

**School of Electrical and Computer Engineering
Purdue University**

(1/11/2019)

Name: Chih-Chun Wang

Education:

BSEE	June 1999	National Taiwan University, Taiwan
MSEE	May 2002	Princeton University, USA
PhD	Aug. 2005	Princeton University, USA

Professional and Honorary Society Memberships:

Institute of Electrical and Electronics Engineering (IEEE)
Student Member 2002 – 2004
Member 2006 – 2014
Senior Member 2015 – present
Information Theory Society

Advisor of IEEE Student Chapter at Purdue. (2011-2013)

Honors and Awards:

- [1] President's Awards, National Taiwan University, 1995 - 1999
- [2] B.E. with Highest Honors, National Taiwan University, 1999
- [3] Francis Upton Fellowship, Princeton University, 2000 - 2004
- [4] Wallace Memorial Fellowship, Princeton University, 2004 – 2005
- [5] National Science Foundation Faculty Early Career Development (CAREER) Award, 2009.
- [6] Ruth and Joel Spira Teaching Award, School of Electrical and Computer Engineering, Purdue University, 2011.
- [7] The Motorola Award for Excellence in Teaching, School of Electrical and Computer Engineering, Purdue University, 2012.

Professional Experience

Nov. 1999 – June 2000	Development Engineer, COMTREND Corporation, Taiwan
Sep. 2001 – Aug. 2005	Graduate Research Assistant, Department of Electrical Engineering, Princeton University
June 2004 – July 2004	Engineering Intern, Flarion Technologies, Research Division, Bedminster, NJ
Oct. 2005 – Dec. 2005	Postdoctoral Researcher, Department of Electrical Engineering, Princeton University
Jan. 2006 – July 2012	Assistant Professor, School of Electrical and Computer Engineering, Purdue University
August 2012 – July 2017	Associate Professor, School of Electrical and Computer Engineering, Purdue University
August 2017 – present	Professor, School of Electrical and Computer Engineering, Purdue University

Consulting Activities

Zenith Electronics 2/15/2012 to 6/14/2012

Research Grants and Contracts Received

- [1] Principal Investigator, PRF XR Research Grants “Throughput Enhancement of Multi-Antenna Cellular Systems via Efficient Interference Cancellation,” COEUS number: 07127683 June 2007 – May 2008, \$15,712 (Prof. Wang responsible for \$15,712).
- [2] Principal Investigator, PRF XR Research Grants “Throughput Enhancement of Multi-Antenna Cellular Systems via Efficient Interference Cancellation,” COEUS number: 08126798 June 2008 – May 2009, \$16,375 (Prof. Wang responsible for \$16,375).
- [3] Principal Investigator, NSF, "CAREER: Next Generation Network Coding: Distributed Design Via Coded Feedback," Contract No. CCF-0845968, March 1, 2009 – February 28, 2014, \$397,192. (Prof. Wang responsible for \$397,192.)
- [4] Co-principal Investigator (with Prof. James Krogmeier, PI), Purdue University Provost’s Program for Instructional Innovation, "Instructional Infrastructure for the Vertically Integrated Projects Program," March 1, 2009 – August 31 2012, \$67,310. (Prof. Wang responsible for \$0.)

- [5] Senior Personnel (with Prof. James Krogmeier, PI), NSF, “Collaborative Research: The VIP Program – Integrating Undergraduate Design Projects and Graduate Research,” Contract No. DUE-0837280, May 01, 2009 – April 30, 2011, \$82,732. (Prof. Wang responsible for \$0.)
- [6] Principal Investigator (with Prof. Y.C. Hu as Co-PI), NSF, “NeTS: Medium: Collaborative Research: Unifying Network Coding and Cross-Layer Optimization for Wireless Mesh Networks: From Theory to Distributed Algorithms to Implementation,” Contract No. CNS-0905331, September 01, 2009 – August 31, 2013, \$549,899. (Prof. Wang responsible for \$224,950.)
- [7] Co-principal Investigator (with Prof. James Krogmeier, PI), Aruba Networks, “Voluntary Support for a Vertically Integrated Projects Team Researching Frequency Based Modulation Classification,” November 1, 2010 - October 31, 2011, Voluntary Support, \$10,000 (equipment), \$32,585 (cash). (Prof. Wang responsible for \$3000.)
- [8] Co-principal Investigator (with Prof. Husheng Li, PI (@University of Tennessee, Knoxville), NSF, “ECCS: Collaborative Research: Physical Dynamics Aware Coding for Communications in Cyber Physical Systems: Analysis, Algorithms, and Implementation,” Contract No. ECCS-1407603, September 1, 2014 - August 31, 2017, \$400,000. (Prof. Wang responsible for \$200,000.)
- [9] Principal Investigator, NSF, "CIF: Small: Network Information Theory Meets Network Optimization: Optimal Linear Network Coding for Packet Erasure Networks," Contract No. CCF-1422997, November 1, 2014 – October 31, 2017, \$493,142. (Prof. Wang responsible for \$493,142.)
- [10] Principal Investigator, NSF, "CIF: Small: Perishable Network Information Flow," Contract No. CCF-1618475, July 1, 2016 – June 30, 2019, \$499,708. (Prof. Wang responsible for \$249,854.)
- [11] Co-principal Investigator, NSF, "CIF: Small: Transcoding: A New Approach For Multi-hop Communications," Contract No. CCF-1816013, October 1, 2018 – September 30, 2021, \$499,993. (Prof. Wang responsible for \$233,537.)

Professional Society Activities

Organization: Society of Communications and Networking in China
 Activity: Technical Program Committee, Third International Conference on Communications and Networking in China (ChinaCom), August 2008.

Organization: Society of Communications and Networking in China
 Activity: Technical Program Committee, Fourth International Conference on Communications and Networking in China (ChinaCom), August 2009.

Organization: IEEE Communication Society
 Activity: Technical Program Committee, Second IEEE International Workshop on Wireless Network Coding (WiNC), June 2009.

Organization: IEEE Communication Society
 Activity: Chairing a technical session of *IEEE 28th Conference on Computer Communications (INFOCOM)* mini-conference, Rio de Janeiro, Brazil, April 19 – 25, 2009.

Organization: Society of Information Theory and its Applications; and IEEE Information Theory Society
 Activity: Technical Program Committee, 2010 International Symposium on Information Theory and Its Applications (ISITA), October 2010.

Organization: International Advisory Council (IAC)
 Activity: Technical Program Committee, The 22nd International Teletraffic Congress (ITC), September 2010.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
 Activity: Technical Program Committee, The 8th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), June 2010

Organization: IEEE Communication Society
 Activity: Technical Program Committee, *IEEE 30th Conference on Computer Communications (INFOCOM)*, Shanghai, China, April 10 – 15, 2011.

Organization: IEEE Information Theory Society
 Activity: Chairing a technical session of *IEEE International Symposium on Information Theory (ISIT)*, Saint Petersburg, Russia, July 31 - August 5, 2011.

Organization: International Advisory Council (IAC)
Activity: Technical Program Committee, The 23rd International Teletraffic Congress (ITC), September 2011.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
Activity: Technical Program Committee, The 9th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), May 2011.

Organization: IEEE Communication Society
Activity: Technical Program Committee, IEEE *31st Conference on Computer Communications* (INFOCOM), Orlando, Florida USA, March 25 – 30, 2012.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
Activity: Technical Program Committee, The 10th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Paderbone, Germany, May 2012.

Organization: IEEE Information Theory Society
Activity: Technical Program Committee, The 2012 International Symposium on Network Coding (NetCod), Cambridge, USA, June 2012.

Organization: IEEE Information Theory Society
Activity: Finance Officer, The 2012 North American School of Information Theory, Ithaca, USA, June 2012.

Organization: IEEE Communication Society
Activity: Technical Program Committee, IEEE *32nd Conference on Computer Communications* (INFOCOM), Turin, Italy, April 14 – 19, 2013.

Organization: IEEE Communications Society
Activity: Technical Program Committee, IEEE Wireless Communications and Networking Conference (WCNC), Shanghai, China, April 2013.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
Activity: Technical Program Committee, The 11th International Symposium on Modeling and Optimization in Mobile,

Ad Hoc, and Wireless Networks (WiOpt), Tsukuba Science City, Japan, May 2013.

Organization: IEEE Communications Society
Activity: Technical Program Committee, IEEE Wireless Communications and Networking Conference (WCNC), Istanbul, Turkey, April 2014.

Organization: IEEE Communication Society
Activity: Technical Program Committee, IEEE *33rd Conference on Computer Communications* (INFOCOM), Toronto, Canada, April 27 – May 2, 2014.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
Activity: Technical Program Committee, The 12nd International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Hammamet, Tunisia, May 2014.

Organization: IEEE Communications Society
Activity: Technical Program Committee, IEEE Wireless Communications and Networking Conference (WCNC), New Orleans, USA, March 2015.

Organization: IEEE Communication Society
Activity: Technical Program Committee, Distinguished TPC Member (top 25% of the TPC members), IEEE *34th Conference on Computer Communications* (INFOCOM), Hong Kong, China, April 26 – May 1, 2015.

Organization: IEEE Information Theory Society
Activity: Associate Editor of IEEE Transactions on Information Theory, Area: Coding Techniques. May 2014 to April 2017.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
Activity: Technical Program Committee, The 13th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Mumbai, India, May 2015.

Organization: National Science Foundation
Activity: Proposal Panelist, February 2015

Organization: IEEE Communications Society
Activity: Technical Program Committee, IEEE Wireless Communications and Networking Conference (WCNC), Doha, Qatar, April 2016.

Organization: IEEE Communication Society
Activity: Technical Program Committee, IEEE *35th Conference on Computer Communications* (INFOCOM), San Francisco, USA, April 10 – 15, 2016.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
Activity: Technical Program Committee, The 14th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Tempe, Arizona, May 2016.

Organization: National Science Foundation
Activity: Proposal Panelist, March 2017

Organization: IEEE Information Theory Society
Activity: Technical Program Co-Chair, IEEE Information Theory Workshop, November 2017

Organization: IEEE Communications Society
Activity: Technical Program Committee, IEEE Wireless Communications and Networking Conference (WCNC), San Francisco, USA, March 19-22, 2017.

Organization: IEEE Communication Society
Activity: Technical Program Committee, IEEE *International Conference on Computer Communications* (INFOCOM), Atlanta, USA, May 1-4, 2017.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
Activity: Technical Program Committee, The 15th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Paris, France, May 2017.

Organization: National Science Foundation
Activity: Proposal Panelist, March 2018

Organization: IEEE Communication Society

Activity: Technical Program Committee, IEEE *International Conference on Computer Communications* (INFOCOM), Honolulu, USA, April 15-19, 2018.

Organization: IEEE Communications Society
Activity: Technical Program Committee, IEEE Wireless Communications and Networking Conference (WCNC), Barcelona, Spain, April 15-18, 2018.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
Activity: Technical Program Committee, The 16th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Shanghai, China, May 7-11, 2018.

Organization: IEEE Communication Society
Activity: Technical Program Committee, IEEE *International Conference on Computer Communications* (INFOCOM), Paris, France, April 29- May 2, 2019.

Organization: IEEE Communications Society
Activity: Technical Program Committee, IEEE Wireless Communications and Networking Conference (WCNC), Marrakech, Morocco, April 15-18, 2019.

Organization: IEEE Information Theory Society; and IEEE Control Systems Society
Activity: Technical Program Committee, The 17th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), Avignon, France, June 4-6, 2019.

PhD Thesis Supervision Completed

Abdallah Khreishah PhD (April, 2010) (co-supervised with Prof. Ness B. Shroff)

Gyu Bum Kyung PhD (May, 2011)

Xiaohang Li PhD (January, 2013) (co-supervised with Prof. Xiaojun Lin)

Wei-Cheng Kuo PhD (May, 2015)

Jaemin Han PhD (May, 2016)

Imad Ahmad PhD (May, 2016)

Master's Thesis Supervision Completed

None.

Master's and PhD Thesis Students Currently Being Supervised (serving as chair or co-chair)

2014 - present

Jia Zhang PhD

2015 - present

Chih-Hua Chang PhD

2017 - present

Pin-Wen Su PhD

2017 - present

Cho-Hsin Tsai PhD

Master's Committee Membership (not serving as chair)

Yousef Mohammad Hajjat	MS thesis
Ritesh Nagpal	MS thesis
Manu Sharma	MS thesis
Soumyadip Banerjee	MS non-thesis
Min-hee Jun	MS non-thesis
Misook Kim	MS non-thesis
Jaeyoung Park	MS non-thesis
Akshya Gupta	MS non-thesis

Ph.D. Committee Membership (not serving as chair)

Mayur Agrawal	PhD
Ziad Ahmad	PhD
Mohammad Yousef Hajjat	PhD
Po-Kai Huang	PhD
Landis M. Huffman	PhD
Venkata Venkatachalam Jayaraman	PhD
Myeong Kang	PhD
Joon Young Kim	PhD
Dimitrios Koutsonikolas	PhD
Mu-Sheng Lin	PhD
Hung-Yi Lo	PhD
Mir Hamza Mahmood	PhD

Song Noh	PhD
Joo Sung Park	PhD
Tariq Rashid Qureshi	PhD
Sarah Sellke	PhD
Donghoon Shin	PhD
Shun-Te Tseng	PhD
Dawei Ying	PhD
Bin Zhao	PhD
Can Zhao	PhD
Shizhen Zhao	PhD

ECE Project (495, 496, 695, 696, 697) Supervision Completed

Faculty co-advisor	Software-Defined Radio Team of VIP	Fall 08 --- Fall 17
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Courses Developed

EE 695C Inference Methods for Codes on Graphs (Fall 2007, Fall 2009, Spring 2012)

Courses "In Charge Of"

EE 695C Inference Methods for Codes on Graphs (Fall 2007, Fall 2009, Spring 2012)

School Committee Activities

Committee: Communications, Networking, Signal and Image Processing Area Committee

Activity: Member, 2006 - present

Committee: Admission Committee

Activity: Member, 2006 - present

Committee: Qualification Exam Committee

Activity: Member, 2007 - 2009

Committee: Curriculum Committee

Activity: Member, 2009 - 2011, 2018 - present

Engineering-Wide Committee Activities

None.

University-Wide Committee Activities

None.

Research Book Contributions and Books Published

None.

Serial Journal Articles

- [1] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, "Density Evolution for Asymmetric Memoryless Channels," *IEEE Transactions on Information Theory*, vol. 51, no. 12, pp. 4216 – 4236, December 2005.
- [2] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, "Arbitrary Side Observations in Bandit Problems," *Advances in Applied Mathematics, special issue dedicated to Dr. David P. Robbins*, vol. 34, no. 4, pp. 903 - 938, May 2005.
- [3] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, "Bandit Problems with Side Observations," *IEEE Transactions on Automatic Control*, vol. 50, no. 5, pp. 338 - 355, May 2005.
- [4] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, "Finite-Dimensional Bounds on Z_m and Binary LDPC Codes with Belief Propagation Decoders," *IEEE Transactions on Information Theory*, vol. 53, no. 1, pp. 56 – 81, January 2007.
- [5] D. Guo and C.-C. Wang, "Multiuser Detection of Sparsely Spread CDMA," *IEEE Journal on Selected Areas in Communications*, vol. 26, no. 3, pp. 421 – 431, April 2008.
- [6] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, "Finding All Small Error-Prone Substructures in LDPC Codes," *IEEE Transactions on Information Theory*, vol. 55, no. 5, pp. 1976 – 1998, May 2009.
- [7] A. Khreishah, C.-C. Wang, and N.B. Shroff, "Cross-layer Optimization for Wireless Multihop Networks with Pairwise Intersession Network Coding," *IEEE Journal on Selected Areas in Communications*, vol. 27, no. 5, pp. 606 – 621, June 2009.

- [8] C.-C. Wang, "Pruning Network Coding Traffic By Network Coding - A New Class of Max-Flow Algorithms," *IEEE Transactions on Information Theory*, vol. 56, no. 4, pp. 1909-1929, April 2010.
- [9] A. Khreishah, C.-C. Wang, and N.B. Shroff, "Rate Control with Pairwise Inter-session Network Coding," *IEEE Transactions on Networking*, vol. 18, no. 3, pp. 816 – 829, June 2010.
- [10] C.-C. Wang and Ness B. Shroff, "Pairwise Intersession Network Coding On Directed Networks," *IEEE Transactions on Information Theory*, vol. 56, no. 8, pp. 3879-3900, August 2010.
- [11] G. Kyung and C.-C. Wang, "Towards a Practical Scheme for Binary Broadcast Channels with Varying Channel Quality Using Dirty Paper Coding," *IEEE Transactions on Communications*, vol. 59, no. 4, pp. 1009-1018, April 2011.
- [12] X. Li, C.-C. Wang, and X. Lin "On The Capacity of Immediately-Decodable Coding Schemes for Wireless Stored-video Broadcast with Hard Deadline Constraints," *IEEE Journals on Selected Areas of Communication*, vol. 29, no. 5, pp. 1094-1105, May 2011.
- [13] D. Koutsonikolas, Y.C. Hu, and C.-C. Wang, "Efficient Network Coding Based Opportunistic Routing Through Cumulative Coded Acknowledgment," *IEEE Transactions on Networking*, vol. 19, no. 5, pp. 1368-1381, October 2011.
- [14] D. Koutsonikolas, C.-C. Wang, Y.-C. Hu, and N.B. Shroff, "FEC-Based AP Downlink Transmission Schemes For Multiple Flows: Combining The Reliability and Throughput Enhancement of Intra- and Inter-flow Coding," *Elsevier Performance Evaluation (PEVA)*, vol. 68, no. 11, pp. 1118-1135, November 2012.
- [15] C.-C. Wang, "On The Capacity of 1-to-K Broadcast Packet Erasure Channels with Channel Output Feedback," *IEEE Transactions on Information Theory*, vol. 58, no. 2, pp. 931-956, February 2012.
- [16] C.-C. Wang, "On the Capacity of Wireless 1-Hop Intersession Network Coding – A Broadcast Packet Erasure Channel Approach," *IEEE Transactions on Information Theory*, vol. 58, no. 2, pp. 957-988, February 2012.
- [17] G.B. Kyung and C.-C. Wang, "Finding The Exhaustive List of Small Fully Absorbing Sets and Designing The Corresponding Low Error-Floor Decoder," *IEEE Transactions on Communications*, vol. 60, no. 6, pp. 1487-1498, June 2012.

- [18] D. Koutsonikolas, Y.-C. Hu, and C.-C. Wang, "Pacifier: High-Throughput, Reliable Multicast Without Crying Babies in Wireless Mesh Networks," *IEEE Transactions of Networking*, vol. 20, no. 5, pp. 1375-1388, October 2012.
- [19] P.-K. Huang, X. Lin, and C.-C. Wang, "A Low-Complexity Congestion Control and Scheduling Algorithm for Multihop Wireless Networks With Order-Optimal Per-Flow Delay," *IEEE Transactions of Networking*, vol. 21, no. 2, pp. 495-508, April, 2013.
- [20] W.-C Kuo and C.-C. Wang, "Two-Flow Capacity Region Of The COPE Principle For Two-Hop Wireless Erasure Networks," *IEEE Transactions on Information Theory*, vol. 59, no. 11, pp. 7553-7575, November 2013.
- [21] C.-C. Wang and J. Han, "The Capacity Region of Two-Receiver Multiple-Input Broadcast Packet Erasure Channels With Channel Output Feedback," *IEEE Transactions on Information Theory*, vol. 60, no. 9, pp. 5597-5626, September 2014.
- [22] Z. Ahmad, Z. Chance, D.J. Love, and C.-C. Wang, "Concatenated Coding Using Linear Schemes for Gaussian Broadcast Channels with Noisy Channel Output Feedback," *IEEE Transactions on Communications*, vol. 63, no. 11, pp. 4576-4590, November 2015.
- [23] D. Shin, S. Bagchi, and C.-C. Wang, "Toward Optimal Distributed Monitoring of Multi-Channel Wireless Networks," *IEEE Transactions on Mobile Computing*, vol. 15, no. 7, pp. 1826-1838, June 2016.
- [24] J. Han and C.-C. Wang, "General Capacity Region For The Fully-Connected 3-node Packet Erasure Network", *IEEE Transactions on Information Theory*, vol. 62, no. 10, pp. 5503-5523, October 2016.
- [25] C.-C. Wang and M. Chen, "Sending Perishable Information: Coding Improves Delay-Constrained Throughput Even for Single Unicast", *IEEE Transactions on Information Theory*, vol. 63, no. 1, pp. 252-279, January 2017.
- [26] W.-C. Kuo and C.-C. Wang, "Robust And Optimal Opportunistic Scheduling For Downlink 2-Flow Network Coding With Varying Channel Quality and Rate Adaptation," *IEEE/ACM Transactions on Networking*, vol. 25, no. 1, pp. 465-479, February 2017.
- [27] X. Li, C.-C. Wang, and X. Lin, "Inter-Session Network Coding Schemes for Two Unicast Sessions with Sequential Hard Deadline Constraints", *IEEE/ACM Transactions on Networking*, vol. 25, no. 1, pp. 624-638, February 2017.

- [28] L. Deng, C.-C. Wang, M. Chen, and S. Zhao, “Timely Wireless Flows with General Traffic Patterns: Capacity Region and Scheduling Algorithms,” *IEEE/ACM Transactions on Networking*, vol. 25, no. 6, pp. 3473-3486, September 2017.
- [29] I. Ahmad and C.-C. Wang, “When Can Intelligent Helper Node Selection Improve the Performance of Distributed Storage Networks?” *IEEE Transactions on Information Theory*, vol. 64, no. 3, pp. 2142-2171, March 2018.
- [30] I. Ahmad and C.-C. Wang, “Locally Repairable Regenerating Codes: Node Unavailability and the Insufficiency of Stationary Local Repair,” *IEEE Transactions on Information Theory*, vol. 64, no. 5, pp. 3493-3512, May 2018.
- [31] S. Kamath, V. Anantharam, D. Tse, and C.-C. Wang, “The two-unicast problem”, *IEEE Transactions on Information Theory*, vol. 64, no. 5, pp. 3865-3882, May 2018.

Serial Journal Correspondence or Letters

None.

Serial Journal Abstracts

None.

Conference Proceedings and Presentations (* for poster / presentation only)

- [1] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, “Bandit Problems with Side Observations,” in *Proceedings of the 41st IEEE Conference on Decision and Control (CDC)*, Las Vegas, USA, December 10 - 13, 2002, pp. 3988 - 3993.
- [2] C.-C. Wang, S.R. Kulkarni, H.V. Poor, “Density Evolution for Asymmetric Memoryless Channels,” in *Proceedings of the 3rd International Symposium on Turbo Codes & Related Topics*, Brest, France, September 1 - 5, 2003, pp. 121 - 124.

- [3] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, "Bandit Problems with Arbitrary Side Observations," In *Proceedings Of The 42nd IEEE Conference On Decision And Control (CDC)*, Maui, USA, December 9 - 12, 2003, pp. 2948 -2953.
- [4] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, "On Finite-Dimensional Bounds for LDPC-Like Codes with Iterative Decoding," in *Proceedings of the International Symposium on Information Theory and its Applications (ISITA)*, Parma, Italy, October, 10 - 13, 2004, 6 pages.
- [5] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, "On The Typicality of the Linear Code Among the LDPC Coset Code Ensemble," in *Proceedings of the 39th Conference on Information Sciences and Systems (CISS)*, Baltimore, USA, March 16 - 18, 2005, 6 pages.
- [6] C.-C. Wang, S.R. Kulkarni, and H.V. Poor, "Upper Bounding the Performance Of Arbitrary Finite LDPC Codes on Binary Erasure Channels," in *Proceedings of 2006 IEEE International Symposium on Information Theory (ISIT)*, Seattle, USA, July 9 - 14, 2006, pp. 411 - 415.
- [7] S. Sellke, N.B. Shroff, S. Bagchi, and C.-C. Wang, "Timing Channel Capacity for Uniform and Gaussian Servers" in *Proceedings of the 44-th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, USA, September 27 - 29, 2006, pp. 1485 - 1486.
- [8] C.-C. Wang and D. Guo, "Belief Propagation is Asymptotically Equivalent to MAP Detection for Sparse Linear Systems" in *Proceedings of the 44-th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, USA, September 27 - 29, 2006, pp. 926 - 935.
- [9] D. Guo and C.-C. Wang, "Asymptotic Mean-Square Optimality of Belief Propagation for Sparse Linear Systems," in *Proceedings of 2006 IEEE Information Theory Workshop (ITW)*, Chengdu, China, October 22-26, 2006, pp. 194 - 198.
- [10] C.-C. Wang, "Code Annealing and the Suppressing Effect of the Cyclically Lifted LDPC Code Ensemble," in *Proceedings of 2006 IEEE Information Theory Workshop (ITW)*, Chengdu, China, October 22-26, 2006, pp. 86 - 90.

- [11] S.H. Sellke, C.-C. Wang, N.B. Shroff, and S. Bagchi, "Capacity Bounds on Timing Channels with Bounded Service Times," in *Proceedings of 2007 IEEE International Symposium on Information Theory (ISIT)*, Nice, France, June 24 - 29, 2007, pp. 981 - 985.
- [12] C.-C. Wang and N.B. Shroff, "Beyond the Butterfly — A Graph-Theoretic Characterization of the Feasibility of Network Coding with Two Simple Unicast Sessions," in *Proceedings of 2007 IEEE International Symposium on Information Theory (ISIT)*, Nice, France, June 24 - 29, 2007, pp. 121 - 125.
- [13] D. Guo, C.-C. Wang "Random Sparse Linear Systems Observed Via Arbitrary Channels: A Decoupling Principle," in *Proceedings of 2007 IEEE International Symposium on Information Theory (ISIT)*, Nice, France, June 24 - 29, 2007, pp. 946 - 950.
- [14] C.-C. Wang, "On the Exhaustion and Elimination of Trapping Sets: Algorithms & The Suppressing Effect," in *Proceedings of 2007 IEEE International Symposium on Information Theory (ISIT)*, Nice, France, June 24 - 29, 2007, pp. 2271 - 2275.
- *[15] C.-C. Wang, A. Khreishah, and N.B. Shroff, "On Characterizing the Throughput Degradation for Network Coding with Two Sessions," presented in the 2nd Mathematical Programming Society International Conference on Continuous Optimization (ICCOPT), Hamilton, ON, Canada, August 13 - 16, 2007.
- [16] C.-C. Wang, and N.B. Shroff, "Intersession Network Coding for Two Simple Multicast Sessions," in *Proceedings of the 45-th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, USA, September 26 - 28, 2007, pp. 682 - 689.
- [17] A. Khreishah, C.-C. Wang, and N.B. Shroff, "Capacity Regions for Multiple Unicast Flows Using Inter-session Network Coding," in *Proceedings of the 3rd Annual International Wireless Internet Conference (WICON)*, Austin, TX, USA, October 22-24, 2007, 10 pages.
- [18] C.-C. Wang and N.B. Shroff, "On Wireless Network Scheduling with Intersession Network Coding," in *Proceedings of the 42nd Conference on Information Sciences and Systems (CISS)*, Princeton, USA, March 19 - 21, 2008, pp. 30 - 35.

- [19] A. Khreishah, C.-C. Wang, and N.B. Shroff, "An Optimization Based Rate Control for Communication Networks with Inter-session Network Coding," in *Proceedings of the 27th Conference on Computer Communications (INFOCOM)*, Phoenix, USA, April 15-17, 2008, pp. 520 - 528.
- *[20] C.-C. Wang, "Recent Graph-Theoretic Progress of Network Coding - from Characterization Theorems to New Graph Algorithms," presented in the Workshop on Information Theory and Wireless Communications, McMaster University, Hamilton, ON, Canada, July 2008.
- [21] C.-C. Wang, "Pruning Network Coding Traffic By Network Coding — A New Max-Flow Algorithm," in *Proceedings of 2008 IEEE International Symposium on Information Theory (ISIT)*, Toronto, Canada, July 6 - 11, 2008, pp. 26 - 30.
- *[22] D. Koutsonikolas, Y. C. Hu, C.-C. Wang, "XCOR: Synergistic Interflow Network Coding and Opportunistic Routing," presented in *ACM International Conference on Mobile Computing and Networking (MobiCom)*, San Francisco, USA, September 14-19, 2008. 3rd place in ACM Student Research Competition (SRC).
- [23] C.-C. Wang, "A Coded-Feedback Approach for Constructing Minimum-Cost Multicast Network Codes," in *Proceedings of 46th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, USA, September 23-26, 2008, pp. 146 - 153.
- *[24] C.-C. Wang, "Recent Developments On Resource Allocation for Wireless Mesh Networks," presented in *the 4th Annual International Wireless Internet Conference (WICON)*, Maui, USA, November 17 - 19, 2008.
- [25] G.B. Kyung and C.-C. Wang, "On the Designs and Challenges of Practical Binary Dirty Paper Coding," in *Proceedings of IEEE Wireless Communications and Networking Conference (WCNC)*, Budapest, Hungary, April 5 - 8, 2009, pp. 1-6.
- [26] S.H. Sellke, C.-C. Wang, S. Bagchi, and N.B. Shroff, "Covert TCP/IP Timing Channels: Theory to Implementation," in *Proceedings of the 28th Conference on Computer Communications (INFOCOM)*, Rio de Janeiro, Brazil, April 19 - 25, 2009, pp. 2204-2212.

- [27] D. Koutsonikolas, Y. C. Hu, and C.-C. Wang, "Pacifier: High-Throughput, Reliable Multicast without "Crying Babies" in Wireless Mesh Networks," in *Proceedings of the 28th Conference on Computer Communications (INFOCOM)*, Rio de Janeiro, Brazil, April 19 – 25, 2009, pp. 2473-2481.
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- *[30] D. Koutsonikolas, C.-C. Wang, and Y.C. Hu, "Designing Coded Feedback for Efficient Network Coding Based Opportunistic Routing," presented in *ACM International Conference on Mobile Computing and Networking (MobiCom)*, Beijing, China, September 20-25, 2009. 1st place in ACM Student Research Competition (SRC).
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- [38] P.-K. Huang, C.-C. Wang, and X. Lin, "A Low-Complexity Congestion Control and Scheduling Algorithm for Multihop Wireless Networks with Order-Optimal Per-Flow Delay," in *Proceedings of the 30th Conference on Computer Communications (INFOCOM)*, Shanghai, China, April 10 – 15, 2011, pp. 2588–2596.
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- *[45] D. Koutsonikolas, C.-C. Wang, Y.-C. Hu, and N.B. Shroff, "FEC-Based AP Downlink Transmission Schemes For Multiple Flows: Combining The Reliability and Throughput Enhancement of Intra- and Inter-flow Coding", presented in the *29th International Symposium on Computer Performance, Modeling, Measurements and Evaluation (IFIP Performance)*, Amsterdam, Netherlands, October 18-20, 2011, pp. 1118-1135.
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- [49] C.-C. Wang and D. J. Love, "Linear Network Coding Capacity Region of 2-Receiver MIMO Broadcast Packet Erasure Channels with Feedback," in *Proceedings of 2012 IEEE International Symposium on Information Theory*, Boston, USA. July 1 – 6, 2012, pp. 2062-2066.
- [50] C.-C. Wang, "Capacity Region of Two Symmetric Nearby Erasure Channels With Channel State Feedback," in *Proceedings of 2012 IEEE Information Theory Workshop*, Lausanne, Switzerland. September 3–7, 2012, 5 pages.
- [51] D. Shin, S. Bagchi, and C.-C. Wang, "Toward Optimal Sniffer-Channel Assignment for Reliable Monitoring in Multi-Channel Wireless Networks," in *Proceedings of the IEEE International Conference on Sensing, Communication, and Networking (SECON)*, Singapore, June 30-July 3, 2013, 9 pages.
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- [53] W.-C. Kuo and C.-C. Wang, "Robust and Optimal Opportunistic Scheduling for Downlink 2-Flow Inter-session Network Coding," in *Proceedings of the 33rd Conference on Computer Communications (INFOCOM)*, Toronto, Canada, April 27 – May 2, 2014, 9 pages.
- [54] C.-C. Wang and M. Chen, "Sending Perishable Information: Coding Improves Delay-Constrained Throughput Even for Single Unicast," in *Proceedings of the IEEE International Symp. Information Theory (ISIT)*, Honolulu, Hawaii, USA, June 29 – July 4, 2014, 5 pages.
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- [57] I. Ahmad and C.-C. Wang, "When Locally Repairable Codes Meet Regenerating Codes – What If Some Helpers Are Unavailable" in *Proceedings of the IEEE International Symp. Information Theory (ISIT)*, Hong Kong, China, June 14 – 19, 2015, 5 pages.

- [58] J. Zhang, X. Lin, C.-C. Wang, and X. Wang, “Coded Caching For Files With Distinct File Sizes” in Proceedings of the IEEE International Symp. Information Theory (ISIT), Hong Kong, China, June 14 – 19, 2015, 5 pages.
- [59] J. Han and C.-C. Wang, “General Capacity Region For The Fully-Connected 3-Node Packet Erasure Network” in Proceedings of the IEEE International Symp. Information Theory (ISIT), Hong Kong, China, June 14 – 19, 2015, 5 pages.
- [60] L. Deng, C.-C. Wang, M. Chen, S. Zhao, “Timely Wireless Flows with Arbitrary Traffic Patterns: Capacity Region and Scheduling Algorithms,” in Proceedings of the IEEE International Conference on Computer Communications (INFOCOM), San Francisco, USA, April 10 – 15, 2016, 9 pages.
- [61] C.-C. Wang, “Delay-Constrained Capacity For Broadcast Erasure Channels: A Linear-Coding-Based Study” in Proceedings of the IEEE International Symp. Information Theory (ISIT), Barcelona, Spain, July 10 – 15, 2016, 5 pages.
- [62] J. Han and C.-C. Wang, “Linear Network Coding Capacity Region of The Smart Repeater with Broadcast Erasure Channels” in Proceedings of the IEEE International Symp. Information Theory (ISIT), Barcelona, Spain, July 10 – 15, 2016, 5 pages.
- [63] M. Chen, Y. Tian, and C.-C. Wang, “On Coding Capacity of Delay-Constrained Network Information Flow: An Algebraic Approach” in Proceedings of the IEEE International Symp. Information Theory (ISIT), Barcelona, Spain, July 10 – 15, 2016, 5 pages.
- [64] C.-H. Chang and C.-C. Wang, “A New Capacity-Approaching Protocol for General 1-to-K Broadcast Packet Erasure Channels with ACK/NACK,” in Proceedings of the IEEE Int'l Symp. Information Theory (ISIT), Aachen, Germany, June 25 – 30, 2017, 5 pages.
- [65] C.-C. Wang, D.J. Love, and D. Ogbe, “Transcoding: A New Strategy for Relay Channels,” in Proceedings of 55th Annual Allerton Conference on Communication, Control, and Computing, Monticello, Illinois, October 4-6, 2017, 5 pages.
- [66] J. Zhang and C.-C. Wang, “On The Rate-Cost of Gaussian Linear Control Systems with Random Communication Delays,” in Proceedings of the IEEE Int'l Symp. Information Theory (ISIT), Veil, Colorado, USA, June 17 – 22, 2018, 5 pages.

- [67] I. Ahmad and C.-C. Wang, "Flexible Fractional Repetition Codes for Distributed Storage Networks," in Proceedings of 56th Annual Allerton Conference on Communication, Control, and Computing, Monticello, Illinois, October 3-5, 2018, 8 pages.

Invited Lectures and Short Visits

- [1] "Low-Density Parity-Check Codes for Symmetric and Non-symmetric Channels," Northwestern University, Evanston, Illinois, April 8, 2005.
- [2] "Recent Graph-theoretic Progress of Network Coding - from Characterization Theorems to new Graph Algorithms," Workshop on Information Theory and Wireless Communications, McMaster University, Hamilton, Ontario, Canada, July 6, 2008.
- [3] "On the Capacity of Practical Wireless 2-Hop Relay Networks with Intersession Network Coding," Department of Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, USA, February 11, 2010.
- [4] "Bringing Structures Back to Random Linear Network Coding (NC) - From Capacity Results of Wireless 1-Hop Intersession NC to Practical Network Coding Protocols," Department of Electrical Engineering and Computer Science, University of California, Berkeley, CA, USA, March 12, 2010.
- [5] "Capacity-Achieving Network Code Design For Wireless 1-Hop Networks," Department of Electrical Engineering, National Tsing-Tung University, Hsin-Chu, Taiwan, May 31, 2010.
- [6] "Capacity Analysis of Wireless 1-Hop Networks with Message Side Information and with Channel Output Feedback," Department of Communication Engineering, National Chiao Tung University, Hsin-Chu, Taiwan, June 3, 2010.
- [7] "Quantifying and Achieving the Capacity of Wireless 1-Hop Network Coding --- A Code-Alignment-Based Approach," Institute of Network Coding, Department of Information Engineering, The Chinese University of Hong Kong, Shatin, Hong Kong, June 4, 2010.

- [8] “Quantifying and Achieving the Capacity of Wireless 1-Hop Network Coding --- A Code-Alignment-Based Approach: Part I: XOR in The Air, Part II: The Capacity of Packet Erasure Channel with Channel Output Feedback,” Department of Electrical Engineering and Computer Science, Northwestern University, Evanston, USA, August 13, 2010.
- [9] “Quantifying and Achieving the Capacity of Wireless 1-Hop Network Coding --- A Code-Alignment-Based Approach,” Department of Electrical Engineering, University of South California, Los Angeles, USA, November 12, 2010.
- [10] “Capacity of Wireless 1-Hop Relay Networks — From Message Side Information to Joint Scheduling and Network Coding with Delayed Channel Status Feedback,” Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, USA, April 27-28, 2011.
- [11] Short-term scholar visit to Intel-NTU Connected Context Computing Center, Taipei, Taiwan, May 23 – June 3, 2011.
- [12] “Exotic Routing Protocols for Wireless Mesh Networks,” Department of Electrical Engineering, National Taiwan University, Taipei, Taiwan, May 23, 2011.
- [13] “Capacity of Wireless 1-Hop Relay Networks — From Message Side Information to Joint Scheduling and Network Coding with Delayed Channel Status Feedback,” Research Center for Information Technology Innovation, Academia Sinica, New Taipei City, Taiwan, May 26, 2011.
- [14] “Regulating Network Coded Traffic by Network Coded Feedback - An Online Opportunistic Routing Protocol For Wireless Mesh Networks,” Department of Electrical Engineering, National Tsing-Hua University, Hsin-Chu, Taiwan, May 30, 2011.
- [15] “Capacity of Wireless 1-Hop Relay Networks — From Message Side Information to Joint Scheduling and Network Coding with Delayed Channel Status Feedback,” Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, USA, August 29, 2011.
- [16] “Introduction of Network Coding: From fundamental principles to protocol design to grand challenges,” 2-day short course, National Chiao Tung University, Hsin-Chu, Taiwan, June 9--10, 2012.

- [17] “Multi-Unicast Capacity of Packet-Level Network Coding on Small Wireless Networks,” Institute of Network Coding, Department of Information Engineering, The Chinese University of Hong Kong, Shatin, Hong Kong, August 21, 2013.
- [18] “Multi-Unicast Capacity of Packet-Level Network Coding on Small Wireless Networks,” University of Hong Kong, November 8, 2013.
- [19] “Multi-Unicast Capacity of Packet-Level Network Coding on Small Wireless Networks,” Intel-NTU Connected Context Computing Center, Taipei, Taiwan, November 25, 2013.
- [20] “Multi-Unicast Capacity of Packet-Level Network Coding on Small Wireless Networks,” University of Toronto, Canada, April 29, 2014.
- [21] “Toward Practical Implementation of Throughput-Optimal Network Codes - Issues and New Theoretic Development,” Research Center for Information Technology Innovation, Academia Sinica, New Taipei City, Taiwan, August 13, 2014.
- [22] “Toward Practical Implementation of Throughput-Optimal Network Codes - Issues and New Theoretic Development,” University of Tennessee, Knoxville, TN, USA, October 13, 2014.
- [23] “Transcoding – A New Strategy for Relay Channels,” Auburn University, ECE, Auburn, AL, USA, November 28, 2018.
- [24] “Transcoding – A New Strategy for Relay Channels,” Northwestern University, EECS, Evanston, IL, USA, December 03, 2018.

Published Reviews

None.

Technical Reports

- [1] D. Koutsonikolas, Y.C. Hu and C.-C. Wang, “TR ECE 08-11: An Empirical Study of Performance Benefits of Network Coding in Multihop Wireless Networks,” 2008.
<http://docs.lib.purdue.edu/ecetr/380/>
- [2] D. Koutsonikolas, C.-C. Wang, and Y.C. Hu, “TR-ECE-09-13: CCACK: Efficient Network Coding Based Opportunistic Routing Through Cumulative Coded Acknowledgments,” 2009.
<http://docs.lib.purdue.edu/ecetr/394/>

- [3] S.H. Sellke, C.-C. Wang, S. Bagchi, and N.B. Shroff, "TR-ECE-09-14: Camouflaging Timing Channels in Web Traffic," 2010.
<http://docs.lib.purdue.edu/ecetr/393/>
- [4] D. Koutsonikolas, C.-C. Wang, Y.C. Hu, and N.B. Shroff, "TR-ECE-06-05, Designing an Efficient Retransmission Scheme for Wireless LANs: Theory and Implementation," 2010.
<http://docs.lib.purdue.edu/ecetr/401>
- [5] X. Li, C.-C. Wang, and X. Lin, "TR-ECE-10-04: Throughput and Delay Analysis on Uncoded and Coded Wireless Broadcast with Hard Deadline Constraints," 2010.
<http://docs.lib.purdue.edu/ecetr/398/>
- [6] D. Koutsonikolas, C.-C. Wang, Y.C. Hu, and N.B. Shroff, "TR-ECE-10-05, Designing an Efficient Retransmission Scheme for Wireless LANs: Theory and Implementation," 2010.
<http://docs.lib.purdue.edu/ecetr/400>
- [7] X. Li, C.-C. Wang, and X. Lin, "TR-ECE-10-11, On The Capacity of Immediately-Decodable Coding Schemes for Wireless Stored-video Broadcast with Hard Deadline Constraints," 2010.
<http://docs.lib.purdue.edu/ecetr/406>
- [8] X. Li, C.-C. Wang, and X. Lin, "TR-ECE-11-17, Optimal Immediately-Decodable Inter-session Network Coding (IDNC) Schemes for Two Unicast Sessions with Hard Deadline Constraints," 2011.
<http://docs.lib.purdue.edu/ecetr/423>
- [9] D. Shin, S. Bagchi, and C.-C. Wang, "TR-ECE-12-01: Distributed Online Channel Assignment Toward Optimal Monitoring in Multi-Channel Wireless Networks," 2012.
<http://docs.lib.purdue.edu/ecetr/427/>
- [10] X. Li, C.-C. Wang, and X. Lin, "TR-ECE-12-06, Inter-Session Network Coding Schemes for Two Unicast Sessions with Sequential Hard Deadline Constraints," 2012.
<http://docs.lib.purdue.edu/ecetr/432>
- [11] P.-K. Huang, X. Lin, and C.-C. Wang, "TR-ECE-12-07, A Low-Complexity Congestion Control and Scheduling Algorithm for Multihop Wireless Networks with Order-Optimal Per-Flow Delay," 2012.
<http://docs.lib.purdue.edu/ecetr/433>

- [12] X. Li, X. Tang, C.-C. Wang, and X. Lin, “TR-ECE-13-01, Gibbs-Sampling-based Optimization for the Deployment of Small Cells in 3G Heterogeneous Networks,” 2013.
<http://docs.lib.purdue.edu/ecetr/440/>
- [13] J. Han, C.-C. Wang, and N.B. Shroff, “TR-ECE-14-04, Graph-Theoretic Characterization of the Feasibility of the Precoding-Based 3-Unicast Interference Alignment Scheme,” 2014.
<http://docs.lib.purdue.edu/ecetr/457/>
- [14] J. Han and C.-C. Wang, “TR-ECE-14-06: Optimal Linear Network Coding When 3 Nodes Communicate Over Broadcast Erasure Channels with ACK,” 2014.
<http://docs.lib.purdue.edu/ecetr/459/>
- [15] W.-C. Kuo and C.-C. Wang, “Robust And Optimal Opportunistic Scheduling For Downlink 2-Flow Network Coding With Varying Channel Quality and Rate Adaptation”, 2014.
<http://docs.lib.purdue.edu/ecetr/462/>

Pending Publications

- [1] C.-H. Chang and C.-C. Wang, “A New Capacity-Approaching Protocol for General 1-to-K Broadcast Packet Erasure Channels with ACK/NACK” submitted to IEEE Transactions on Information Theory, August, 2018, 61 pages (in the single-column double-space submission format).

Patents Approved and Patent Applications

None.

Activities as a Referee

2005 – present	IEEE Transactions on Information Theory
2011 – 2014	IEEE Transactions on Parallel and Distributed Systems
2008 – 2013	Elsevier Computer Networks (COMNET), The International Journal of Computer and Telecommunications Networking
2004 – 2014	IEEE Transactions on Communications
2008 – 2014	IEEE Transactions on Networking

2008 – 2011	IEEE Transactions on Vehicular Technology
2003, 2009	IEEE Transactions on Signal Processing
2009	IEEE Communication Letters
2008	Defense Threat Reduction Agency
2008	IEEE Transactions on Wireless Communications
2004 – 2014	IEEE Transactions on Automatic Control
2008	IEEE Journal on Selected Areas in Communications
2006	Annals of Statistics
2004	Annals of Applied Probability
2004	Journal Mathematical Modeling and Analysis
2007 – 2012	IEEE International Symposium on Information Theory
2009	IEEE Vehicular Technology Conference
2009	IEEE International Conference on Communications
2007	IEEE Wireless Communications and Networking Conference
2006	IEEE GLOBECOM
2005	ACM SIGCOMM Asia Workshop
2005	International Symposium on Power-Line Communications and its Applications
2003	Proceedings of the International Symp. on Turbo Codes and its Related Topics.

Editorial Positions

2014 – 2017 Associate Editor of IEEE Transactions on Information Theory; Area: Coding Techniques.

Special Projects, Short Courses, etc. -- Contribution

None.

Short Courses and Workshops Attended:

None.

Other Activities:

Attended the 3-day Multicultural Forum of Purdue University, in Tecumseh Leadership Center, October 16-18, 2006.