

Curriculum Vitae

Ren-Hung Hwang

Personal Information

Sex Male
Date of birth October, 1963
Citizenship Republic of China
Address Department of Computer Science & Information Engineering
National Chung Cheng University
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Education

Sept. 1989 – May 1993 **Ph.D.** Department of Computer Science
University of Massachusetts
Amherst, MA, 01002
U.S.A.
(GPA=4.0)
Sept. 1987 – Aug. 1989 **Master** Department of Computer Science
University of Massachusetts
Amherst, MA, 01002
U.S.A.
(GPA=4.0)
Sept. 1981 – June 1985 **B.S.** Department of Computer Science
and Information Engineering,
National Taiwan University,
Taipei, Taiwan, R.O.C.
(Rank 3rd in the class)

Academic Employment

August 2020 – present Dean
Office of Information Technology
National Chung Cheng University

August 2009 – present	Distinguished Professor Department of Computer Science and Information Engineering National Chung Cheng University
April 2016 – present	Research Fellow (joint appointment) Institute of Information Science Academia Sinica
Jan. 2014 – Jan. 2017	Dean College of Engineering National Chung Cheng University
March 2012 – Jan. 2016	Deputy Director-General College Admissions Committee
March 2012 – Dec. 2013	Deputy Director Computer Center National Chung Cheng University
Feb. 2010 – Jan. 2011	Director Ching Jiang Learning Center National Chung Cheng University
August 2007 – Jan. 2008	Director e-Learning Center National Chung Cheng University
August 2006 – July 2009	Chairman Department of Computer Science and Information Engineering National Chung Cheng University
August 2005 – Jan. 2006	Visiting scholar Department of Electric Engineering University of Washington Seattle, WA, U.S.A.
August 2002 – July 2005	Chairman Department of Communications Engineering National Chung Cheng University
August 2001 – July 2009	Professor, Department of Computer Science and Information Engineering, National Chung Cheng University Chia-Yi, Taiwan, R.O.C.
May 2000 – July 2002	Division director Research and Development Division Internet Research Center

August 1998 – July 2002
National Chung Cheng University
Division director
Research and Development Division
Computer Center

Dec. 1995 – July 1998
National Chung Cheng University
Division director
Video Technology Division
Video and Audio Center

August 1993 – June 2001
National Chung Cheng University
Associate Professor,
Department of Computer Science
and Information Engineering,
National Chung Cheng University
Chia-Yi, Taiwan, R.O.C.

Industrial Employment

Dec. 2017 – present
Director
Taiwan Network Information Center
Taiwan, R.O.C.

April 2017 – present
Director
National Chung-Shan Institute of Science and
Technology, Taiwan, R.O.C.

April. 2016 – Mar. 2017
Consultant
Chunghwa Telecom Co.,Ltd
Taipei, Taiwan, R.O.C.

Jan. 2008 – Dec. 2008
Consultant
BioLife Technology Co.,Ltd
Taipei, Taiwan, R.O.C.

May 2000 – August 2001
Consultant
UCome Information Technology Company
Kao-Hsiung, Taiwan, R.O.C.

July 2000 – June 2001
Consultant
JoyHub Information Technology Company
Taipei, Taiwan, R.O.C.

May 2000 – Dec. 2002
Consultant
Eastern Multimedia Group
Taipei, Taiwan, R.O.C.

Awards

- Best Paper Award from the 6th International Conference on Internet of Vehicles (IoV), 2019.
- IEEE Best Paper Award from the 11th IEEE International Conference on Ubi-Media Computing (IEEE Ubi-Media 2018), 2018.
- Best Paper Award from the First International Cognitive Cities Conference (IC3), 2018.
- IEEE Best Paper Award from the 7th IEEE International Symposium on Cloud and Service Computing (IEEE SC2 2017), 2017.
- IEEE Best Paper Award from the 13th IEEE International Conference on Ubiquitous Computing and Communications (IUCC 2014), 2014.
- IEEE Outstanding Paper Award from IEEE International Conference on Ubiquitous Intelligence and Computing, 2012 (UIC 2012).
- National Chung Cheng University Award for excellent performance for professor with administration work, 2008.
- Best paper award, 2005 International conference on e-Learning, paper entitled “Design and Implementation of a Learning Object Repository for Heterogeneous e-Learning Portals,” co-authored with Jin-Wen Wang and Yu Lai, 2005.
- Best paper award, the 6th HL7 International Affiliates Meeting and the 4th Asia-Pacific HL7 Conference on Healthcare Information Standards, paper entitled “A study on web services based CDA for medical information exchange system,” co-authored with Jin-Chia Lin and Kuan-Ming Kuo, 2005.
- Best paper award, the 10th Mobile Computing Workshop, paper entitled “MIP6-MANET: The Integration and Implementation of Mobile IPv6 and Mobile Ad Hoc Networks,” co-authored with Yuh-Shyan Chen and Yun-Hsuan Yang, 2004.
- Annual best paper award from Education and Information Magazine, 1997 (paper title: Design and Development of Virtual Classroom over High Speed Networks)

- Best Course Award from 5G Mobile Broadband Talent Development Program, Ministry of Education, Taiwan, 2018.
- Outstanding contribution award on eLearning, TANET, 2008.
- Outstanding Research Award from Engineering College, National Chung Cheng University, 2003.
- Outstanding Teaching Award from National Chung Cheng University, 2002.
- Research Awards from National Science Council, R.O.C. in 1993, 1995, 1998, 1999.
- Awards for Networking related Course Materials from Ministry of Education, R.O.C., in 1997, 1998, 2000, 2010 (awarded courses: BISDN, Video-On-Demand, Next Generation Internet Technologies, Vehicle Positioning and its Applications on e-map)
- National Chung Cheng University Award for excellent performance for professor with

administration work, 1998.

Young Engineer Award from Chinese Engineer Association, Kao-Hsiung chapter, 2000.

Supervise students to win following contests:

Excellent Honor in SDN/NFV Contest held by Ministry of Economics, 2017.

Excellent Honor in IoT Contest (two teams) held by Ministry of Economics, 2016 and 2017.

The second place in Mobile Application Contest held by Ministry of Education, 2013/1.

The second place in Mobile Application Contest held by Ministry of Education, 2012/6.

Excellent Honor (two teams) in Telecommunication Software Competition held by HiNet, 2011.

The second place in Telecommunication Software Competition held by HiNet, 2010.

Excellent Honor, Interuniversity Information Security Contest (hosted by Institute for Information Industry), 2008 and 2009.

Enter final 18 in the Telecommunication Software Competition held by HiNet, 2005-2008.

Ranked 4th in National IPv6 Programming Contest held by NICI (National Information and Communications Initiative Committee), 2004.

Best Technique award in the Mobile Entertainment Application Competition held by III, 2003.

Excellent award in the Open Source Software Development held by Software Liberty Association of Taiwan and III, 2003.

Ranked 5th in the Mobile Hero Competition (wireless software competition) held by Industrial Development Bureau, Ministry of Economic Affairs, 2003.

Selected Award in the 1st Sun Cobalt Innovative Solution Content, 2002.

Research Interests

5G V2X applications (Platooning, automatic driving)

Internet of Things (Security issues, Cyber-Physical systems, Ubiquitous Computing)

Cloud Computing

Mobile Edge Computing (Edge computing, 5G/SDN/NFV)

Cloud-based Large Scale e-Learning system

Selected Publication List

International Journals

1. **Ren-Hung Hwang**, "Routing in VP-based ATM Networks", *Journal of Information Science and Engineering*, Vol. 11, No. 4, Dec. 1995, pp.595-624.

2. **Ren-Hung Hwang**, J. F. Kurose, and D. Towsley, "On Call Processing Delay in High-Speed Networks", *IEEE/ACM Transaction on Networking*, Vol. 3, No. 6, Dec. 1995, pp.628-639.

3. **Ren-Hung Hwang**, and Ching-Houng Chou, "Scheduling in VOD Systems over CATV Networks," *Journal of the Chinese Institute of Electrical Engineering*, Vol. 4, No. 2, 1997, pp. 119-128.
4. **Ren-Hung Hwang**, "On Multicast Routing in Single Rate Loss Networks," *Journal of Information Science and Engineering*., Vol. 13, No. 3, September 1997, pp.461-474.
5. **Ren-Hung Hwang**, and Youn-Chen Sun, "Optimal Video Placement for Hierarchical Video-on-Demand Systems," *IEEE Transactions on Broadcasting*, Vol. 44, No. 4, Dec. 1998, pp.392-401.
6. **Ren-Hung Hwang**, "A Hierarchical Video-On-Demand System on ATM Networks," *Proceedings of the NSC, Part A: Physical Science and Engineering*, Vol. 23, No. 3, May 1999.
7. **Ren-Hung Hwang**, J. F. Kurose, and D. Towsley, "MDP Routing for Multirate Loss Networks," *Computer Networks*, Vol. 34, pp. 241-261, 1999.
8. **Ren-Hung Hwang**, "Adaptive Multicast Routing in Multirate Loss Networks," *Telecommunication Systems*, Vol. 12, pp.283-313, 1999.
9. **Ren-Hung Hwang**, and Pao-Ta Yu, "PROMS: A PRO-active Monitoring System for SS7 Networks," *International Journal of Network Management*, Vol. 10, No. 1, pp.17-27, 2000.
10. Jang-Jiin Wu, **Ren-Hung Hwang** and Hsueh-I Lu, "Multicast Routing with Multiple QoS Constraints in ATM Networks," *Information Sciences: an International Journal*, Vol. 124, pp. 29-57, 2000.
11. **Ren-Hung Hwang**, Wei-Yuan Do, and Shyi-Chang Yang, "Multicast Routing Based on Genetic Algorithms," *Journal of Information Science and Engineering*, Dec. 2000.
12. Huang-Leng Chang and **Ren-Hung Hwang**, "On LLR Routing in Circuit-Switched Networks," *IEICE Transactions on Communications*, Vol. E84-B, No. 5, May 2001, pp. 1397-1405.
13. Ben-Jye Chang and **Ren-Hung Hwang**, "Efficient Hierarchical QoS Routing in ATM Networks," *Computer Communications*, Vol. 24, No. 15-16, September 2001, pp. 1650-1662.
14. Ying-Dar Lin, Nai-Bin Hsu, **Ren-Hung Hwang**, "Granularity of QoS Routing in MPLS Networks," *Lecture Notes in Computer Science*, Vol. 2092 (Proceedings of IWQoS 2001), pp. 140-154, Springer, June 2001.

15. **Ren-Hung Hwang** and Pin-Hao Chi, "Fast Optimal Video Placement Algorithms for Hierarchical Video-On-Demand Systems," *IEEE Transactions on Broadcasting*, Vol. 47, Issue:4, Dec. 2001, pp. 357 –366.
16. Ben-Jye Chang, Hsien-Kang Chung, and **Ren-Hung Hwang**, "Reducing Overhead of Aggregated Information in Hierarchical Routing," *Computer Communications*, Vol. 25, Issue 5, March 2002, pp.534-543.
17. Ying-Dar Lin, Nai-Bin Hsu, and **Ren-Hung Hwang**, 2002, "QoS Routing Granularity in MPLS Networks," *IEEE Communication Magazine*, Vol. 40, No. 6, June 2002, pp. 58-65. (SCI, EI)
18. Jimmy Yang and **Ren-Hung Hwang**, 2002, "Performance of RSVP Controlled-Load Service over ATM ABR Service," *Journal of the Chinese Institute of Electrical Engineering*, Vol. 9, No. 4, 2002. (EI)
19. Ying-Dar Lin, Nai-Bin Hsu, **Ren-Hung Hwang**, 2002," RPIM-SM: Extending PIM-SM for RP Relocation," *Computer Communications*, Volume 25, Issue 18-1, December 2002, pp. 1774-1781. (SCI, EI)
20. Ching-Lin Wang, **Ren-Hung Hwang**, Tung-Shou Chen, and Huan-Ching Wang, "A Digital Image Watermarking System Based Upon Classification," *Imaging Science Journal* Vol 51, 2003, pp. 213-219. (SCI)
21. Ben-Jye Chang and **Ren-Hung Hwang**, 2003, "Analysis of Adaptive Cost Functions for Dynamic Update Policies for QoS Routing in Hierarchical Networks," *Information Sciences*, Volume 151, May 2003, pp. 1-26. (SCI, EI)
22. Heng-Chi Su and **Ren-Hung Hwang**, 2003, "Multicast Provision in a Differentiated Services Network," *Journal of Information Science and Engineering*, July 2003. (SCI, EI)
23. Ben-Jye Chang and **Ren-Hung Hwang**, 2004, "Distributed Cost-based Update Policies for QoS Routing on Hierarchical Networks," *Information Sciences*, Volume 159, Issues 1-2, Pages 87-108, January 2004. (SCI, EI)
24. Ben-Jye Chang and **Ren-Hung Hwang**, 2004, "Performance Analysis for Hierarchical Multirate Loss Networks," *IEEE Transactions on Networking*, Vol. 12, No. 1, Feb. 2004, pp. 187-199. (SCI, EI)
25. **Ren-Hung Hwang**, Ben-Jye Chang, Wen-Cheng Hsiao, and Jenq-Muh Hsu, "Scalable Distributed Multicast Routing with Multiple Classes of QoS Guarantee," *IEICE Transactions on Communications*, Vol.E 87-B, No.9, pp. 2682-2691, Sep. 2004. (SCI, EI)
26. Min-Xiou Chen, and **Ren-Hung Hwang**, "Fair and Efficient Packet Scheduling Algorithms for Multiple Classes of Service under QoS guarantee in UMTS," *Computer Communications*, Vol 28, No. 4, April 2005, pp. 379-392. (SCI, EI)

27. Min-Xiou Chen and **Ren-Hung Hwang**, "Fair and Efficient Scheduling for UMTS Forward Link," *International Journal of Communication Systems*, Vol. 18, No. 4 , pp. 409-426, 2005. (SCI)
28. Shao-Ming Lu, Min-Xiou Chen, and **Ren-Hung Hwang**, "Novel Location Management in IP-Based Cellular Networks," *International Journal of Mobile Communications*, Vol. 3, No. 2, pp. 150-164, 2005. (EI)
29. Ben-Jye Chang, Min-Xiou Chen, **Ren-Hung Hwang**, and Jun-Fan Juang, "MDP-based OVSF Code Assignment Scheme and Call Admission Control for Wideband-CDMA Communications," *Wireless Personal Communications*, Vol. 34, No.4, pp. 373-394, Sep. 2005. (SCI, EI)
30. **Ren-Hung Hwang**, Chiung-Ying Wang, Cheng-Ying Li, and Yuh-Shyan Chen, "Mobile IPv6-based Ad Hoc Networks: Its Development and Application," *IEEE Journal on Selected Area in Communications (JSAC)*, Vol. 23(11), Nov. 2005, pp. 2161- 2171. (SCI,EI)
31. Ben-Jye Chang and **Ren-Hung Hwang**, "Modeling and Analyzing the Performance of Adaptive Hierarchical Networks," *Information Sciences*, Vol. 176, Issue 5, pp. 522-549, March 6, 2006. (SCI,EI)
32. Min-Xiou Chen, and **Ren-Hung Hwang**, "Efficient OVSF code assignment and reassignment strategies in UMTS," *IEEE Transactions on Mobile Computing*, Vol. 5, No. 7, pp. 769-783, 2006.
33. Ching-Lin Wang, Yung-Kuan Chan, Sheng-Chu Wu, and **Ren-Hung Hwang**, "A Quadtree and Statistical Model Based Lossless Binary Image Compression Method," *Image Science Journal*, Vol. 69, No. 3, 2006, pp. 251-358. (SCI)
34. De-Kai Liu and **Ren-Hung Hwang**, "P2broadcast: a Hierarchical Clustering Live Video Streaming System for P2P Networks," *International Journal of Communication Systems*, Vol. 19(6), August 2006, pp. 619-637. (SCI)
35. Yuh-Shyan Chen, Yun-Hsuan Yang, and **Ren-Hung Hwang**, "SIP-based MIP6-MANET: Design and Implementation of Mobile IPv6 and SIP-based Mobile Ad Hoc Networks," *Computer Communications*, Vol. 29(8), May 2006, pp. 1226-1240. (SCI)
36. Ben-Jye Chang, Min-Xiou Chen, **Ren-Hung Hwang** and Kun-Chan Tsai, "Single Code-Based Dynamic Grouping with Cycle Interleaving Algorithm for Reducing Waste Rate in WCDMA Cellular Networks," *IEICE Transactions on Communications*, Vol. E89-B, No. 12, Dec. 2006, pp. 3306-3318. (SCI)
37. Chi-Jen Wu, De-Kai Liu and **Ren-Hung Hwang**, "A Location-Aware Peer-to-Peer Overlay Network," *International Journal of Communication Systems*, Vol. 20(1), Jan.

- 2007, pp. 83-102. (SCI)
38. De-Kai Liu, Chaiporn Jaikaeo, Chien-Chung Shen and **Ren-Hung Hwang**, "Querying time indexed information in mobile Ad hoc networks," Elsevier Ad Hoc Networks Journal, Volume 5, Issue 7, September 2007, pp. 1090-1112.
 39. **Ren-Hung Hwang**, Min-Xiou Chen, and Chen-Jui Peng, "SSIP: Split a SIP Session over Multiple Devices," Computer Standards & Interfaces, 29 (5), JUL 2007, pp. 531-545. (SCI)
 40. **Ren-Hung Hwang**, Chiung-Ying Wang, and Guan-Nan Chen, "MTSP: Multi-hop Time Synchronization Protocol for IEEE 802.11 Wireless Ad Hoc Network", Journal of Information Science and Engineering (JISE), 23 (4), JUL 2007, pp. 969-983. (SCI)
 41. **Ren-Hung Hwang**, Shan-Yi Tsai and Chiung-Ying Wang, "UbiPhone: Human-centered Ubiquitous Phone System," *IEEE Pervasive Computing*, vol. 8, no. 2, pp.40-47, April-June 2009. (SCI)
 42. De-Kai Liu, Chaiporn Jaikaeo, Chien-Chung Shen, and **Ren-Hung Hwang**, "Timely Information Discovery in MANETs," Computers and Mathematics with Applications, Vol. 57, No. 11-12, June 2009, pp. 1808-1821. (SCI impact factor =1.192)
 43. **Ren-Hung Hwang** and Cheng-Chang Hoh, "Cross-Layer Design of P2P File Sharing over Mobile Ad Hoc Networks," Telecommunication Systems, Vol. 42, Issue 1, 2009, Page 47. (SCI impact factor =0.286)
 44. **Ren-Hung Hwang**, Cheng-Chang Hoh, and Chiung-Ying Wang, "Swarm Intelligence based Anycast Routing Protocol in Ubiquitous Networks," Wireless Communications and Mobile Computing, Volume 10, Issue 7, pages 875-887, July 2010. (SCI impact factor =1.106)
 45. Chiung-Ying Wang, **Ren-Hung Hwang***, and Chuan-Kang Ting, "UbiPaPaGo: Context-aware Path Planning," Expert Systems With Applications, Vol. 38(4), April 2011, pp. 4150-4161. (SCI)
 46. Hsiao-Yun Huang, Chiung-Ying Wang, and **Ren-Hung Hwang***, "Mobility Management in Ubiquitous Environments," Journal of Personal and Ubiquitous Computing, special issue on Context-Aware Middleware and Applications, Volume 15, Issue 3, 2011, pp. 235-251. (SCI)
 47. Kuan-Lin Chiu, **Ren-Hung Hwang**, and Yuh-Shyan Chen, "Seamless Session Mobility Scheme in Heterogeneous Wireless Networks," International Journal of Communication Systems, Volume 24, Issue 6, June 2011, pp. 789-809. (SCI)
 48. Kuan-Lin Chiu, **Ren-Hung Hwang**, and Yuh-Shyan Chen, "Cross-layer design vehicle-aided handover scheme in VANETs," Wireless Communications and Mobile

- Computing, Volume 11 Issue 7, July 2011, pp. 916-928. (SCI)
49. Hung-Yi Teng, Hui-Ching Huang, and **Ren-Hung Hwang**, "Peer-to-Peer Video-on-Demand Service in NUWeb," *International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC)*, special issue on Cloud Computing - Technologies and Services, Vol. 9, No. 1, January, 2012, pp.1-11. (SCI, IF=0.848, 47/79)
 50. Yu-Chien Chen, **Ren-Hung Hwang***, Cheng-Yu Wang, "Development And Evaluation Of A Web 2.0 Annotation System As A Learning Tool In An E-Learning Environment," *Computer & Education*, vol. 58, 2012, pp.1094-1105. (SSCI , IF=2.621, 7/206)
 51. **Ren-Hung Hwang**, Jun-Hong Lu, and Chiung-Ying Wang "Open Framework for Distributed Context Management in Ubiquitous Environments," *International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC)*, Volume 9, Issue 4, April, 2012. (SCI , IF=0.848, 47/79)
 52. Kuan-Lin Chiu and **Ren-Hung Hwang**, "Communication Framework for Vehicle Ad Hoc Network on Freeways," *Telecommunication Systems*, August 2012, Volume 50, Issue 4, pp 243-256. (SCI, IF=0.689, 51/79)
 53. **Ren-Hung Hwang**, Ben-Jye Chang, Yan-Min Lin and Ying-Hsin Liang, "Adaptive Load-balancing Association Handoff Approach for Increasing Utilization and Improving GoS in Mobile WiMAX Networks," *Wireless Communications and Mobile Computing*, Vol. 12(4), October 2012, pp. 1251-1265. (SCI, IF=0.884, 43/79)
 54. Hung-Yi Teng, Chung-Chih Kuo, and **Ren-Hung Hwang**, " Downlink Packet Scheduling and Resource Allocation in EPON-WiMAX Hybrid Access Networks," *EURASIP Journal on Wireless Communications and Networking*, November 2012. (SCI, IF=0.873, 46/79) (doi:10.1186/1687-1499-2012-333, <http://jwcn.eurasipjournals.com/content/2012/1/333>)
 55. Hung-Yi Teng, Hung-Chi Lai and **Ren-Hung Hwang**, "Energy Efficiency Power Control of Cell Breathing in EPON-WiMAX Hybrid Access Network," *Journal of Interconnection Networks*, Vol. 13, Nos. 3&4, 2012, pp. 1250012-1 - 1250012-24.
 56. **Ren-Hung Hwang**, Chiung-Ying Wang, Chi-Jen Wu, and Guan-Nan Chen, "A Novel Efficient Power-Saving MAC Protocol for Multi-Hop MANETs," *International Journal of Communication Systems*, January 2013, Volume 26, Issue 1, pp. 34-55. (SCI)
 57. Yuan-Hao Chang, Ming-Chang Yang, Tei-Wei Kuo, and **Ren-Hung Hwang**, "A Reliability Enhancement Design under the Flash Translation Layer for Flash-Memory Storage Systems," *ACM Transactions on Embedded Computing Systems (TECS)*, Vol. 13, Issue 1, August 2013. (SCI)
 58. Hung-Yi Teng, Chien-Nan Lin, and **Ren-Hung Hwang***, "A Self-Similar Super-Peer

- Overlay Construction Scheme for Super Large-Scale P2P Application," *Information Systems Frontiers*, Vol. 16, No. 1, March 2014, pp 45-58. (SCI)
59. **Ren-Hung Hwang**, Yu-Ling Hsueh, and Hao-Wei Chung, "A Novel Time-Obfuscated Algorithm for Trajectory Privacy Protection," *IEEE Transactions on Services Computing*, Vol. 7, Issue 2, pp. 126-139, Apr.-June 2014. (SCI)
60. Da-Jing Zhang-Jiana, Chung-Nan Leea, and **Ren-Hung Hwang**, "An Energy Saving Algorithm for Cloud Resource Management Using a Kalman Filter," *International Journal of Communication Systems*, Vol. 27, Issue 12, pp. 4078-4091, Dec. 2014. (SCI)
61. **Ren-Hung Hwang**, Chung-Nan Lee, Yi-Ru Chen, and Da-Jing Zhang-Jian, "Cost Optimization of Elasticity Cloud Resource Subscription Policy," *IEEE Transactions on Services Computing*, Vol. 7, Issue 4, pp. 561-574, Oct.-Dec. 2014. (SCI)
62. Chin-Feng Lai, **Ren-Hung Hwang**, Han-Chieh Chao, Mohammad Mehedi Hassan, "A Buffer-Aware HTTP Live Streaming Approach for SDN-enabled 5G Wireless Networks," *IEEE Network Magazine*, Vol. 29, Issue 1, pp. 49-55, Jan.-Feb. 2015. (SCI)
63. **Ren-Hung Hwang**, Chi-Fu Huang, Cheng-Hsien Lin, and Chih-Yang Chung, "Context-Aware Multimedia Broadcast and Multicast Service Area Planning in 4G Networks," *Computer Communications*, Vol. 64, pp. 33-43, June 2015.
64. **Ren-Hung Hwang**, Yuling Hsueh, Yu-Ting Chen, "An Effective Taxi Recommender System Based on a Spatio-temporal Factor Analysis Model," *Information Sciences*, Vol. 314, Issue C, pp.28-40, Sep., 2015.
65. Cheng-Hsien Lin, **Ren-Hung Hwang**, Jang-Jiin Wu, Jeng-Farn Lee, and Ying-Dar Lin, "Integration of Spatial Reuse and Allocation for Downlink Broadcast in LTE-Advanced and WiMAX Relay Networks," *IEEE Transactions on Vehicular Technology*, Vol. 64, Issue 11, pp. 5246 - 5256, Nov., 2015.
66. Ying-Dar Lin, **Ren-Hung Hwang***, Raghavendra Kulkarni, Chinyang Henry Tseng, Chun-Hung Hsu, "On Campus IPv6 Beta Site: Requirements, Solutions, and Product Defect Evaluation," *Journal of Internet Technology*, Vol. 16, No. 7, pp. 1189-1199, Dec. 2015.
67. S.-Y. Chen, C.-F. Lai, **R.-H. Hwang**, Y.-H. Lai, M.-S. Wang, "An Adaptive Sensor Data Segments Selection Method for Wearable Health Care Services," *Journal of medical systems*, Vol. 39, Issue 12, pp. 1-11, Dec. 2015.
68. Cheng-Hsien Lin, **Ren-Hung Hwang***, Jeng-Farn Lee, Chuan-Kang Ting, "Relay-Aided Downlink Data Broadcast in LTE-Advanced or 802.16m WiMAX-Based Wireless Networks," *Journal of Internet Technology*, Vol. 17, No. 1, pp. 53-62, Jan. 2016.
69. **Ren-Hung Hwang**, Chi-Fu Huang, Huang-Wei Lin, Jang-Jiin Wu, "Uplink Access

- Control for Machine-Type Communications in LTE-A Networks," *Personal and Ubiquitous Computing*, 20(6), pp. 851-862, Nov. 2016.
70. **Ren-Hung Hwang**, Yu-Ling Hsueh, Jang-Jiin Wu, and Fu-Hui Huang, "SocialHide: A Generic Distributed Framework for Location Privacy Protection," *Journal of Network and Computer Applications*, Volume 76, pp. 87-100, Dec. 2016.
71. Chin-Feng Lai, **Ren-Hung Hwang**, and Han-Chieh Chao, "A QoS Aware Resource Allocation Strategy for Mobile Graphics Rendering with Cloud Support," *IEEE Transactions on Circuits and Systems for Video Technology*, Volume 27, No. 1, pp. 110-124, Jan. 2017.
72. **Ren-Hung Hwang**, Chih-Chiang Wang, and Wu-Bin Wang, "A Distributed Scheduling Algorithm for IEEE 802.15.4e Wireless Sensor Networks," *Computer Standards & Interfaces*, Volume 52, pp. 63-70, May 2017.
73. Chi-Fu Huang, Yuan-Feng Chan, and **Ren-Hung Hwang**, "A Comprehensive Real-Time Traffic Map for Geographic Routing in VANETs," *Applied Sciences*, Jan. 2017. (open access: <http://www.mdpi.com/2076-3417/7/2/129/pdf>)
74. Chin-Feng Lai, **Ren-Hung Hwang**, and Ying-Hsun Lai, "An Intelligent Body Posture Analysis Model Using Multi-Sensors for Long-Term Physical Rehabilitation," *Journal of medical systems*, Vol. 41, Issue 4, Apr. 2017. <https://doi.org/10.1007/s10916-017-0708-5>.
75. Van Linh Nguyen, Po-Ching Lin, **Ren-Hung Hwang**, "MECPASS: Denial of service defense architecture for mobile networks," *IEEE Network Magazine*, Vol. 32(1), Jan. 2018, pp. 118-124.
76. Chin-Feng Lai, Shih-Yeh Chen, and **Ren-Hung Hwang**, "A Resilient Power Fingerprinting Selection Mechanism of Device Load Recognition for Trusted Industrial Internet of Things," *IEEE Transactions on Industrial Informatics*, Vol. 14(8), Aug. 2018, pp. 3581 - 3589.
77. Chih-Chiang Wang, Ying-Dar Lin, Jang-Jiin Wu, Po-Ching Lin, **Ren-Hung Hwang**, "Towards Optimal Resource Allocation of Virtualized Network Functions for Hierarchical Datacenters," *IEEE Transactions on Network and Service Management*, Vol. 15(4), Dec. 2018, pp. 1532-1544.
78. **Ren-Hung Hwang**, Yu-Ling Hsueh, Yu-Ting Chang, "Building A Taiwan Law Ontology Based on Automatic Legal Definition Extraction," *Applied System Innovation*, June 2018.
79. Hsin-Tung Lin, **Ren-Hung Hwang***, Chih-Yuan Sun, Jang-Jiin Wu, "Improving Learning Achievement in Science Education for Elementary School Students via Blended Learning," *International Journal of Online Pedagogy and Course Design (IJOPCD)*, vol. 9(2), Mar. 2019. DOI: 10.4018/IJOPCD.2019040104

80. Ben-Jye Chang, **Ren-Hung Hwang***, Yueh-Lin Tsai, Bo-Han Yu, and Ying-Hsin Liang, "Cooperative Adaptive Driving for Platooning Autonomous Self Driving based on Edge Computing," *International Journal of Applied Mathematics & Computer Science*, Vol. 29(2), June 2019, pp. 213–225. (2018 IF: 1.504)
81. Yi-Hsuan Hung, Chih-Yu Wang, and **Ren-Hung Hwang**, "Optimizing Social Welfare of Live Video Streaming Services in Mobile Edge Computing," *IEEE Transactions on Mobile Computing*, accepted, Feb. 2019.
82. Van-Linh Nguyen, Po-Ching Lin, and **Ren-Hung Hwang**, "The Web Attacks: to beat monetization attempts," *Network Security*, vol. 2019(5), Apr. 2019, pp. 11-19.
83. Van-Linh Nguyen, Po-Ching Lin, and **Ren-Hung Hwang**, "Energy depletion attacks in Low Power Wireless networks," *IEEE Access*, Vol. 7, April, 2019, pp.51915-51932. (Digital Object Identifier: 10.1109/ACCESS.2019.2911424)
84. **Ren-Hung Hwang**, Min-Chun Peng, Cheng-Yu Wu, Satheesh Abimannan, "A Novel RPL-based Multicast Routing Mechanism for Wireless Sensor Networks," *International Journal of Ad Hoc and Ubiquitous Computing*, accepted, June 2019.
85. Van-Linh Nguyen, Po-Ching Lin, and **Ren-Hung Hwang**, "Multi-array relative positioning for verifying the truthfulness of V2X messages," *IEEE Communications Letters*, Vol. 23(10), Oct. 2019, pp. 1704 - 1707.
86. **Ren-Hung Hwang**, Min-Chun Peng, Kai-Chung Cheng, "QoS-Guaranteed Radio Resource Management in LTE-A Co-channel Networks with Dual Connectivity," *Applied Sciences*, July 2019. (open access: <https://www.mdpi.com/2076-3417/9/15/3018/pdf>)
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 116. W.-P. Wang and R.-H. Hwang, "A Distributed Scheduling Algorithm for IEEE 802.15.4e Networks," 2015 IEEE International Conference on Smart City (SmartCity 2015), Chengdu, China, Dec. 19-21, 2015.
 117. Chin-Feng Lai, Dong-Yu Song, Ren-Hung Hwang, and Ying-Xun Lai, "A QoS-aware HTTP Streaming Service over Fog Computing Infrastructures," 1st Digital Media Industry & Academic Forum, Santorini, Greece, 4-6 July 2016.
 118. Chih-Hao Chen, Ren-Hung Hwang, Chin-Feng Lai and Amy Shee, "Automatic Keyword Extraction Based on Taiwan Laws," the 9th International Conference on Ubi-Media Computing (UMEDIA 2016), Moscow, Russia, August 15-17, 2016.
 119. Ren-Hung Hwang, Jang-Jiin Wu, Pao-Ann Hsiung, and Chin-Feng Lai, "Design and Implementation of a Learning Platform for a Computer Science Capstone Course based on Project-based Learning and Creative Thinking," SEFI Annual Conference 2016, Tampere, Finland, September 12-15, 2016.
 120. Pao-Ann Hsiung, Ren-Hung Hwang, and Yau-Jane Chen, "Introducing Creativity into Engineering Capstone Courses," SEFI Annual Conference 2016, Tampere, Finland, September 12-15, 2016.
 121. Chin-Feng Lai, Chun-Wei Tsai, Ren-Hung Hwang, Chu-Sing Yang, and Dong-Yu Song, "An Intelligent Concept Map for e-Book via Automatic Keyword Extraction," 1st International Symposium on Emerging Technologies for Education (SETE 2016), Roma, Italy, Oct 26-29, 2016.
 122. Jui-Hung Chang, Chien-Yuan Tseng, and Ren-Hung Hwang, "Construction of Efficient Cloud-Based Digital Course Learning Platform for Agricultural Worker," 1st International Symposium on Emerging Technologies for Education (SETE 2016), Roma, Italy, Oct. 26-29, 2016.
 123. Ren-Hung Hwang, "SDN-enabled Cloud Data Center," Workshop on Internet

- Architecture and Applications 2016 (IA 2016), Taipei, Taiwan, Nov. 3-4, 2016. (invited talk)
124. Sing-Chi Chen and Ren-Hung Hwang, "A Scalable Integrated SDN and OpenStack Management System," 2016 IEEE International Symposium on Cloud and Services Computing (IEEE SC2 2016), Fiji, Dec. 7-10, 2016.
 125. Ren-Hung Hwang and Yu-Chi Tang, "Fast Failover Mechanism for SDN-enabled Data Centers," International Computer Symposium 2016, Chiayi, Taiwan, Dec. 15-17.
 126. Ren-Hung Hwang and Hui-Ping Tseng, "Load Balancing and Routing Mechanism based on Software Defined Network in Data Centers," International Computer Symposium 2016, Chiayi, Taiwan, Dec. 15-17.
 127. Ren-Hung Hwang, "SDN-enabled Cloud Data Center," distinguished speech at the 3rd International Conference on Cloud Computing and Security (ICCCS 2017), Nanjing, China, Jun 16-18, 2017.
 128. Po-Ching Lin, Yu-Ting Hsu, and Ren-Hung Hwang, "Detecting and Preventing DDoS Attacks in SDN-based Data Center Networks," the 3rd International Conference on Cloud Computing and Security (ICCCS 2017), Nanjing, China, Jun 16-18, 2017.
 129. Ren-Hung Hwang, Kai-Chung Cheng, "Novel QoS Guaranteed Cell Selection Schemes in LTE-A Heterogeneous Networks," Ubi-Media 2017, Pattaya, Thailand, August 1-4, 2017.
 130. Ren-Hung Hwang, Pao-Ann Hsiung, Y. J. Chen, and Chin-Fon Lai, "Innovative Project-Based Learning," 2nd International Symposium on Emerging Technologies for Education (SETE 2017), Sep. 20-22, 2017, Cape Town, South Africa.
 131. Jui-Hung Chang, Ren-Hung Hwang and Hung-Hsi Chiang, "Satisfaction Analysis for Agricultural Worker Digital Course Learning Platform," 2nd International Symposium on Emerging Technologies for Education (SETE 2017), Sep. 20-22, 2017, Cape Town, South Africa.
 132. Shih-Yeh Chen, Chin-Feng Lai, Ren-Hung Hwang, Chu-Sing Yang and Ming-Shi Wang, "Inference of Learning Creative Characteristics by Analysis of EEG Signal," International Workshop on Smart Learning by Emerging Educational Paradigm (SLEEP 2017), Sep. 20-22, 2017, Cape Town, South Africa.
 133. Ren-Hung Hwang, Ben-Jye Chang, Yueh-Lin Tsai, and Ying-Hsin Liang, "Mobile Edge Computing-based Vehicular Cloud of Cooperative Adaptive Driving for Platooning Autonomous Self Driving Coefficient," 2017 IEEE International Symposium on Cloud and

- Services Computing (IEEE SC2 2017), Kanazawa, Japan, Nov. 22-25, 2017. (**Best Paper Award**)
134. Jui-Hung Chang, Chien-Yuan Tseng, Ren-Hung Hwang and Mi-Chia Ma, "Using ANN to Analyze the Correlation between Tourism-related Hot Words and Number of Tourists - a Case Study on Japan," 2017 IEEE International Symposium on Cloud and Services Computing (IEEE SC2 2017), Kanazawa, Japan, Nov. 22-25, 2017.
135. Jui-Hung Chang, Chien-Yuan Tseng, Hung-Hsi Chiang and Ren-Hung Hwang, "Analysis of Influential Factors in Secondary PM2.5 by K-medoids and Correlation Coefficient," 2017 IEEE International Symposium on Cloud and Services Computing (IEEE SC2 2017), Kanazawa, Japan, Nov. 22-25, 2017.
136. Ren-Hung Hwang, Yu-Ling Hsueh, and Yu-Ting Chang, "Building A Law Ontology Based on Automatic Legal Definition Extraction", 2018 IEEE International Conference on Applied System Innovation, April 13-17, 2018, Chiba, Tokyo, Japan.
137. Yi-Hsuan Hung, Chih-Yu Wang, and Ren-Hung Hwang, "Combinatorial Clock Auction for Live Video Streaming in Mobile Edge Computing," INFOCOM 2018 workshop on Integrating Edge Computing, Caching, and Offloading in Next Generation Networks (IECCO 2018), April 16-20, 2018, Honolulu, Hawaii, USA.
138. Yi-Jhong Gong, Kai-Hsiang Lin, Jui-Hung Chang and Ren-Hung Hwang, "Applying Classification to Rainfall Nowcasting with Topographical Awareness," the First International Cognitive Cities Conference (IC3), August 7-9, Okinawa, Japan, 2018. (**Best Paper Award**)
139. Hung-Yi Teng, Ying-Dar Lin, Jen-Yeu Chen and Ren-Hung Hwang, "Performance Analysis of Relay-assisted Heterogeneous Cellular Networks," IEEE Ubi-Media 2018, Nanjing, China, August 22-25, 2018. (**Best Paper Award**)
140. Ren-Hung Hwang, Van-Linh Nguyen, Po-Ching Lin, "StateFit: Security framework for SDN programmable dataplane model," the 15th International Symposium on Pervasive Systems, Algorithms, and Networks (IEEE I-SPAN 2018), Yi-Chang, China, Oct. 16-19, 2018.
141. Yin Chung Leung, Jui-Hung Chang and Ren-Hung Hwang, "A Survey and Implementation on Neural Network Visualization," the 15th International Symposium on Pervasive Systems, Algorithms, and Networks (IEEE I-SPAN 2018), Yi-Chang, China, Oct. 16-19, 2018.
142. Ren-Hung Hwang, "Optimal Resource Management of Live Video Streaming Service in Mobile Networks with Mobile Edge Computing," invited talk at 2019 International

- Conference for Leading and Young Computer Scientists (ICLYCS 2019), Okinawa, Japan, Feb. 28-Mar. 3, 2019.
143. Ren-Hung Hwang, Min-Chun Peng and Yu-Lun Chang, "Malware Traffic Classification Using Long Short-Term Memory Network," 2019 IEEE International Conference on Applied System Innovation, Fukuoka, Japan, April 11-15, 2019.
 144. Ren-Hung Hwang, Yung-Cheng Lai and Ying-Dar Lin, "Offloading Optimization with Delay Distribution in the 3-tier Federated Cloud, Edge, and Fog Systems," IEEE International Symposium on Cloud and Services Computing (IEEE SC2 2019), Kao-Hsiung, Taiwan, Nov. 18-21, 2019.
 145. Ren-Hung Hwang, Min-Chun Peng and Bo-Hao Tu, "Uplink Access Control in Narrowband IoT," The 6th International Conference on Internet of Vehicles, Kao-Hsiung, Taiwan, Nov. 18-21, 2019. **(Best Paper Award)**
 146. Van-Linh Nguyen, Po-Ching Lin and Ren-Hung Hwang, "Physical signal-driven fusion for V2X misbehavior detection," 2019 IEEE Vehicular Networking Conference (VNC), Los Angeles, California, USA, December 4 -6, 2019.
 147. Ren-Hung Hwang, Min-Chun Peng and Chien-Wei Huang, "Detecting IoT Malicious Traffic based on Autoencoder and Convolutional Neural Network," 2019 IEEE Globecom IoTSEC Workshop, Waikoloa, Hawaii, USA, December 9 -13, 2019.
 148. Wei-Yu Chen, Po-Yu Chou, Chih-Yu Wang, Ren-Hung Hwang and Wen-Tsuen Chen, "Live Video Streaming with Joint User Association and Caching Placement in Mobile Edge Computing," International Conference on Computing, Networking and Communications (ICNC 2020), Big Island, Hawaii, USA. February 17-20, 2020.
 149. Po-Yu Chou, Wei-Yu Chen, Chih-Yu Wang, Ren-Hung Hwang and Wen-Tsuen Chen, "Deep Reinforcement Learning for MEC Streaming with Joint User Association and Resource Management," IEEE International Conference on Communications (ICC 2020), June 7-11, 2020, Dublin, Ireland.
 150. Ren-Hung Hwang, Faysal Marzuk, Marek Sikora, Piotr Chołda, Ying-Dar Lin, "Resource Management in LADNs Supporting 5G V2X Communications," *IEEE 92nd Vehicular Technology Conference: VTC2020-Fall*, Nov. 18–Dec. 16 , 2020, virtual conference.
 151. Ren-Hung Hwang, Muktadirul Islam, Asif Tanvir, Shohrab Hossain and Ying-Dar Lin, "Communication and Computation Offloading for 5G V2X: Modeling and Optimization," 2020 IEEE Globecom, Taipei, Taiwan, Dec. 7-11, 2020.

152. Phi Le Nguyen, Ren-Hung Hwang, Pham Minh Khiem, Kien Nguyen and Ying-Dar Lin, "Modeling and Minimizing Latency in Three-tier V2X Networks," 2020 IEEE Globecom, Taipei, Taiwan, Dec. 7-11, 2020.
153. Y-H Ye, Z-Y Lin, C-C Yao, L-H Nguyen, J-J Kuo, R-H Hwang, "Efficient Multi-maneuver Platooning Framework for Autonomous Vehicles on Multi-lane Highways," 2021 IEEE VTC-Fall, Sep. 27-30, 2021.
154. R-H Hwang, V-L Nguyen, C-C Tsai, P-C Lin, "Platoon-based Vehicle Coordination Scheme for Resolving Sudden Traffic Jam in the IoV Era," 2021 IEEE VTC-Fall, Sep. 27-30, 2021.
155. Lan-Huong Nguyen, Ren-Hung Hwang, Po-Ching Lin, Van-Linh Nguyen, Jian-Jih Kuo, "Robust Positioning-based Verification Scheme for Enhancing Reliability of Vehicle Platoon Control," 2021 IEEE VTC-Fall, Sep. 27-30, 2021.
156. Haotian Zhang, Haorui Ji, Aotian Zheng, Ren-Hung Hwang and Jenq-Neng Hwang, "Monocular 3D Localization of Vehicles in Road Scenes," AVVision2021 workshop at ICCV 2021, Oct. 11-17, 2021.
157. Cheng-Wei Ching, Hung-Sheng Huang, Chun-An Yang, Jian-Jih Kuo, and Ren-Hung Hwang, "Efficient Online Decentralized Learning Framework for Social Internet of Things," 2021 IEEE Globecom, Madrid, Spain, Dec. 7-11, 2021.
158. Ren-Hung Hwang, Yuan-Cheng Lai, and Ying-Dar Lin, "Offloading Optimization with Delay Constraint in the 3-tier Federated Cloud, Edge, and Fog Systems," 2021 IEEE Globecom, Madrid, Spain, Dec. 7-11, 2021.

Books and Book Chapters

1. Ren-Hung Hwang and Chung-Ming Huang, Innovations 2004: World Innovations in Engineering Education and Research, chapter 7: An Innovative Teaching Program for Network Applications and Services, ed. by W. Aung, R. Altenkrich, T. Cermak, R. W. King, L. M. S. Ruiz, pp.63-71.
2. YingDar Lin, Ren-Hung Hwang and Fred Baker, Computer Networks: An Open Source Approach, Mc Graw Hill, Feb. 2011, ISBN 978-0-07-337624-0.

Patents

1. Scalable Techniques for Quality-of-Service Routing and Forwarding, R.O.C. patent number 152498, 2002/3/21-2020/6/14. (U.S.A. patent number 6,738,387) (with YD Lin and NB Hsu)

2. Virtual network environment for P2P on-line game in wireless mobile networks, Japan
Patent number 4219366, 2006.1.20-2026.1.20.

Keynote Speech

1. Keynote speaker, IEEE FCST2014/CSE2014/IUCC2014/I-SPAN2014

Program Committee Member, Program Chair, Session Chair

Dr. Hwang has served in several program committees of international conferences and workshops.

- **Directors Board, IEEE Tainan Section (2014-present)**
- **Editor: Journal of Information Science and Engineering (2009-present)**
- **Editor: Int. J. of Ad Hoc and Ubiquitous Computing (IJAHUC) (2017-present)**
- **Lead Guest Editor: Journal of Security and Communication Networks, special issue on "Security and Privacy in Mobile Applications and Platforms (SPMNA)."**
- **Guest Editor: IEEE Network, special issue on "Open Source for Networking: Development and Experimentation."**
- **Guest Editor: IET Communications, special issue on WiMAX Integrated Communications (2009)**
- **Program Vice Chair of the International Conference on Ubiquitous Intelligence and Computing, 2011.**
- **Program Chair of the 10th International Symposium on Pervasive Systems, Algorithms and Networks (I-SPAN 2009)**
- **Track Co-Chair of the Mobile Satellite & Positioning Systems Track for VTC 2010-Spring**
- **Technical Program committee (TPC):** Globecom 2005-2018, Symposium on Toward an Autonomic Internet, AINA 2005-2007, IEE mobility conference 2005, IEEE International Workshop on Pervasive Computing and Ad Hoc Communications (PCAC'06), The 2006 IFIP International Conference on Embedded And Ubiquitous Computing (EUC 2006), First International Conference on Communications and Networking in China - Advances in Internet (ChinaCom2006-2009), CloudCom 2009-2014, CPI 2009, WASN 2005-2009, IWCMC 2009, IEEE/IEICE/KICS APNOMS 2009,
- **General chair:** 2001 National Network and Communication Workshop, 2016 ICS, 2017 IEEE SC2, 2018 IEEE ISPAN, 2019 IEEE DataCom.
- **Invited Tutorial:** Workshop on Distributed System Technologies & Applications, 1999.

Professional Memberships

IEEE (The Institute of Electrical and Electronics Engineers)

Paper Refereeing

Dr. Hwang has been taking an active part in reviewing papers for international conferences and journals for quite a few years.

International Conferences

IEEE INFOCOM ,

IEEE GLOBECOM,

IEEE ICC,

ICOIN,

WCNC,

IWCMC,

International Conference on Real-Time Computing Systems and Applications (RTCSA),

International Computer Symposium,

ISMIP,

RAMS,

Wimob,

ChinaCom,

UIC,

EUC

International Journals

IEEE/ACM Transactions on Networking,

IEEE Network,

IEEE Computer,

IEEE Communications Magazine,

IEEE Transactions on Parallel and Distributed Systems,

IEEE Transactions on Computers,

IEEE Transactions on Broadcasting,

IEEE Transactions on Service Computing,

IEEE Transactions on Transactions on Learning Technologies,

IEEE MultiMedia,

IEEE Computational Intelligence Magazine,

Computer Communications,

Information Sciences,

Wireless Communications and Mobile Computing,

Journal of Information Science and Engineering,

Journal of the Chinese Institute of Engineers,
International Journal of Communication Systems,
Mobile Networks and Applications,
Computer&Education,
Educational Technology & Society journal,
Journal of Interactive Learning Environment
The Scientific World Journal