995–98, Fall 2004–2006, Fall 2008–2011, 2014

**Average Course Enrollment** 35–45 graduate students

**Description** Probability, random variables, response of memoryless channels to random inputs, sequences of random variables, central limit theorem, stochastic processes, linear dynamic systems with stochastic inputs, correlation and power spectral density.

**Instructor: 16:332:542 Information Theory**

**Semesters Taught** Spring 2003, Spring 2005, Spring 2007, Spring 2009, Spring 2017

**Average Course Enrollment** 10 graduate students

**Description** Noiseless channels and channel capacity; entropy, mutual information, Kullback-Leibler distance and other measures of information; typical sequences, asymptotic equipartition theorem; prefix codes, block codes, data compression, optimal codes, Huffman, Shannon-Fano-Elias, Arithmetic coding; memoryless channel capacity, coding theorem and converse; Hamming, BCH, cyclic codes; Gaussian channels and capacity; networks

**Instructor: 16:332:543 Communication Networks I**

**Semesters Taught** Fall 1998, Fall 2005, Fall 2016

**Average Course Enrollment** 45 graduate students (2016)

**Description** Introduction to telephony and packet data networks. Circuit and packet switching networks. Multiple access networks. Delay and blocking analysis. Queueing network analysis.

**Instructor: 16:332:546 Wireless Communication Technologies**

**Semesters Taught** Spring 2004, Spring 2018

**Average Course Enrollment** 15 graduate students

**Description** Propagation models and modulation techniques for wireless systems, receivers for optimum detection on wireless channels, effects of multiple access and intersymbol interference, channel estimation, diversity methods, radio resource management.

**Instructor: 16:332:559 Advanced Topics in Communication: Discrete Event Stochastic Processes**

**Semesters Taught** Spring 1992, Spring 1993, Fall 1993, Fall 1994, Fall 2015

**Average Course Enrollment** 7 graduate students

**Description** Stochastic point processes with applications to communications and networks. Renewal processes. Poisson process. Discrete and continuous time Markov chains. Semi-Markov processes. Time reversibility. Networks of queues.

**Supervisor: 14:332:418 ECE Senior Capstone**

- Harsh Agarwal, Alex Loh, Ivan Fung, William Cheng. *Adaptive Cruise Control*. Spring 2015.
- Shu Xu *Automated Portfolio Optimization for Small to Mid Sized Investors*, Spring 2015. (Joint project with Jonathan Ksiezopolski)

**Supervisor: 14:332:491-492 Undergraduate Special Problems**

- Jonathan Ksiezopolski. *Automated Portfolio Optimization for Small to Mid Sized Investors*, Spring 2015. (Joint project with Shu Xu.)
- Daniel Bordak, Erin Corrado, Revan Sopher, Ashley Weaver. Team Project: *Programatically Predicting [Bus] Occupancy*, Spring 2014.
- Tae-Min Kim, Nikhil Shenoy, Felix Yeung, Shu Xu, Team Project: *WINDRONE: Gesture-Controlled Flight of an AR Drone*, Spring 2014.
- Peter Lin, Geoffrey Oh, Michael Simio, Stephen Shanko, Team project: *ICEMAN: Intelligent Circuit Equipped Mobile Autonomous Network*, Spring 2012.
- Madhumitha Harishankar, *winride: a carpooling application*, Spring 2012.
- Craig Gutterman, *Cognitive Radio Communication System Design*, Fall 2011, Spring 2012 (Slade Scholar)
- Jordan Romvary, *A Study of the Hidden Terminal Problem using Reinforcement Learning*, Spring 2012.
- Richard Romanowski, *Exploring Cloud-Based Video Conferencing with Augmented Reality*, Spring 2011.
- Brian Goodacre, *Unlocking and Exploring the Emotiv EPOC*, Spring 2011.
- Shanmukha Kotikalapudi, *The Microsoft Kinect Sensor*, Spring 2011
- William Pan, *Programming the WinlabEEG Brain Computer Interface*, Spring 2011
- Christopher Jelesnianski, *A Natural User Interface using the Kinect Sensor*, Spring 2011
- R. Ravindran, *JAVA simulation viewer*, Fall 1998.
- A. Ganti, *Asynchronous Multirate Decorrelators For DS/CDMA Systems*, Fall 1996–Spring 1997. (ECE Department James Leroy Potter Award for original independent investigation by an undergraduate)
- M. Limotte, *A Visual Interface for a Mobile Cellular Simulation*, Spring 1995.
- G. Labrozzi, *Distributed Algorithms in Communication Networks*, Fall 1994.
- C.N. Chuah, *Dynamic Resource Management in Linear Cellular Systems*, Fall 1994. (ECE Department James Leroy Potter Award for original independent investigation by an undergraduate)

- R. Sinha, *Cellular Standards: A Competitive Assessment*, Fall 1993. (Slade Scholar)
- S. Ghanekar, *Satellite Communication System Design*, Fall 1992.
- L. Humphrey, *Signal Triggers in Cellular Systems*, Spring 1992.
- G. Levy, *Study of Telecommunication Networks*, Fall 1991.
- D. Chan, *Head of Line and Output Blocking*, Fall 1991.
- T. Tank, *Winning at Monopoly, the Markov Process*, Fall 1991.
- N. Bery, *Electromagnetic Waves*, Spring 1991.
- M. Esserman, *Optical Disk Technology*, Spring 1991.

### Professional Activities

IEEE Information Theory Society Fellows Committee 2015-2017

Associate Editor:

- *IEEE Transactions on Information Theory* 2009-2013
- *IEEE Journal on Selected Areas in Communications, Series in Wireless*. 1998-2001

Advisory Council Member, Princeton University Department of Computer Science, 2012-2015.

Guest Editor, IEEE Journal on Selected Areas in Communications, Special Issue on Delay and Disruption Tolerant Wireless Communications, May 2007.

External Faculty Opponent: Ph.D. thesis defense of Carl-Gustav Lof, Royal Institute of Technology, Stockholm Sweden.

Ph.D. External Examiner:

- Elie Najm, *Bits through Time*, EPFL, February 2019.
- Igor Stanojev, *Collaborative Retransmission Protocols in Fading Channels: Issues, Solutions and Applications*, New Jersey Institute of Technology, January 2010.
- Thayaparan Thanabalisingham *Resource Allocation in OFDM Cellular Networks*, Department of Electrical and Electronic Eng., University of Melbourne, 2007.
- Anh Tuan Hoang, *Cross-layer Scheduling and Transmission Strategies for Energy-constrained Wireless Networks*, National University of Singapore, 2006.
- Jordi Diaz, *Impact of Channel State Information on Wireless Communications: Outage Capacity, Adaptive Transmission, and Multiuser Diversity*, New Jersey Institute of Technology, April 2006.
- Christian Ibars Casas, *Capacity, Coding, and Interference Cancellation in Multiuser Multicarrier Wireless Communications Systems*, New Jersey Institute of Technology, August 2003.

- Jinwen Ma, *Multiuser Detection for Multirate DS/CDMA Systems*, New Jersey Institute of Technology, November 1999.
- Zohar Naor, *Mobile Users Tracking in Wireless Networks*, Tel Aviv University, April 2000.

Technical Program Committee Member:

Mobicom 1997, 1998; Infocom 1998, 1999, 2005-2007; VTC 2003; Asilomar 2007; Mobihoc 2003, 2007, 2015-17; ICN 2015; ICC 2004, 2012; ICC Comm. Theory 2014, 2017-19; ISIT 2012, 2016-19.

NSF Panelist:

CNS 2018; CIF 2018; AiTF 2017; ECCS/CCSS 2016; CIF 2016; CPS 2016; WiFiUS 2014; CISE NeTS 2010, 2007, 2006; CNS/MRI 2009; CISE/CCF TF 2005, 2009; CISE CRI 2005, STC Site Evaluator, CENS-UCLA, 2004; CISE ITR 2001, 2003; CISE Special Projects in Networking 1999; CISE Networking Research, 1999; CCR 1999; CISE/NCRI Career 1996.

Journal Reviewer:

IEEE Transactions on Information Theory, IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Journal on Selected Areas in Communications, IEEE/ACM Transactions on Networking, IEEE Communication Letters, IEEE Transactions on Mobile Computing, IEEE Transactions on Automatic Control

**University Activities**

Chair, ECE Faculty Search Committee, 2017-2019.

Member, School of Engineering Compensation Review Committee, 2017.

ECE Faculty Compensation Program (FCP) committee, (Chair 2016), (member 2017)

Chair, ECE Distinguished Professor Promotions Committee, 2015-2016.

Member, ECE PhD Qualifier Committee

Chair, ECE PhD Student Mentoring Committee 2011-2014.

Member, ECE Faculty Search Committee, 2010-2014.

School of Engineering Dean's Committee on Appointments and Promotions, 2002–2003, 2003–2004.

Rutgers Article X Grievance Hearing Committee Member

ECE Academic Advisor to incoming sophomores. (1993–1999)

ECE Graduate Scholastic Standing Committee.

ECE Undergraduate Scholastic Standing Committee



University Hearing Board. (1994–1997)

Commencement Marshal. (1992–1996, 2010, 2016)