



# Prof. Renfa Li

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## Contact Information

Key Laboratory for Embedded and Network Computing of Hunan Province  
Department of Computer Engineering  
College of Computer Science and Electronic Engineering  
Hunan University, Changsha, Hunan, China  
lirenfa@hnu.edu.cn

## Biography

Renfa Li is currently a Full Professor in the Department of Computer Engineering at Hunan University, and is the Director of the Key Laboratory for Embedded and Network Computing of Hunan Province. He received his B.S. degree and M.S. degree from Tianjin University, China, and his Ph.D. degree from Huazhong University of Science and Technology, China. He has been engaged in university teaching and research work since 1987. He was the Dean of the College of Computer and Communication from 2002 to 2010, and the Director of the Dean's Office from 2010 to 2014 at Hunan University. He has served as the Dean of the College of Information Science and Engineering at Hunan University from 2014 to 2017. He is also a Member of the Expert Board of National Supercomputing Center in Changsha, Hunan, China. Before joined Hunan University, He was the Director of Computing Center, the Department Head, and later the Vice President of Xiangtan Institute of Technology (Now Hunan University of Science and Technology). He won the National Excellent Teacher Award, received the Hunan Province First-Class Merit, and is an Expert with Special Allowance from the State Council.

In recent years, he has published 12 books (including monographs, textbooks, translations, etc.), and more than 300 papers in the academic journals and conferences. He is holding 9 China Invention Patents and has 4 patent applications under authorization process. He has won 2 First-Class prizes and 5 Second-Class prizes from Hunan Province and different National departments. He has completed more than 20 national science and technology projects (including National Core Electronic Devices, High-end Generic Chips and Basic Software, 973 Program, 863 Program, National Natural Science Foundation of China, National Major Science and Technology Support Program, Key Science and Technology Program of Ministry

of Education, Provincial Key Science and Technology Program). He is the organizer of several National Quality Courses and the leading head of Hunan Province Excellent Teaching Team.

## Research Interests

Computer System Architecture, Embedded System and Cyber-Physical Systems, Vehicular Computing and Autonomous Driving, Supercomputer Application Software, etc.

## Teaching

### M.S. Program

Computer System Architecture, Embedded Software Development, Principles of Embedded Computing System Design.

### Ph.D. Program

Principles of Cyber-Physical System.

## Professional Services

Senior Member of IEEE, Senior Member of ACM, Council Member of China Computer Federation (CCF), Council Member of China System Simulation Federation, Senior Member of China Institute of Electronics, Senior Member of China Institute of Communications, Member of CCF Academic Committee, Vice Director of CCF Embedded System Expert Committee, Member of CCF Internet of Things Expert Committee, Member of China Education Expert Association, Vice Chairman of Hunan Computer Federation, Vice Chairman of Hunan Electronic Institute, Managing Director of Hunan Institute of Communications, Expert of Hunan Software Industry Association.

Editor of the Journal of Computer Research and Development, Editor of the Journal of Communications, Editor of the Journal of System Simulation, Editor of the Journal of Computer Science and Engineering, Editor of the Journal of Mini-Micro Computer Systems.

## Current Research Projects

1. Research on Modeling and Algorithms of Functional Safety for New Generation Automotive Embedded Systems (National Natural Science Foundation of China)
2. Research on program optimization method of architecture-aware (National Key Research and Development Program of China))
3. Industry application, market analysis and research on electromagnetic computing software (863 Program of China)))

## Recent Publications

Journals:

- [1] Jing Huang, Renfa Li, Jiyao An, Derrick Ntalasha, Fan Yang, and Keqin Li. Energy-Efficient Resource Utilization for Heterogeneous Embedded Computing Systems. *IEEE Transactions on Computers*, vol. 66, no. 9, pp. 1518-1531, Sept. 2017. (WOS:000407449400005)
- [2] Weihong Chen, Guoqi Xie, Renfa Li, Yang Bai, Chunnian Fan, and Keqin Li. Efficient Task Scheduling for Budget Constrained Parallel Applications on Heterogeneous Cloud Computing Systems. *Future Generation Computer Systems*, vol. 74, pp. 1-11, Sept. 2017.
- [3] Hongfang Gong, Renfa Li, Jiyao An, Weiwei Chen, and Keqin Li. Scheduling Algorithms of Flat Semi-Dormant Multicontrollers for a Cyber-Physical System. *IEEE Transactions on Industrial Informatics*, vol. 13, no. 4, pp. 1665-1680, Aug. 2017. (WOS:000406933400018)
- [4] Guoqi Xie, Yuekun Chen, Yan Liu, Yehua Wei, Renfa Li, and Keqin Li. Resource Consumption Cost Minimization of Reliable Parallel Applications on Heterogeneous Embedded Systems. *IEEE Transactions on Industrial Informatics*, vol. 13, no. 4, pp. 1629-1640, Aug. 2017.
- [5] Guoqi Xie, Gang Zeng, Zhetao Li, Renfa Li, and Keqin Li. Adaptive Dynamic Scheduling on Multi-functional Mixed-Criticality Automotive Cyber-Physical Systems. *IEEE Transactions on Vehicular Technology*, vol. 66, no. 8, pp. 6676-6692, Aug. 2017.
- [6] Guoqi Xie, Gang Zeng, Ryo Kurachi, Hiroaki Takada, Zhetao Li, Renfa Li, and Keqin Li. WCRT Analysis of CAN Messages in Gateway-integrated In-vehicle Networks. *IEEE Transactions on Vehicular Technology*, online, Aug. 2017.
- [7] Guoqi Xie, Xiongren Xiao, Renfa Li, and Keqin Li. Schedule Length Minimization of Parallel Applications with Energy Consumption Constraints using Heuristics on Heterogeneous Distributed Systems. *Concurrency and Computation: Practice and Experience*, vol. 29, no.16, pp. 1-10, Aug. 2017. (WOS:000406232100011)
- [8] Guoqi Xie, Gang Zeng, Xiongren Xiao, Renfa Li, and Keqin Li. Energy-efficient Scheduling Algorithms for Real-time Parallel Applications on Heterogeneous Distributed Embedded Systems. *IEEE Transactions on Parallel and Distributed Systems*, online, Jul. 2017.
- [9] Guoqi Xie, Yuekun Chen, Xiongren Xiao, Cheng Xu, Renfa Li, and Keqin Li. Energy-efficient Fault-tolerant Scheduling of Reliable Parallel Applications on Heterogeneous Distributed Embedded Systems. *IEEE Transactions on Sustainable Computing*, online, Jun. 2017.
- [10] Guoqi Xie, Gang Zeng, Renfa Li, and Keqin Li. Energy-aware Processor Merging Algorithms for Deadline Constrained Parallel Applications in Heterogeneous Cloud Computing. *IEEE Transactions on Sustainable Computing*, vol. 2, no. 2, pp. 62-75, Jun. 2017.
- [11] Guoqi Xie, Junqiang Jiang, Yan Liu, Renfa Li, and Keqin Li. Minimizing Energy Consumption of Real-Time Parallel Applications Using Downward and Upward Approaches on Heterogeneous Systems. *IEEE Transactions on Industrial Informatics*, vol. 13, no. 3, pp. 1068-1078, Jun. 2017. (WOS:000402929700014)

- [12] Guoqi Xie, Gang Zeng, Junqiang Jiang, Chunnian Fan, Renfa Li, and Keqin Li. Energy Management for Multiple Real-time Workflows on Cyber-Physical Cloud Systems. *Future Generation Computer Systems*, online, May 2017.
- [13] Xiongren Xiao, Guoqi Xie, Cheng Xu, Chunnian Fan, Renfa Li, and Keqin Li. Maximizing Reliability of Energy Constrained Parallel Applications on Heterogeneous Distributed Systems. *Journal of Computational Science*, online, May 2017.
- [14] Guoqi Xie, Gang Zeng, Yuekun Chen, Yang Bai, Zhili Zhou, Renfa Li, and Keqin Li. Minimizing Redundancy to Satisfy Reliability Requirement for a Parallel Application on Heterogeneous Service-oriented Systems. *IEEE Transactions on Services Computing*, online, Feb. 2017.
- [15] Guoqi Xie, Yuekun Chen, Yan Liu, Chunnian Fan, Renfa Li, and Keqin Li. JDAS: A Software Development Framework for Multidatabases. *Software: Practice and Experience*, on line, Jan. 2017.
- [16] Guoqi Xie, Liangjiao Liu, Liu Yang, and Renfa Li. Scheduling trade-off of dynamic multiple parallel workflows on heterogeneous distributed computing systems. *Concurrency and Computation: Practice and Experience*, vol. 29, no. 2, pp. 1-12, Jan. 2017.
- [17] Jiayi Du, Renfa Li, Zheng Xiao, Zhao Tong, and Li Zhang. Optimization of Data Allocation on CMP Embedded System with Data Migration. *International Journal of Parallel Programming*, vol. 45, no. 4, pp. 965-981, Aug. 2017. (WOS:000404769300012)
- [18] Guoqi Xie, Gang Zeng, Liangjiao Liu, Renfa Li, and Keqin Li. Mixed real-time scheduling of multiple DAGs-based applications on heterogeneous multi-core processors. *Microprocessors and Microsystems*, vol. 47, pp. 93-103, Nov. 2016. (WOS:000390510400012)
- [19] Guoqi Xie, Gang Zeng, Liangjiao Liu, Renfa Li, and Keqin Li. High performance real-time scheduling of multiple mixed-criticality functions in heterogeneous distributed embedded systems. *Journal of Systems Architecture*, vol. 70, pp. 3-14, Oct. 2016. (WOS:000388061000002)
- [20] Guoqi Xie, Renfa Li, and Keqin Li. Heterogeneity-driven end-to-end synchronized scheduling for precedence constrained tasks and messages on networked embedded systems. *Journal of Parallel and Distributed Computing*, vol. 83, pp. 1-12. Sept. 2015. (WOS:000358755700001)
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- [22] Tieqiang Mo, and Renfa Li. A new memory mapping mechanism for GPGPUs' stencil computation. *Computing*, vol. 97, no. 8, pp. 795-812, Aug. 2015. (WOS:000358131600002)
- [23] Ying Xu, Tiantian Zhang, and Renfa Li. An Implementation of an Intelligent PCE-Agent-Based Multi-domain Optical Network Architecture. *Intelligent Computing Methodologies*, vol. 8589, pp. 375-384, 2014. (WOS:000345517200039)

- [24] Xianzhong Xia, Renfa Li, and Jiyao An. On Delay-Fractional-Dependent Stability Criteria for Takagi-Sugeno Fuzzy Systems with Interval Delay. *Mathematical Problems in Engineering*, vol. 2014, no. 1, pp. 1-13, 2014. (WOS:000332278100001)
- [25] Ying Xu, Rong Qu, and Renfa Li. A simulated annealing based genetic local search algorithm for multi-objective multicast routing problems. *Annals of Operations Research*, vol. 206, no. 1, pp. 527-555, Jul. 2013.
- [26] Yi Wang, and Renfa Li. FPGA based unified architecture for public key and private key cryptosystems. *Frontiers of Computer Science*, vol. 7, no. 3, pp. 307-316, Jun. 2013.
- [27] Ahmed A. M. Hamed, Renfa Li, Zhang Xiaoming, and Cheng Xu. Video Genre Classification Using Weighted Kernel Logistic Regression. *Advances in Multimedia*, vol. 2013, no. 4, 2013. (EI:20134516942087)
- [28] Abouty Sroy, Renfa Li, Fanzi Zeng, and Mangone Fall. A Novel Iterative Clipping and Filtering Technique for PAPR Reduction of OFDM Signals: System Using DCT/IDCT Transform. *International Journal of Future Generation Communication and Networking*, vol. 6, no.1, pp. 1-8, 2013. (EI:20131116114926)
- [29] Abouty Sroy, Renfa Li, Fanzi Zeng, and Pepin Magnangana ZokoGoyoro Achille. New SLM technique with low complexity based on matrices combined with DCT transform for PAPR reduction in OFDM communication systems. *Journal of Convergence Information Technology*, vol. 7, no. 17, pp. 232-242, 2012. (EI:20124115548302)
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- [34] HongShao Cai, and Renfa Li. The Analysis of Industry Organization Model Based on the Economic and Ecological Benefits. *Advanced Materials Research*, vol. 204-210, pp. 1203-1206, 2011.
- [35] Shufan Yang, Qiang Wu, Renfa Li. A case for spiking neural network simulation based on configurable multiple-FPGA systems. *Cognitive Neurodynamics*, vol. 5, no. 3, pp. 301-309, Sept. 2011.
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#### Conferences:

- [1] Jing Yang, and Renfa Li. A container resource configuration method in Hadoop

Transcoding cluster based on requirements of a sample split. 2017 IEEE 2nd International Conference on Cloud Computing and Big Data Analysis (ICCCBDA), Chengdu, 2017, pp. 108-112.

[2] Siping Liu, Xiaohan Tu, and Renfa Li. Unifying explicit and implicit feedback for Top-N recommendation. 2017 IEEE 2nd International Conference on Big Data Analysis (ICBDA), Beijing, 2017, pp. 35-39.

[3] Xiaohan Tu, Siping Liu, and Renfa Li. Improving Matrix Factorization Recommendations for Problems in Big Data. 2017 IEEE 2nd International Conference on Big Data Analysis (ICBDA), Beijing, 2017, pp. 193-197.

[4] Xiongren Xiao, Guoqi Xie, Renfa Li, and Keqin Li. Minimizing Schedule Length of Energy Consumption Constrained Parallel Applications on Heterogeneous Distributed Systems. 2016 IEEE Trustcom/BigDataSE/ISPA, Tianjin, 2016, pp. 1471-1476. (WOS:000401929800193)

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[7] Guoqi Xie, Gang Zeng, Ryo Kurachi, Hiroaki Takada, and Renfa Li. Gateway Modeling and Response Time Analysis on CAN Clusters of Automobiles. 2015 IEEE 17th International Conference on High Performance Computing and Communications, New York, 2015, pp. 1147-1153. (WOS:000380408100190)

[8] Xin Huang, Yizhi Huang, Yan Liu, Renfa Li, and Xin Peng. A strip level data layout strategy for heterogeneous parallel storage systems. 2015 11th International Conference on Natural Computation (ICNC), Zhangjiajie, 2015, pp. 1085-1091. (WOS:000380617000188)

[9] Liangjiao Liu, Guoqi Xie, Liu Yang, and Renfa Li. Schedule Dynamic Multiple Parallel Jobs with Precedence-Constrained Tasks on Heterogeneous Distributed Computing Systems. 2015 14th International Symposium on Parallel and Distributed Computing, Limassol (ISPDC), Limassol, 2015, pp. 130-137. (WOS:000380396000017)

## External Exchange

Name	University	Country	International Supervisor	Research Topics	Program	Date
Jia Zhou	Virginia Tech	USA	Haibo Zeng	Automotive Embedded System Security	Doctoral Joint Program	2017-2018
Wanli Li	University of Waterloo	Canada	Fakhri Karray	Auxiliary Driving	Doctoral Joint Program	2017-2018
Wufei Wu	Nagoya University	Japan	Hiroaki Takada	Automotive Embedded System	Doctoral Joint Program	2016-2017
Shi Xu	Delft University of Technology	Netherlands	Sorin Cotofana	Reliability Device Quantum Computer	Doctoral Joint Program	2016-2017
Fan Yang	Michigan State University	USA	Alex.X Liu	Cyber-Physical Systems	Doctoral Joint Program	2014-2015
Xin Huang	Illinois Tech	USA	Xianhe Sun	Parallel and Distributed Systems	Doctoral Joint Program	2012-2013
Guoqi Xie	Nagoya University	Japan	Hiroaki Takada	Automotive Embedded System	Doctoral Joint Program	2014-2015
Yong Xie	Nagoya University	Japan	Hiroaki Takada	Automotive Embedded System	Doctoral Joint Program	2011-2012
Di Wu	University of California, Irvine	USA	Amelia C. Regan	Future Networking Intelligent Analytics Smart Architecture	Ph.D. Degree in UCI	2009-2013
Chen Pan	The University of Alabama	USA			Ph.D. Degree in UA	
Zhi Chen	University of California, Irvine	USA			Ph.D. Degree in UCI	