

Curriculum Vitae

Name: Wei-Cheng Liu

Mailing address.

Department of Communications Engineering,
National Chung Cheng University
Room 413-1, Common Class Building
168 University Rd., Min-Hsiung, Chia-Yi, Taiwan 62102
Phone: +886-5-272-0411 ext 33516 **Fax:** +886-5-272-2702
E-mail Address: comwcliu@ccu.edu.tw

Specialized Areas. Wireless Communications, Cross-layer Design for Wireless Systems, Radio Resource Management

Current Research Focus. Device-to-Device Communications, 5G Channel Models

Education.

- PhD, Communications Engineering, National Chiao Tung University, 2003–2008
- Minor, Applied Mathematics, National Chiao Tung University, 2004–2008
- MS, Electrical Engineering, National Tsing Hua University, 1999–2001
- BS, Electrical Engineering, National Tsing Hua University, 1995–1999

Awards.

- Outstanding Teaching Assistant Award at National Chiao Tung University, 2008
- Pre-U TAsip at National Chiao Tung University, Spring 2008
- Ministry of Education's Ph.D. Scholarship at National Chiao Tung University, Spring 2004, Fall 2004, and Spring 2005
- Presidential Award in the Department of Electrical Engineering, National Tsing Hua University, Fall 1995 and Fall 1997

Employment.

- Assistant Professor, Department of Communications Engineering, National Chung Cheng University, 2009–present
- Post-doctorate researcher, Department of Communications Engineering, National Chiao Tung University, 2008–2009
- GSM Layer-1 Software Engineer, Compal Communications, 2002
- Military Service, Cheng Gong Ling, 2001–2002

Teaching Experience.

Undergraduate level.

- (1) Pre-Ph.D. Teaching Assistant of *Probability*, Department of Communications Engineering, National Chiao Tung University, Spring 2008
- (2) Teaching Assistant of *Probability*, Electrical Engineering and Computer Science Undergraduate Honors Program, National Chiao Tung University, Fall 2006 and Fall 2007
- (3) Teaching Assistant of *Probability*, Department of Electrical Engineering, National Tsing Hua University, Fall 2000

Graduate level.

- (1) Teaching Assistant of *Queueing Theory*, Degree Program of ECE Colleges, National Chiao Tung University, Fall 2006
- (2) Teaching Assistant of *Wireless Communications*, Institute of Communications Engineering, National Chiao Tung University, Spring 2005

Publications.

Important Publications in the Past Five Years (2011–2015).

- (1) Wei-Cheng Liu and Chun-Huan Shih, “The performance of systems featuring dynamic decode-and-forward and network coding,” *Wireless Personal Communications*, Aug. 2014. DOI 10.1007/s11277-014-2024-4 (SCI, EI)
- (2) Li-Chun Wang, Wei-Cheng Liu, and Sau-Hsuan Wu, “Analysis of diversity-multiplexing tradeoff in a cooperative network coding system,” *IEEE Transactions on Communications*, vol. 59, no. 9, pp. 2373-2376, Sep. 2011. (SCI, EI)

Master Thesis. Wei-Cheng Liu, “Combined detection and decoding for OFDM-based wireless local area networks,” Department of Electrical Engineering, National Tsing Hua University, Hsinchu, Taiwan, July 2001 (Advisor: Prof. Chi-chao Chao).

Ph.D. Dissertation. Wei-Cheng Liu, “Analysis and design in UWB, mobile-to-mobile, and relay channels with MIMO antenna techniques,” Department of Communications Engineering, National Chiao Tung University, Hsinchu, Taiwan, July 2008 (Advisor: Prof. Li-Chun Wang).

Journal Papers.

- (1) Wei-Cheng Liu and Chun-Huan Shih, “The performance of systems featuring dynamic decode-and-forward and network coding,” *Wireless Personal Communications*, Aug. 2014. DOI 10.1007/s11277-014-2024-4 (SCI, EI)
- (2) Li-Chun Wang, Wei-Cheng Liu, and Sau-Hsuan Wu, “Analysis of diversity-multiplexing tradeoff in a cooperative network coding system,” *IEEE Transactions on Communications*, vol. 59, no. 9, pp. 2373-2376, Sep. 2011. (SCI, EI)
- (3) Li-Chun Wang and Wei-Cheng Liu, “Bit error rate analysis in IEEE 802.15.3a UWB channels,” *IEEE Transactions on Wireless Communications*, vol. 9, no. 5, pp. 1537-1542, May 2010. (SCI, EI)
- (4) Li-Chun Wang, Wei-Cheng Liu, and Yun-Huai Cheng, “Capacity fades analysis of MIMO Rician channels in mobile ad hoc networks,” *Elsevier Performance Evaluation*, vol. 66, no. 12, pp. 742-753, Dec. 2009. (SCI, EI)
- (5) Li-Chun Wang, Wei-Cheng Liu, Anderson Chen, and Kuang-Nan Yen, “Joint rate and power adaptation for wireless local area networks in generalized Nakagami fading channels,” *IEEE Transactions on Vehicular Technology*, vol. 58, no. 3, pp. 1375-1386, Mar. 2009. (SCI, EI)
- (6) Li-Chun Wang, Wei-Cheng Liu, and Yun-Huai Cheng, “Statistical analysis of a mobile-to-mobile Rician fading channel model,” *IEEE Transactions on Vehicular Technology*, vol. 58, no. 1, pp. 32-38, Jan. 2009. (SCI, EI)

- (7) Li-Chun Wang, Wei-Cheng Liu, and Kuan-Jiin Shieh, "On the performance of using multiple transmit and receive antennas in pulse based ultra-wideband systems," *IEEE Transactions on Wireless Communications*, vol. 4, no. 6, pp. 2738-2750, Nov. 2005. (SCI, EI)

Patents.

- (1) Li-Chun Wang, Kuang-Nan Yen, Ming-Bing Chen, Wei-Cheng Liu, Yu-Ren Yang, Ping-Jung Huang, "Cross-layer rate adaptation mechanism for WLAN," China patent (ZL 2005 1 0063361.1), May 5, 2010.
- (2) Li-Chun Wang (NCTU), Kuang-Nan Yen (NCTU), Ming-Bing Chen (NCTU), Wei-Cheng Liu (NCTU), Yu-Ren Yang (ITRI), Ping-Jung Huang (ITRI), "Cross-layer rate adaptation mechanism for WLAN," US patent (No. 7423970), Sep. 9, 2008.
- (3) Li-Chun Wang (NCTU), Wei-Cheng Liu (NCTU), "A searching algorithm for optimal space-time-frequency block codes for multiband MIMO-UWB systems," filed for Taiwan patent on Dec. 23, 2007.
- (4) Li-Chun Wang (NCTU), Kuang-Nan Yen (NCTU), Ming-Bing Chen (NCTU), Wei-Cheng Liu (NCTU), Yu-Ren Yang (ITRI), Ping-Jung Huang (ITRI), "Cross-layer rate adaptation mechanism for WLAN," Taiwan patent (No. I257220), issued on Jun. 21, 2006.

Conference Papers.

- (1) Wei-Cheng Liu and Yu-Chen Liu, "Relay Selection With Enhanced Dynamic Decode-and-Forward and Network Coding," *IEEE VTS APWCS 2014: The 11th IEEE Vehicular Technology Society Asia Pacific Wireless Communications Symposium*, Ping Tung, Taiwan, Aug. 28–29, 2014.
- (2) Wei-Cheng Liu and Yu-Neng Chen, "Dynamic Decode and Forward With Network Coding," *IEEE Vehicular Technology Conference (VTC) 2012 Spring*, Yokohama, Japan, pp. 1–5, May 6–9, 2012. (EI)
- (3) Wei-Cheng Liu, Cheng-Min Chen, and Li-Chun Wang, "Difference of frame inter-arrival time based target selection scheme for reducing handoffs in wireless multi-hop relay networks," *IEEE VTC 2009 Fall*, Anchorage, Alaska, USA, pp. 1–5, Sep. 20–23, 2009. (EI)
- (4) Li-Chun Wang, Wei-Cheng Liu, and Sau-Hsuan Wu, "Diversity-multiplexing tradeoff analysis of a cooperative network coding system," *IEEE Sarnoff Symp. 2009*, Princeton, NJ, USA, pp. 1–5, Mar. 30–Apr. 1, 2009. (EI)
- (5) Li-Chun Wang, Wei-Cheng Liu, and Sau-Hsuan Wu, "Diversity-multiplexing tradeoff analysis of a cooperative network coding system," *The First Joint Workshop of Taiwan National Chiao Tung University and Japan Keio University in Wireless Communications and Networking*, Hsinchu, Taiwan, pp. 37–41, Dec. 16–17, 2008.
- (6) Li-Chun Wang, Wei-Cheng Liu, and Sau-Hsuan Wu, "Analysis of network coding for cooperative multiplexing," *National Symposium on Telecommunications (NST) 2008*, Yunlin, Taiwan, Dec. 5–6, 2008.
- (7) Wei-Cheng Liu and Li-Chun Wang, "BER-minimized space-time-frequency codes for MIMO highly frequency-selective block-fading channels," in *IEEE International Conference on Communications (ICC) 2008*, Beijing, China, pp. 5113–5117, May 19–23, 2008. (EI)

- (8) Wei-Cheng Liu and Li-Chun Wang, "BER analysis in a generalized UWB frequency selective fading channel with randomly arriving clusters and rays," in *IEEE ICC 2007*, Glasgow, Scotland, pp. 4281–4286, Jun. 24–28, 2007. (EI)
- (9) Wei-Cheng Liu and Li-Chun Wang, "Universal space-time-frequency block codes design for the multiband MIMO-OFDM systems," in *IEEE International Symposium on Antennas and Propagation (ISAP)*, Honolulu, Hawaii, USA, pp. 2435–2438, Jun. 10–15, 2007. (EI)
- (10) Wei-Cheng Liu and Li-Chun Wang, "BER analysis of the IEEE 802.15.4a channel model with RAKE receiver," *IEEE VTC 2006 Fall*, Montreal, Canada, pp. 1–5, Sep. 25–28, 2006. (EI)
- (11) Wei-Cheng Liu and Li-Chun Wang, "Performance analysis of pulse based ultra-wideband systems in the highly frequency selective fading channel with cluster property," *IEEE VTC 2006 Spring*, Melbourne, Australia, vol. 3, pp. 1459–1463, May 7–10, 2006. (EI)
- (12) Li-Chun Wang, Kuang-Nan Yen, Anderson Chen, and Wei-Cheng Liu, "Joint rate and power adaptation for wireless local area networks in Nakagami fading channels," *The 11-th Mobile Computing Workshop*, Taoyuan, Taiwan, pp. 80–84, Mar. 31, 2005.
- (13) Li-Chun Wang and Wei-Cheng Liu, "Performance of pulse position modulated signals over the ultra-wideband channel with multiple transmit and receive antennas," *IEEE VTC 2004 Fall*, Los Angeles, USA, vol. 2, pp. 822–826, Sep. 26–29, 2004. (EI)
- (14) Li-Chun Wang, Ya-Wen Lin, and Wei-Cheng Liu, "Cross-layer goodput analysis for rate adaptive IEEE 802.11a WLAN in the generalized Nakagami fading channels," *IEEE ICC 2004*, Paris, France, vol. 4, pp. 2312–2316, Jun. 20–24, 2004. (EI)
- (15) Wei-Cheng Liu, Li-Chun Wang, and Ya-Wen Lin, "Physical layer effects on the MAC goodput performance for the rate adaptive IEEE 802.11a/g WLAN," *IEEE Wireless Communications and Networking Conference (WCNC) 2004*, Atlanta, Georgia USA, vol. 3, pp. 1873–1878, Mar. 21–25, 2004. (EI)

Book.

- (1) Wei-Cheng Liu, *Analysis and Design in UWB, Mobile-to-Mobile, and Relay Channels With MIMO Antenna Techniques*. Saarbrücken, Germany: Golden Light Academic Publishing, 2015.

Professional Activities.

Reviewer of Journals.

- Elsevier Information Sciences
- ETRI Journal
- EURASIP Journal on Advances in Signal Processing
- EURASIP Journal on Wireless Communications and Networking
- IEEE Communications Magazine
- IEEE Signal Processing Letters
- IEEE Transactions on Communications
- IEEE Transactions on Information Theory
- IEEE Transactions on Signal Processing

- IEEE Transactions on Vehicular Technology
- IEEE Transactions on Wireless Communications
- IET Communications
- International Journal of Communication Systems
- International Journal of Electrical Engineering
- Journal of the Chinese Institute of Engineers
- Sensors
- Wireless Networks
- Wireless Personal Communications

International/Domestic Society Services.

- Session Chair in IEEE APWCS 2014, Aug. 29, 2014.
- Session Chair in IEEE WCNC 2014, Apr. 9, 2014.
- Session Chair in IEEE VTC 2010 Spring, May 19, 2010.
- Treasurer of IEEE Information Theory Society Taipei Chapter, Aug. 2007–Jul. 2009.

Conferences Organization.

- Technical Program Committee (TPC) member of IEEE APWCS 2017.
- Program committee of NST-ITCOM 2017.
- Technical Program Committee (TPC) member of International Conference on Wireless Communication and Sensor Network (WCSN 2016).
- TPC member of ICACCI2016 (2016 International Conference on Advances in Computing, Communications and Informatics (ICACCI))
- TPC member of European Conference on Networks and Communications (EuCNC 2016).
- TPC member of IEEE APWCS 2016.
- TPC member of IEEE APWCS 2015.
- TPC member for ICACCI-2015.
- TPC member of EuCNC 2015 - Track 2- Wireless Networks (WIN).
- TPC member of the 2014 IEEE Symposium on Wireless Technology and Applications (ISWTA 2014).
- TPC member of Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC), Xi'an, China, Oct. 18–21, 2011.
- TPC member of “Optical Communications and Networks” track in 2011 13th IEEE International Conference on Communication Technology (IEEE ICCT2011), Jinan, China, Sep. 25–28, 2011.
- TPC member of APSIPA ASC, Singapore, Dec. 14–17, 2010.
- Staff of The First Joint Workshop of Taiwan National Chiao Tung University and Japan Keio University in Wireless Communications and Networking, Hsinchu, Taiwan, Dec. 16–17, 2008.
- Staff of The 4th IEEE VTS APWCS, Hsinchu, Taiwan, Aug. 20–21, 2007.

Projects.

- (1) Common host, “Research on 5th Generation Mobile Cellular Networks with Large-scale Active Antenna System (AAS)(3/3),” Ministry of Science and Technology, Taiwan, Grant No. 105-2622-E-194-001-CC1, Jul. 1, 2016–Jun. 30, 2017.

- (2) Common host, “下世代通訊系統層級模擬器應用於METIS場景委託開發(都會區智慧電網、室外巨量用戶場景及室內毫米波),” Industrial Technology Research Institute, Taiwan, May. 1, 2016–Aug. 31 2017.
- (3) Host, “Performance Analysis of Beam-Domain Processing Systems,” Ministry of Science and Technology, Taiwan, Grant No. 104-2221-E-194-020, Aug. 1, 2015–Jul. 31, 2016.
- (4) Common host, “Research on 5th Generation Mobile Cellular Networks with Large-scale Active Antenna System (AAS)(2/3),” Ministry of Science and Technology, Taiwan, Grant No. 104-2622-E-194-004-CC1, Jul. 1, 2015–Jun. 30, 2016.
- (5) Common host, “下世代通訊系統層級模擬器應用於METIS密集都會區場景委託研究,” Industrial Technology Research Institute, Taiwan, Apr. 1–Oct. 31, 2015.
- (6) Host, “Interference Management for Cognitive Radio-Based Device-to-Device Communication in the Next Generation Mobile Cellular Systems,” Ministry of Science and Technology, Taiwan, Grant No. 103-2221-E-194-014, Aug. 1, 2014–Jul. 31, 2015.
- (7) Host, “Research on Homomorphic Encryption,” Ministry of Science and Technology, Taiwan, Grant No. 102-2221-E-194-012, Aug. 1, 2013–Jul. 31, 2014.
- (8) Host, “Research on the Network Coding Techniques for the Network Architectures with Relays,” Ministry of Science and Technology, Taiwan, Grant No. 101-2221-E-194-037, Aug. 1, 2012–Oct. 31, 2013.
- (9) Host, “Research on the Network Coding Techniques for the Network Architectures with Relays,” Ministry of Science and Technology, Taiwan, Grant No. 100-2221-E-194-048, Aug. 1, 2011–Jul. 31, 2012.
- (10) Common host, “Research on the Next-Generation Cooperative Mobile Cellular Systems with Femto-cells and Relays (1),” Ministry of Science and Technology, Taiwan, Grant No. 99-2221-E-324-012, Aug. 1, 2010–Jul. 31, 2011.
- (11) Host, “Research on the Next-Generation Cooperative Mobile Cellular Systems with Femto-cells and Relays: Subproject (3) Research on the Network Coding Techniques for the Network Architectures with Relays,” Ministry of Science and Technology, Taiwan, Grant No. 99-2221-E-194-004, Aug. 1, 2010–Jul. 31, 2011.
- (12) Host, “Performance Analysis and Design of Cooperative Network Coding Systems,” Ministry of Science and Technology, Taiwan, Grant No. 99-2218-E-194-001, Jan. 1–Oct. 31, 2010.
- (13) Post-doctorate researcher, “Study on Cooperative and Cognitive Radio Networks (CCRN): Subproject (2) MIMO Technologies for Cooperative Cognitive Radio Networks,” Ministry of Science and Technology, Taiwan, Grant No. 97-2221-E-009-099-MY3, Aug. 1, 2008–Jul. 31, 2009.
- (14) Ph.D. student, “Generalized Opportunistic Communications–Competition, Cooperation and Cognition in Wireless Mobile Networks: Subproject (4) Cooperative MAC Protocol Design and User/Base Station Selection in Cognitive Wireless Mobile Networks,” Ministry of Science and Technology, Taiwan, Grant No. 96-2628-E009-004-MY3, Aug. 1, 2007–Jul. 31, 2009.

- (15) Ph.D. student, “Performance of Ultra-Wideband (UWB) Wireless System over the Multi-input Multi-output (MIMO) Channel,” Ministry of Science and Technology, Taiwan, Grant No. 93-2213-E009-097, 94-2213-E009-030, 95-2221-E-009-147, Aug. 1, 2004–Jul. 31, 2007.

Invited Lectures.

- (1) Wei-Cheng Liu, “5G Channel Model,” *InfoTech-2015*, Shenzhen, China, Apr. 18, 2015.
- (2) Wei-Cheng Liu, “The Performance of Systems Featuring Dynamic Decode-and-Forward and Network Coding,” *2013 Spring Workshop on Information Theory & Communications*, Tainan, Taiwan, Jan. 24, 2013.
- (3) Wei-Cheng Liu, “The Information: A History, A Theory, A Flood,” Department of Communications Engineering, Yuan Ze University, Chung-Li, Taiwan, Dec. 7, 2012.
- (4) Wei-Cheng Liu, “Network Coding,” Institute of Computer Science and Information Engineering (CSIE), National Chi Nan University (NCNU), Puli Township, Nantou County, Taiwan, Oct. 12, 2012.
- (5) Wei-Cheng Liu, “Dynamic Decode-and-Forward With Network Coding,” Institute of Communications Engineering, National Sun Yat-sen University (NSYSU), Kaoshiung, Taiwan, May 29, 2012.
- (6) Wei-Cheng Liu, “Performance analysis and design of cooperative network coding systems,” *2010 Spring Workshop on Information Theory & Communications*, Kaoshiung, Taiwan, Feb. 3, 2010.

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