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RESEARCH

Cyber-Physical Systems, Connected and Autonomous Vehicles, Security, System Design Methodology, Model-Based Design

EDUCATION

Ph.D. (2015), Department of Electrical Engineering and Computer Sciences, University of California, Berkeley

- Advisor: Alberto L. Sangiovanni-Vincentelli
- GPA: 4.00/4.00

M.S. (2007), Graduate Institute of Electronics Engineering, National Taiwan University

- Advisor: Yao-Wen Chang
- GPA: 4.00/4.00 or 93.14 (100-point scale); Rank: 3rd (among 132 students)

B.S. (2005), Department of Computer Science and Information Engineering, National Taiwan University

- GPA: 4.00/4.00 or 92.02 (100-point scale); Rank: 2nd (among 108 students)

PUBLICATIONS

Journal Papers

1. S. Aoki, **C.-W. Lin**, and R. Rajkumar, “Human-robot cooperation for autonomous vehicles and human drivers: challenges and solutions,” accepted and to appear in *IEEE Communications Magazine* (COMMAG).
2. **C.-W. Lin**, B. Kim, and S. Shiraishi, “Hardware virtualization and task allocation for plug-and-play automotive systems,” accepted and to appear in *IEEE Design & Test* (D&T).
3. M. Sayin, **C.-W. Lin**, E. Kang, S. Shiraishi, and T. Başar, “Reliable smart road signs,” in *IEEE Transactions on Intelligent Transportation Systems* (T-ITS), vol. 21, no. 12, pp. 4995–5009, Dec. 2020.
4. H. Wang, T. Liu, B. Kim, **C.-W. Lin**, S. Shiraishi, J. Xie, and Z. Han, “Architectural design alternatives based on cloud/edge/fog computing for connected vehicles,” in *IEEE Communications Surveys & Tutorials* (COMST), vol. 22, no. 4, pp. 2349–2377, Fourth Quarter, 2020.
5. B. Zheng, **C.-W. Lin**, S. Shiraishi, and Q. Zhu, “Design and analysis of delay-tolerant intelligent intersection management,” in *ACM Transactions on Cyber-Physical Systems* (TCPS), vol. 4, no. 1, pp. 3:1–3:27, Nov. 2019.
6. Y.-T. Lin, H. Hsu, S.-C. Lin, **C.-W. Lin**, H.-R. Jiang, and C. Liu, “Graph-based modeling, scheduling, and verification for intersection management of intelligent vehicles,” in *ACM Transactions on Embedded Computing Systems* (TECS), vol. 18, no. 5s, pp. 95:1–95:21, Oct. 2019.
7. M. Sayin, **C.-W. Lin**, S. Shiraishi, J. Shen, and T. Başar, “Information-driven intersection control with incentive mechanism,” in *IEEE Transactions on Intelligent Transportation Systems* (T-ITS), vol. 20, no. 3, pp. 912–924, Mar. 2019.
8. C. Liu, **C.-W. Lin**, S. Shiraishi, and M. Tomizuka, “Distributed conflict resolution for connected autonomous vehicles,” in *IEEE Transactions on Intelligent Vehicles* (T-IV), vol. 3, no. 1, pp. 18–29, Mar. 2018.
9. T.-Y. Huang, C.-J. Chang, **C.-W. Lin**, S. Roy, and T.-Y. Ho, “Delay-bounded intra-vehicle network routing algorithm for minimization of wiring weight and wireless transmit power,” in *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* (TCAD), vol. 36, no. 4, pp. 551–561, Apr. 2017.

10. H. Yu, **C.-W. Lin**, and B. Kim, “Automotive software certification: current status and challenges,” in *SAE International Journal of Passenger Cars—Electronic and Electrical Systems*, vol. 9, no. 1, pp. 74–80, May. 2016.
11. **C.-W. Lin**, B. Zheng, Q. Zhu, and A. Sangiovanni-Vincentelli, “Security-aware design methodology and optimization for automotive systems,” in *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, vol. 21, no. 1, pp. 18:1–18:26, Dec. 2015. **(2016 Best Paper Award)**
12. **C.-W. Lin**, L. Rao, P. Giusto, J. D’Ambrosio, and A. Sangiovanni-Vincentelli, “Efficient wire routing and wire sizing for weight minimization of automotive systems,” in *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 34, no. 11, pp. 1730–1741, Nov. 2015.
13. **C.-W. Lin**, Q. Zhu, and A. Sangiovanni-Vincentelli, “Security-aware modeling and efficient mapping for CAN-based real-time distributed automotive systems,” in *IEEE Embedded Systems Letters (ESL)*, vol. 7, no. 1, pp. 11–14, Mar. 2015. **(2015 Most Accessed ESL Paper)**
14. **C.-W. Lin**, L. Rao, J. D’Ambrosio, and A. Sangiovanni-Vincentelli, “Electrical architecture optimization and selection—cost minimization via wire routing and wire sizing,” in *SAE International Journal of Passenger Cars—Electronic and Electrical Systems*, vol. 7, no. 2, pp. 502–509, Aug. 2014.
15. **C.-W. Lin** and A. Sangiovanni-Vincentelli, “Cyber-security for the Controller Area Network (CAN) communication protocol,” in *ASE Science Journal*, vol. 1, no. 2, pp. 80–92, Dec. 2012.
16. **C.-W. Lin**, P.-W. Lee, Y.-W. Chang, C.-F. Shen, and W.-C. Tseng, “An efficient pre-assignment routing algorithm for flip-chip designs,” in *IEEE Transactions Computer-Aided Design (TCAD)*, Vol. 31, No. 6, pp. 878–889, Jun. 2012.
17. **C.-W. Lin**, S.-L. Huang, K.-C. Hsu, M.-X. Lee, and Y.-W. Chang, “Multi-layer obstacle-avoiding rectilinear Steiner tree construction based on spanning graphs,” in *IEEE Transactions Computer-Aided Design (TCAD)*, Vol. 27, No. 11, pp. 2007–2016, Nov. 2008.
18. C.-H. Liu, H.-Y. Liu, **C.-W. Lin**, S.-J. Chou, Y.-W. Chang, S.-Y. Kuo, and S.-Y. Yuan, “An efficient graph-based algorithm for ESD current path analysis,” in *IEEE Transactions Computer-Aided Design (TCAD)*, Vol. 27, No. 8, pp. 1363–1375, Aug. 2008.
19. **C.-W. Lin**, S.-Y. Chen, C.-F. Lee, Y.-W. Chang, and C.-L. Yang, “Obstacle-avoiding rectilinear Steiner tree construction based on spanning graphs,” in *IEEE Transactions Computer-Aided Design (TCAD)*, Vol. 27, No. 4, pp. 643–653, Apr. 2008.

Conference Papers

1. C.-S. Shih, **C.-W. Lin**, C.-W. Chen, and P.-K. Tsung, “Trajectory prediction at unsignalized intersections using social conditional generative adversarial network,” accepted and to appear in *IEEE International Conference on Intelligent Transportation Systems (ITSC)*, Indianapolis, IN, Sep. 2021.
2. S.-L. Wang, S.-Y. Wu, C.-C. Lin, S. Boddupalli, P.-J. Chang, **C.-W. Lin**, C.-S. Shih, and S. Ray, “Deep-learning-based intrusion detection for autonomous vehicle-following systems,” accepted and to appear in *IEEE International Conference on Intelligent Transportation Systems (ITSC)*, Indianapolis, IN, Sep. 2021.
3. P.-Y. Huang, C.-C. Kung, and **C.-W. Lin**, “An integrated formulation and optimization for periodic timetabling of railway systems,” accepted and to appear in *IEEE International Conference on Intelligent Transportation Systems (ITSC)*, Indianapolis, IN, Sep. 2021.
4. M. Khayatian, M. Mehrabian, H. Allamsetti, K.-W. Liu, P.-Y. Huang, **C.-W. Lin**, and A. Shrivastava, “Cooperative driving of connected autonomous vehicles using responsibility-sensitive safety (RSS) rules,” in *ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)*, pp. 11–20, Nashville (Virtual), TN, May. 2021.
5. C.-C. Fu, B.-H. Chia, **C.-W. Lin**, (Invited) “Runtime software selection for adaptive automotive systems,” in *ACM/IEEE Asia South Pacific Design Automation Conference (ASP-DAC)*, pp. 748–752, Tokyo (Virtual), Japan, Jan. 2021.
6. S.-C. Lin, H. Hsu, Y.-T. Lin, **C.-W. Lin**, H.-R. Jiang, and C. Liu, “A dynamic programming approach to optimal lane merging of connected and autonomous vehicles,” in *IEEE Intelligent Vehicles Symposium (IV)*, pp. 349–356, Las Vegas (Virtual), NV, Oct. 2020.
7. S.-L. Wu*, C.-Y. Bai*, K.-C. Chang, Y.-T. Hsieh, C. Huang, **C.-W. Lin**, E. Kang, and Q. Zhu, “Efficient system verification with multiple weakly-hard constraints for runtime monitoring,” in *International Conference on Runtime Verification (RV)*, pp. 497–516, Los Angeles (Virtual), CA, Oct. 2020.

8. C.-C. Chuang, T.-H. Yu, **C.-W. Lin**, A.-C. Pang, and T.-J. Hsieh, "Online stream-aware routing for TSN-based industrial control systems," in *IEEE International Conference on Emerging Technologies and Factory Automation (ETFA)*, pp. 254–261, Vienna (Hybrid), Austria, Sep. 2020.
9. C. Huang*, K.-C. Chang*, **C.-W. Lin**, and Q. Zhu, "SAW: a tool for safety analysis of weakly-hard systems," in *International Conference on Computer-Aided Verification (CAV)*, pp. 543–555, Los Angeles (Virtual), CA, Jul. 2020.
10. H. Liu, **C.-W. Lin**, E. Kang, S. Shiraishi, and D. Blough, "A Byzantine-tolerant distributed consensus algorithm for connected vehicles using proof-of-eligibility," in *ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM)*, pp. 225–234, Miami, FL, Nov. 2019.
11. Y.-T. Lin, H. Hsu, S.-C. Lin, **C.-W. Lin**, H.-R. Jiang, and C. Liu, "Graph-based modeling, scheduling, and verification for intersection management of intelligent vehicles," in *ACM International Conference on Embedded Software (EMSOFT)*, New York, NY, Oct. 2019. (**Journal-Track Paper to ACM TECS**)
12. T.-W. Huang, Y.-Y. Tsai, **C.-W. Lin**, and T.-Y. Ho, "Vehicle sequence reordering with cooperative adaptive cruise control," in *ACM/IEEE Design, Automation and Test in Europe Conference (DATE)*, pp. 610–613, Florence, Italy, Mar. 2019.
13. S. Raghavan, K. Watanabe, E. Kang, **C.-W. Lin**, Z. Jiang, and S. Shiraishi, "Property-driven runtime resolution of feature interactions," in *International Conference on Runtime Verification (RV)*, pp. 316–333, Limassol, Cyprus, Nov. 2018.
14. H. Liang, M. Jagielski, B. Zheng, **C.-W. Lin**, E. Kang, S. Shiraishi, C. Nita-Rotaru, and Q. Zhu, (Invited) "Network and system level security in connected vehicle applications," in *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, pp. 94:1–94:7, San Diego, CA, Nov. 2018.
15. B. Kim, **C.-W. Lin**, E. Kang, N. Tomatsu, and S. Shiraishi, "Platform-independent QoS parameters and primitive APIs for automotive software," in *IEEE International Conference on Intelligent Transportation Systems (ITSC)*, pp. 98–104, Maui, HI, Nov. 2018.
16. I. Incer, A. Sangiovanni-Vincentelli, **C.-W. Lin**, and E. Kang, "Quotient for assume-guarantee contracts," in *ACM/IEEE International Conference on Formal Methods and Models for System Design (MEMOCODE)*, pp. 67–77, Beijing, China, Oct. 2018.
17. T. Chowdhury, E. Lesiuta, K. Rikley, **C.-W. Lin**, E. Kang, B. Kim, S. Shiraishi, M. Lawford, and A. Wassylng, "Safe and secure automotive over the air updates," in *International Conference on Computer Safety, Reliability, and Security (SAFECOMP)*, pp. 172–187, Västerås, Sweden, Sep. 2018.
18. D. Gangadharan, O. Sokolsky, I. Lee, B. Kim, **C.-W. Lin**, and S. Shiraishi, "Bandwidth optimal data/service delivery for connected vehicles via edges," in *IEEE International Conference on Cloud Computing (CLOUD)*, pp. 106–113, San Francisco, CA, Jul. 2018.
19. M. Sayin, **C.-W. Lin**, S. Shiraishi, and T. Başar, "Reliable intersection control in non-cooperative environments," in *AACC/IEEE American Control Conference (ACC)*, pp. 609–614, Milwaukee, WI, Jun. 2018.
20. C. Liu, **C.-W. Lin**, S. Shiraishi, and M. Tomizuka, "Improving efficiency of autonomous vehicles by V2V communication," in *AACC/IEEE American Control Conference (ACC)*, pp. 4778–4783, Milwaukee, WI, Jun. 2018.
21. K. Watanabe, E. Kang, **C.-W. Lin**, and S. Shiraishi, (Invited) "Runtime monitoring for safety of intelligent vehicles," in *ACM/IEEE Design Automation Conference (DAC)*, pp. 31:1–31:6, San Francisco, CA, Jun. 2018.
22. M. Jagielski, N. Jones, **C.-W. Lin**, C. Nita-Rotaru, and S. Shiraishi, "Threat detection for collaborative adaptive cruise control in connected cars," in *ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec)*, pp. 184–189, Stockholm, Sweden, Jun. 2018.
23. B. Zheng, M. Sayin, **C.-W. Lin**, S. Shiraishi, and Q. Zhu, (Invited) "Timing and security analysis of VANET-based intelligent transportation systems," in *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, pp. 984–991, Irvine, CA, Nov. 2017.
24. W. Zuo, L.-N. Pouchet, A. Ayupov, T. Kim, **C.-W. Lin**, S. Shiraishi, and D. Chen, "Accurate high-level modeling and automated hardware/software co-design for effective SoC design space exploration," in *ACM/IEEE Design Automation Conference (DAC)*, pp. 78:1–78:6, Austin, TX, Jun. 2017.

25. B. Zheng, **C.-W. Lin**, H. Liang, S. Shiraishi, W. Li, and Q. Zhu, (Invited) “Delay-aware design, analysis and verification of intelligent intersection management,” in *IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 1–8, Hong Kong, China, May. 2017.
26. B. Aygun, **C.-W. Lin**, S. Shiraishi, and A. Wyglinski, “Selective message relaying for multi-hopping vehicular networks,” in *IEEE Vehicular Networking Conference (VNC)*, pp. 1–8, Columbus, OH, Dec. 2016.
27. B. Zheng, **C.-W. Lin**, H. Yu, H. Liang, and Q. Zhu, (Invited) “CONVINCE: A cross-layer modeling, exploration and validation framework for next-generation connected vehicles,” in *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, pp. 37:1–37:8, Austin, TX, Nov. 2016.
28. D. Gangadharan, O. Sokolsky, J. H. Kim, B. Kim, **C.-W. Lin**, S. Shiraishi, and I. Lee, (Invited) “Platform-based plug and play of automotive safety features—challenges and directions,” in *IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA)*, pp. 76–84, Daegu, Korea, Aug. 2016.
29. B. Zheng, H. Liang, Q. Zhu, H. Yu, and **C.-W. Lin**, (Invited) “Next generation automotive architecture modeling and exploration for autonomous driving,” in *IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, pp. 53–58, Pittsburgh, PA, Jul. 2016.
30. **C.-W. Lin** and H. Yu, (Invited) “Cooperation or competition? Coexistence of safety and security in next-generation Ethernet-based automotive networks,” in *ACM/IEEE Design Automation Conference (DAC)*, pp. 52:1–52:6, Austin, TX, Jun. 2016.
31. D. Gangadharan, O. Sokolsky, I. Lee, B. Kim, **C.-W. Lin**, and S. Shiraishi, “Platform-based automotive safety features,” in *SAE World Congress & Exhibition*, Detroit, MI, Apr. 2016.
32. H. Yu, **C.-W. Lin**, and B. Kim, “Automotive software certification: current status and challenges,” in *SAE World Congress & Exhibition*, Detroit, MI, Apr. 2016.
33. T.-Y. Huang, C.-J. Chang, **C.-W. Lin**, S. Roy, and T.-Y. Ho, “Intra-vehicle network routing algorithm for weight and wireless transmit power minimization,” in *ACM/IEEE Asia South Pacific Design Automation Conference (ASP-DAC)*, pp. 273–278, Chiba/Tokyo, Japan, Jan. 2015. (**Best Paper Nominee**)
34. **C.-W. Lin**, Q. Zhu, and A. Sangiovanni-Vincentelli, “Security-aware mapping for TDMA-based real-time distributed systems,” in *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, pp. 24–31, San Jose, CA, Nov. 2014.
35. **C.-W. Lin**, T.-H. Hsu, X.-W. Shih, and Y.-W. Chang, “Buffered clock tree synthesis considering self-heating effects,” in *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, pp. 111–116, La Jolla, CA, Aug. 2014.
36. **C.-W. Lin**, L. Rao, P. Giusto, J. D’Ambrosio, and A. Sangiovanni-Vincentelli, “An efficient wire routing and wire sizing algorithm for weight minimization of automotive systems,” in *ACM/IEEE Design Automation Conference (DAC)*, San Francisco, CA, Jun. 2014.
37. **C.-W. Lin**, L. Rao, J. D’Ambrosio, and A. Sangiovanni-Vincentelli, “Electrical architecture optimization and selection—cost minimization via wire routing and wire sizing,” in *SAE World Congress & Exhibition*, Detroit, MI, Apr. 2014.
38. **C.-W. Lin**, Q. Zhu, C. Phung, and A. Sangiovanni-Vincentelli, “Security-aware mapping for CAN-based real-time distributed automotive systems,” in *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, San Jose, CA, Nov. 2013.
39. **C.-W. Lin**, M. Di Natale, H. Zeng, L. T. X. Phan, and A. Sangiovanni-Vincentelli, “Timing analysis of process graphs with finite communication buffers,” in *IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)*, pp. 227–236, Philadelphia, PA, Apr. 2013.
40. S.-Y. Fang, **C.-W. Lin**, G.-W. Liao, and Y.-W. Chang, “Simultaneous OPC- and CMP-aware routing based on accurate closed-form modeling,” in *ACM International Symposium on Physical Design (ISPD)*, pp. 77–84, Stateline, NV, Mar. 2013.
41. **C.-W. Lin** and A. Sangiovanni-Vincentelli, “Cyber-security for the Controller Area Network (CAN) communication protocol,” in *ASE International Conference on Cyber Security*, pp. 344–350, Washington, DC, Dec. 2012. (**Top 3% Paper**)

42. S.-L. Huang, **C.-W. Lin**, and Y.-W. Chang, “Efficient provably good OPC modeling and its applications to interconnect optimization,” in *IEEE International Conference on Computer Design (ICCD)*, pp. 336–341, Amsterdam, Netherlands, Oct. 2010. **(Best Paper Award)**
43. P.-W. Lee, **C.-W. Lin**, Y.-W. Chang, C.-F. Shen, and W.-C. Tseng, “An efficient pre-assignment routing algorithm for flip-chip designs,” in *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, pp. 239–244, San Jose, CA, Nov. 2009.
44. **C.-W. Lin**, S.-L. Huang, K.-C. Hsu, M.-X. Lee, and Y.-W. Chang, “Efficient multi-layer obstacle-avoiding rectilinear Steiner tree construction,” in *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, pp. 380–385, San Jose, CA, Nov. 2007.
45. **C.-W. Lin**, S.-Y. Chen, C.-F. Li, Y.-W. Chang, and C.-L. Yang, “Efficient obstacle-avoiding rectilinear Steiner tree construction,” in *ACM International Symposium on Physical Design (ISPD)*, pp. 127–134, Austin, TX, Mar. 2007. **(Best Paper Nominee)**
46. **C.-W. Lin**, M.-C. Tsai, K.-Y. Lee, T.-C. Chen, T.-C. Wang, and Y.-W. Chang, (Invited) “Recent research and emerging challenges in physical design for manufacturability/reliability,” in *ACM/IEEE Asia South Pacific Design Automation Conference (ASP-DAC)*, pp. 238–243, Yokohama, Japan, Jan. 2007.
47. H.-Y. Liu, **C.-W. Lin**, S.-J. Chou, W.-T. Tu, Y.-W. Chang, and S.-Y. Kuo, “Current path analysis for electrostatic discharge protection,” in *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, pp. 510–515, San Jose, CA, Nov. 2006.
48. **C.-W. Lin**, Y.-C. Chen, and A.-C. Pang, “A new resource allocation scheme for IEEE 802.16-based networks,” in *IEEE VTS Asia Pacific Wireless Communications Symposium (APWCS)*, Daejeon, Korea, Aug. 2006.

Workshop Papers

1. C.-C. Kung, T.-L. Tsou, and **C.-W. Lin**, “Intelligent intersection management with non-connected and non-autonomous motorcycles,” in *IEEE/ACM CPS-IoT Week Workshop on Design Automation for CPS and IoT (DESTION)*, pp. 39–48, Sydney (Virtual), Australia, Apr. 2020.
2. T. Liu, J. Li, B. Kim, **C.-W. Lin**, S. Shiraishi, J. Xie, and Z. Han, “Distributed file allocation using matching game in mobile fog-caching service network,” in *IEEE INFOCOM Workshop on Integrating Edge Computing, Caching, and Offloading in Next Generation Networks (IECCO)*, pp. 499–504, Honolulu, HI, Apr. 2018.
3. T. Chowdhury, **C.-W. Lin**, B. Kim, M. Lawford, S. Shiraishi, and A. Wassying, “Principles for systematic development of an assurance case template from ISO 26262,” in *IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW)*, pp. 69–72, Toulouse, France, Oct. 2017.
4. **C.-W. Lin**, S. Shiraishi, and B. Kim, “An Amanat-based multi-party certification protocol for outsourced software in automotive systems,” in *IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW)*, pp. 13–16, Ottawa, Canada, Oct. 2016.
5. P. Joshi, V. Ganesan, H. Zeng, S. Shukla, **C.-W. Lin**, and H. Yu, (Invited) “Design space exploration for deterministic Ethernet-based architecture of automotive systems,” in *IEEE International High-Level Design Validation and Test Workshop (HLDVT)*, pp. 53–61, Santa Cruz, CA, Oct. 2016.
6. H. Yu and **C.-W. Lin**, “Security concerns for automotive communication and software architecture,” in *IEEE INFOCOM Workshop on Cross-Layer Cyber-Physical Systems Security (CPSS)*, pp. 600–603, San Francisco, CA, Apr. 2016. **(Best Paper Award)**

Report, Poster, and Extended Abstract

1. M. Al Faruque and **C.-W. Lin**, “Report of the Fourth International Workshop on Design Automation for Cyber-Physical Systems (DACPS) 2019,” in *IEEE Design & Test (D&T)*, vol. 36, no. 6, pp. 84–85, Dec. 2019.
2. **C.-W. Lin**, “From electronic design automation to automotive design automation,” in *ACM International Symposium on Physical Design (ISPD)*, pp. 101–101, San Francisco, CA, Apr. 2019.
3. **C.-W. Lin**, “Formal QoS compatibility verification for components on Time-Sensitive Networking,” in *IEEE Vehicular Networking Conference (VNC)*, pp. 1–2, Taipei, Taiwan, Dec. 2018.

Other Articles

1. **C.-W. Lin**, N. Arechiga, S. Dai, B. Kim, and S. Shiraishi, “Emerging research topics for intelligent and connected vehicles,” in *Newsletter of Technical Committee on Cyber-Physical Systems (TC-CPS)*, no. 3, pp. 9–13, Feb. 2017.
2. T.-Y. Huang, C.-J. Chang, **C.-W. Lin**, S. Roy, and T.-Y. Ho, “Intra-vehicle network routing algorithm for weight and wireless transmit power minimization,” in *Workshop on Synthesis and System Integration of Mixed Information Technologies (SASIMI)*, Yilan, Taiwan, Mar. 2015.
3. **C.-W. Lin**, M. Di Natale, H. Zeng, A. Sangiovanni-Vincentelli, “Performance analysis of synchronous models implementations on loosely time-triggered architectures,” in *Work-in-Progress Session of IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)*, Chicago, IL, Apr. 2011.
4. P.-W. Lee, **C.-W. Lin**, and Y.-W. Chang, “Fast pre-assignment flip-chip routing,” in *VLSI Design/CAD Symposium*, Hua-Lien, Taiwan, Aug. 2009. (**Best Paper Nominee**)

Book and Book Chapters

1. W. Chang, S. Burton, **C.-W. Lin**, Q. Zhu, L. Gauerhof, and J. McDermid, “Intelligent and connected cyber-physical systems: a perspective from connected autonomous vehicles,” in *Intelligent Internet of Things: From Device to Fog and Cloud*, pp. 357–392, Springer, Jan. 2020.
2. **C.-W. Lin**, B. Zheng, H. Liang, and Q. Zhu, “Platform-based design for automotive and transportation cyber-physical systems,” in *Design Automation of Cyber-Physical Systems*, pp. 21–40, Springer, May. 2019.
3. **C.-W. Lin** and A. Sangiovanni-Vincentelli, “Security-aware design for cyber-physical systems: a platform-based approach,” Springer, Jan. 2017.

Patents

1. **C.-W. Lin** and Z. Jiang, “Digital behavioral twin system for intersection management in connected environments,” US Patent App. 16/165,002, Apr. 2020. (Published and Pending)
2. M. Sayin, **C.-W. Lin**, and S. Shiraishi, “Managing roadway intersections for vehicles,” US Patent App. 15/924,979, Sep. 2019. (Published and Pending)
3. Q. Ju, B. Kim, **C.-W. Lin**, and S. Shiraishi, “Edge-assisted data transmission for connected vehicles,” US Patent App. 15/921,320, Sep. 2019. (Published and Pending)
4. **C.-W. Lin**, B. Kim, and S. Shiraishi, “Caching electronic control unit mapping solutions for connected vehicles,” US Patent App. 15/162,354, Nov. 2017. (Published and Pending)
5. **C.-W. Lin** and S. Shiraishi, “Accuracy system for connected vehicles,” US Patent 10,843,703, Nov. 2020. (JP Patent 6,737,324)
6. B. Kim, **C.-W. Lin**, and S. Shiraishi, “Vehicle with improved I/O latency of ADAS system features operating on an OS hypervisor,” US Patent 10,788,990, Sep. 2020.
7. B. Kim, **C.-W. Lin**, and S. Shiraishi, “On-demand street lighting for a connected vehicle,” US Patent 10,568,188, Feb. 2020.
8. S. Dai, N. Arechiga, **C.-W. Lin**, and S. Shiraishi, “Augmented reality vehicular assistance for color blindness,” US Patent 10,527,849, Jan. 2020. (JP Patent 6,729,636)
9. **C.-W. Lin**, B. Kim, and S. Shiraishi, “Efficient mapping from task graphs to dynamic system platforms,” US Patent 10,503,544, Dec. 2019.
10. S. Dai, N. Arechiga, **C.-W. Lin**, and S. Shiraishi, “Personalized augmented reality vehicular assistance for color blindness condition,” US Patent 10,423,844, Sep. 2019.
11. **C.-W. Lin**, B. Kim, and S. Shiraishi, “Hierarchical structures of online computation for connected vehicles,” US Patent 10,298,677, May. 2019.
12. **C.-W. Lin** and S. Shiraishi, “Implementation decision to provide ADAS function update for a vehicle,” US Patent 10,248,410, Apr. 2019. (JP Patent 6,677,276)

13. B. Kim, **C.-W. Lin**, and S. Shiraishi, “Selective remote control of ADAS functionality of vehicle,” US Patent 10,203,699, Feb. 2019. (JP Patent 6,729,739)
14. S. Shiraishi, M. Yamaura, and **C.-W. Lin**, “User profile-based automatic parameter tuning system for connected vehicles,” US Patent 10,202,127, Feb. 2019. (JP Patent 6,428,835)
15. **C.-W. Lin**, H. Yu, and B. Zheng, “Supervising method for dynamic and large data loads in automotive systems,” US Patent 10,124,779, Nov. 2018.
16. H. Yu, B. Zheng, and **C.-W. Lin**, “Compatibility module to support an automotive system upgrade,” US Patent 10,001,988, Jun. 2018. (JP Patent 6,245,388)
17. B. Kim, **C.-W. Lin**, and S. Shiraishi, “Personalized medical emergency autopilot system based on portable medical device data,” US Patent 9,932,041, Apr. 2018. (JP Patent 6,508,258)
18. C.-F. Chang, C.-F. Shen, H.-S. Chiu, I.-J. Lin, T.-C. Hsu, Y.-W. Chang, **C.-W. Lin**, and P.-W. Lee, “Routing method for flip chip package and apparatus using the same metal layer,” US Patent 8,578,317, Oct. 2010.

Talks

1. **C.-W. Lin**, “Re-imagine your Grading with Gradescope: lessons learned from your peers,” APAC Webcast Series, Turnitin, May. 2021.
2. **C.-W. Lin**, “Modeling and verification for intelligent vehicles: intersection management and weakly-hard fault-tolerant systems,” Robotics Institute, Carnegie Mellon University, Mar. 2021. (Guest Lecture, Provably Safe Robotics)
3. **C.-W. Lin**, “Model-based design and platform-based design,” Department of Electrical Engineering, National Taiwan University, Jan. 2021. (Guest Lecture, Switching Circuit and Logic Design)
4. **C.-W. Lin**, “From electronic design automation to automotive design automation,” Department of Electrical Engineering, National Taiwan University, Jun. 2020. (Guest Lecture, Introduction to Electronic Design Automation)
5. **C.-W. Lin**, “IoT system-level security: case study of connected vehicles,” Department of Computer Science and Information Engineering, National University of Kaohsiung, Dec. 2019. (Guest Lecture, Embedded Systems)
6. **C.-W. Lin**, “Formal verification on finite-state machines with weakly-hard fault models,” Dagstuhl Seminar 19502: Future Automotive HW/SW Platform Design, Dec. 2019.
7. **C.-W. Lin**, “Mobile edge caching for automotive applications,” ITRI College, Industrial Technology Research Institute, Nov. 2019.
8. **C.-W. Lin**, “Intersection management with mixed traffic,” NTU IoX Center, National Taiwan University, Nov. 2019.
9. **C.-W. Lin**, “Modeling, design, and analysis for intelligent vehicles: intersection management, security-aware design, and system verification,” Robotics Institute, Carnegie Mellon University, Oct. 2019.
10. **C.-W. Lin**, “From electronic design automation to automotive design automation,” EDA Camp, Graduate Institute of Electronics Engineering, National Taiwan University, Aug. 2019.
11. **C.-W. Lin**, “Applications and challenges for connected and autonomous vehicles,” SoC Center, National Taiwan University, Jun. 2019.
12. **C.-W. Lin**, “From electronic design automation to automotive design automation,” Department of Electrical Engineering, National Taiwan University, Jun. 2019. (Guest Lecture, Introduction to Electronic Design Automation)
13. **C.-W. Lin**, “Design and analysis for connected and autonomous vehicles,” FIH Mobile Limited, May. 2019.
14. **C.-W. Lin**, “Algorithms in circuit design and automotive design,” Department of Electrical Engineering, National Taiwan University, May. 2019. (Guest Lecture, Algorithms)
15. **C.-W. Lin**, “From electronic design automation to automotive design automation,” Department of Computer Science, National Tsing Hua University, May. 2019. (Guest Lecture, Design Automation of Emerging Technologies)
16. **C.-W. Lin**, “Design and analysis for connected and autonomous vehicles,” MediaTek Inc., May. 2019.
17. **C.-W. Lin**, “Design and analysis for connected and autonomous vehicles,” Department of Electrical Engineering, National Chung Cheng University, Apr. 2019.

18. **C.-W. Lin**, “Design and analysis for connected and autonomous vehicles,” Institute of Communications Engineering, National Tsing Hua University, Mar. 2019.
19. **C.-W. Lin**, “Technology and challenges of intelligent vehicles,” Cathay Financial Holdings Co., Ltd., Mar. 2019.
20. **C.-W. Lin**, “Recent research in design and analysis for intelligent vehicles,” Computer Engineering and Systems Group (CESG) Fishbowl Seminar, Texas A&M University, Jan. 2019.
21. **C.-W. Lin**, “Recent research in design and analysis for intelligent vehicles,” Intelligent Transportation Creative Idea Competition, National Chiao Tung University, Jan. 2019.
22. **C.-W. Lin**, “Vehicle functional safety certification and technology having potential impacts on laws and regulations,” MOST Joint Research Center for AI Technology and All Vista Healthcare, Nov. 2018.
23. **C.-W. Lin**, “Recent research in design and analysis for intelligent vehicles,” Institute of Information Science, Academia Sinica, Nov. 2018.
24. **C.-W. Lin**, “Recent research in design and analysis for intelligent vehicles,” Department of Computer Science and Information Engineering, National Taipei University, Oct. 2018.
25. **C.-W. Lin**, “General design approaches for intelligent vehicles and medical devices,” Integrated Medical Database, National Taiwan University Hospital, Oct. 2018.
26. **C.-W. Lin**, “Security and robustness of connected and autonomous vehicles,” NTU IoX Center, National Taiwan University, Oct. 2018.
27. **C.-W. Lin**, “Security of connected and autonomous vehicles,” Department of Computer Science and Information Engineering, National Taiwan University, Oct. 2018.
28. **C.-W. Lin**, “From electronic design automation to automotive design automation,” EDA Camp, Graduate Institute of Electronics Engineering, National Taiwan University, Aug. 2018.
29. **C.-W. Lin**, “Recent research and emerging challenges in design automation for connected and autonomous vehicles,” IEEE International Workshop on Design Automation for Cyber-Physical Systems (DACPS), Jun. 2018.
30. **C.-W. Lin**, “Innovative design and analysis for intelligent and connected vehicles,” Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, May. 2018.
31. **C.-W. Lin**, “Innovative design and analysis for intelligent and connected vehicles,” Department of Electrical Engineering and Computer Science, Northwestern University, Feb. 2018.
32. **C.-W. Lin**, “Innovative design and analysis for intelligent and connected vehicles,” Department of Computer Science, Columbia University, Jan. 2018.
33. **C.-W. Lin**, “Innovative design and analysis for intelligent and connected vehicles,” Graduate Institute of Electronics Engineering, National Taiwan University, Dec. 2017.
34. **C.-W. Lin**, “Innovative design and analysis for intelligent and connected vehicles,” Department of Computer Science and Information Engineering, National Taiwan University, Dec. 2017.
35. **C.-W. Lin**, “Innovative design and analysis for intelligent and connected vehicles,” Department of Communications and Computer Engineering, Kyoto University, Dec. 2017.
36. **C.-W. Lin**, “Innovative design and analysis for intelligent and connected vehicles,” Department of Computer Science, University of Illinois at Urbana-Champaign, Nov. 2017.
37. **C.-W. Lin**, “Innovative design and analysis for intelligent and connected vehicles,” Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, Oct. 2017.
38. **C.-W. Lin**, “Design framework and evolutionary architecture for next-generation connected vehicles,” Department of Electrical and Computer Engineering, University of California, Riverside, May. 2017.
39. **C.-W. Lin**, “Design framework and evolutionary architecture for next-generation connected vehicles,” College of Computer and Information Science, Northeastern University, Feb. 2017.
40. **C.-W. Lin**, “Design framework and evolutionary architecture for next-generation connected vehicles,” School of Engineering and Applied Science, University of Pennsylvania, Feb. 2017.

41. **C.-W. Lin**, “Design framework and evolutionary architecture for next-generation connected vehicles,” ECE Seminar, Boston University, Oct. 2016.
42. **C.-W. Lin**, “In-vehicle network design for security and plug-and-play,” Center for Embedded Systems for Critical Applications (CESCA) Seminar, Virginia Polytechnic Institute and State University, Feb. 2016.
43. **C.-W. Lin**, “Introduction to in-vehicle networks—security and plug-and-play,” EECS, University of California, Berkeley, Jan. 2016. (Guest Lecture, Embedded System Design: Modeling, Analysis, and Synthesis)
44. **C.-W. Lin**, “Design for security,” UTC Institute for Advanced Systems Engineering, University of Connecticut, Oct. 2015. (Guest Lecture, Design Flows for Embedded/Networked Systems)
45. **C.-W. Lin**, “Security-aware design for real-time distributed cyber-physical systems,” Intel-NTU Connected Context Computing Center, National Taiwan University, Sep. 2015.
46. **C.-W. Lin**, “Security-aware design for real-time distributed cyber-physical systems,” Department of Electrical and Computer Engineering, University of Utah, Feb. 2015.
47. **C.-W. Lin**, “Security-aware mapping for real-time distributed embedded systems,” STARnet e-Workshop, Semiconductor Research Corporation, Apr. 2014.
48. **C.-W. Lin**, A. Sangiovanni-Vincentelli, and S. Seshia, “Design and analysis for security,” TerraSwarm Annual Review, TerraSwarm Research Center, Nov. 2013.
49. **C.-W. Lin**, “Security mechanisms and security-aware mapping for real-time distributed automotive systems,” Secure Computing Research for Users’ Benefit (SCRUB) Seminar, University of California, Berkeley, Oct. 2013.
50. **C.-W. Lin**, “Cyber-security for Controller Area Network and its security-aware mapping,” Design of Robotics and Embedded Systems, Analysis, and Modeling Seminar (DREAMS), University of California, Berkeley, Sep. 2013.

Theses

1. **C.-W. Lin**, “Security mechanisms and security-aware mapping for real-time distributed embedded systems,” Ph.D. Thesis, University of California, Berkeley, Aug. 2015.
2. **C.-W. Lin**, “Efficient obstacle-avoiding rectilinear Steiner tree construction,” M.S. Thesis, National Taiwan University, Jun. 2007.

TEACHING

CSIE5452: Introduction to Intelligent Vehicles, NTU	Fall 2020, 2019, 2018
CSIE5026: Special Topics in Innovative Integration of Medicine and EECS (I), NTU (Co-Taught)	Fall 2020
CSIE2344: Digital Systems Design and Laboratory, NTU	Spring 2020, 2019
CSIE5742: Special Topics in Innovative Integration of Medicine and EECS (II), NTU (Co-Taught)	Spring 2020
CSIE3311: Computer System Laboratory, NTU	Fall 2019
CSIE5741: Special Topics in Innovative Integration of Medicine and EECS, NTU (Co-Taught)	Fall 2019
CS70: Discrete Mathematics and Probability Theory, UC Berkeley	Summer 2015
<ul style="list-style-type: none"> • Teach ~300 Students and Lead 11 TAs and 14 Readers • Student Evaluation = 6.2/7.0 	

EXPERIENCES

Researcher, Systems and Software Division, Toyota InfoTechnology Center, USA, Inc.	2015.09–2018.07
Graduate Student Instructor, Discrete Mathematics and Probability Theory, UC Berkeley	2015.06–2015.08
Graduate Student Instructor (TA), Discrete Mathematics and Probability Theory, UC Berkeley	2014.01–2014.05
<ul style="list-style-type: none"> • Student Evaluation = 4.9/5.0 	
Summer Intern, General Motors	2013.05–2013.08
Graduate Student Instructor (TA), Discrete Mathematics and Probability Theory, UC Berkeley	2013.01–2013.05
<ul style="list-style-type: none"> • Student Evaluation = 4.7/5.0 	
Summer Intern, General Motors	2012.05–2012.08
Summer Intern, General Motors	2011.05–2011.08
Research Assistant (Joint Project with Synopsys Taiwan), NTU	2009.02–2009.07

Military Instructor in Information System (Second Lieutenant), R.O.C. Army	2007.11–2008.06
Compulsory Military Service, R.O.C. Army	2007.07–2008.06
Research Assistant (Joint Project with Taiwan Semiconductor Manufacturing Company), NTU	2006.05–2007.06
Teaching Assistant, Nonlinear Programming, NTU	2007.02–2007.06
Teaching Assistant, Logic Synthesis and Verification, NTU	2006.09–2007.01

HONORS

Young Scholar Fellowship (Einstein Program), Ministry of Science and Technology, Taiwan	2019.02
Yushan Young Scholar Program, Ministry of Education, Taiwan	2018.08
Best Paper Award, ACM Transactions on Design Automation of Electronic Systems	2016.06
Best Paper Award, IEEE INFOCOM Workshop on Cross-Layer Cyber-Physical Systems Security	2016.04
Outstanding Graduate Student Instructor Award, UC Berkeley	2015.05
Best Paper Award, IEEE International Conference on Computer Design	2010.10
EECS Department Fellowship, EECS, UC Berkeley	2009.08
The Best M.S. Thesis Award, Graduate Institute of Electronics Engineering, NTU	2007.12
The 1st Prize, Youth Thesis Award, Chinese Institute of Electrical Engineering	2007.12
The 1st Prize, IC/CAD Contest, Ministry of Education, Taiwan	2007.07
Member of Phi-Tau-Phi Scholastic Honor Society (Top 3% Students)	2007.06
Two-Time EDA Scholarship, SpringSoft Education Foundation	2007.07, 2006.07
Two-Time Champion, Tennis Team Competition (Division II), National College Games	2006.04, 2004.03
Scholarship (Rank 1st in Program Entrance of EDA Group)	Incentia 2005.09
Member of Phi-Tau-Phi Scholastic Honor Society (Top 1% Students)	2005.06
Six-Time Presidential Award (Top 5% Students), NTU	2005.04, etc.

SERVICES

Co-Chair, IEEE International Workshop on Design Automation for Cyber-Physical Systems (DACPS)	2019, 2018
Special Session Chair, IEEE International Conference on Embedded Software and Systems (ICESS)	2019
Publicity Chair, ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)	2021
Automotive Committee Member, ACM/IEEE Design Automation Conference (DAC)	2017
TPC Member, IEEE Real-Time Systems Symposium (RTSS)	2021, 2020
TPC Member, IEEE Vehicular Networking Conference (VNC)	2021, 2020, 2019, 2018
TPC Member, International Conference on Runtime Verification (RV)	2021, 2020
TPC Member, ACM International Conference on Embedded Software (EMSOFT)	2021
TPC Member, ACM/IEEE Design Automation Conference (DAC)	2021, 2020, 2019, 2018, 2017
TPC Member, ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)	2021
TPC Member, IEEE Vehicular Technology Conference (VTC-Spring)	2021, 2019
TPC Member, ACM Symposium on Applied Computing (SAC)	2021
TPC Member, ACM Workshop on Automotive Cybersecurity (AutoSec)	2021, 2020, 2019
TPC Member, ACM/IEEE Design, Automation and Test in Europe Conference (DATE)	2021
TPC Member, IEEE International Symposium on Smart Electronic Systems (iSES)	2020, 2019, 2018
TPC Member, ACM/IEEE Asia South Pacific Design Automation Conference (ASP-DAC)	2020, 2019, 2016
TPC Member, IEEE Conference on Dependable and Secure Computing (DSC)	2018
TPC Member, IEEE International Symposium on Industrial Embedded Systems (SIES)	2018, 2017, 2016
TPC Member, IEEE International Symposium on Nanoelectronic and Information Systems (iNIS)	2017, 2016, 2015
TPC Member, IEEE International Conference on Embedded Software and Systems (ICESS)	2016, 2015
Journal Reviewer, ACM JETC/TCPS/TECS/TODAES	
Journal Reviewer, IEEE Access/CEM/D&T/ESL/IoT-J/PIEEE	
Journal Reviewer, IEEE T-IV/TAES/TC/TCAD/TDSC/TIFS/TII/TMC/TPDS/TVLSI/TVT	
Journal Reviewer, IEEE/ACM TNET	
Journal Reviewer, SAE JCAV	
Conference Reviewer, ACM e-Energy/GLSVLSI/ISPD/SAC	
Conference Reviewer, ACM/IEEE ASP-DAC/CODES+ISSS/DAC	
Conference Reviewer, IEEE ACC/CSCITA/FPT/IECON/INFOCOM/ITSC/IV/MT-ITS	
Conference Reviewer, IEEE RTAS/RTSS/SOCC/TENCON/VTC-FALL/VLSI-DAT	
Conference Reviewer, IEEE/ACM ICCAD	

Conference Reviewer, SAE WCX

ACTIVITIES

Member of Tennis Team, NTU

2002.09–2007.06

Chairman of EECS College Students Association, NTU

2003.07–2004.06