

GUOQIANG LI

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School of Software,
Shanghai Jiao Tong University
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Work Experience

- Associate professor School of Software, Shanghai Jiao Tong University 2014.1 –
- Guest associate professor Research and Development Center for Smart Mobility, Kyushu University 2016.12 –
- Academic visitor Department of Computer Science, University of Oxford 2015.7 – 2016.7
- Assistant professor School of Software, Shanghai Jiao Tong University 2009.4 – 2013.12
- Liaison staff Bureau of International Cooperation, NSFC 2009.12 – 2010.12
- Posdoc researcher NCES, Graduate School of Information Science, Nagoya University, 2008.4 – 2009.3

Education Background

- PhD. Major in formal verification, School of information science, Japan Advanced Institute of Science and Technology. 2005.4– 2008.3
- MSc. Major in computer software and theory, Department of CST, Shanghai Jiao Tong University. 2002.9–2005.3
- BSc. Major in computer software, Department of CST, Taiyuan University of Technology. 1997.9–2001.7

Research Interests

formal verification, programming language theory, data analytics, computational learning theory

Representative Projects

- Reliability of Safety Critical Software Systems , Sub-project PI, NSFC Key Program, 2018-2022
- Theory and Methodology of Asynchronously Communicating Program Analysis PI, NSFC General Program, 2017-
- Verification on Reachability Problem of Time-Sensitive Pushdown Systems PI, NSFC General Program, 2015-2018
- Methodology of Program Analysis Based on Automata Model Checking with Time Issues PI, NSFC Youth, 2012-2014

Lectures

- Computability theory for undergraduates
- Principles of algorithms for undergraduates
- Fundamentals of programming languages for graduates
- Approximation algorithms for graduates

Selected Publications

Transactions and Journals

Haitao Zhang, Guoqiang Li, Zhuo Cheng, Jinyun Xue. Verifying OSEK/VDX Automotive Applications: A Spin-Based Model Checking Approach. *Software: Testing, Verification and Reliability*, accepted

Congcong Ye, Guoqiang Li*, Hongming Cai, Yonggen Gu. Evaluating the Safety of Blockchain. *Journal of Software (软件学报)*, accepted

Zhong Wang, Daniel Sun, Guangta Xue, Shiyu Qian, Guoqiang Li, Minglu Li. Ada-Things: An Adaptive Virtual Machine Monitoring and Migration Strategy for Internet of Things Applications. *Journal of Parallel and Distributed Computing*, accepted

Shunting Huang, Ling Li, Hongming Cai, Boyi Xu, Guoqiang Li, Lihong Jiang. A Configurable WoT Application Platform Based on Spatiotemporal Semantic Scenarios. *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, accepted

Ling Fang, Chunyan Mu, Zhuo Cheng, Guoqiang Li. Evaluation of Redundancy Based System: A Model Checking Approach. *SCIENCE CHINA Information Sciences*, accepted

Guoqiang Li, Li Liu, Akira Fukuda. Asynchronous Multi-Process Timed Automata. *Software Quality Journal*, accepted

Yue Ding, Dong Wang, Xin Xin, Guoqiang Li, Daniel Sun, Xuezhi Zeng, Rajiv Ranjan. SCFM: Social and Crowdsourcing Factorization Machines for Recommendation, *Applied Soft Computing*, accepted

Chunmiao Li, Xiaojuan Cai, Guoqiang Li. Lower Bound for Coverability Problem of Well-Structured Push-down Systems. *Journal of Software (软件学报)*, accepted

Ruoyu Wang, Guoqiang Li, Jianwen Xiang, Hongming Cai. A Customized Automata Algorithm and Toolkit for Language Learning and Application, *International Journal of Big Data Intelligence*, accepted

Daniel Sun, Alan Fekete, Vincent Gramoli, Guoqiang Li, Xiwei Xu, Liming Zhu. R²C: Robust Rolling-Upgrade in Clouds, *IEEE Transactions on Dependable and Secure Computing*, accepted

Chenxiao Dou, Yi Cui, Daniel Sun, Raymond Wong, Muhammad Atif, Guoqiang Li, Rajiv Ranjan. Unsupervised Blocking and Probabilistic Parallelisation for Record Matching of Distributed Big Data. *Journal of Supercomputing*, accepted

Haitao Zhang, Zhuo Cheng, Guoqiang Li, Shaoying Liu. autoC: an Efficient Translator for Model Checking Deterministic Scheduler based OSEK/VDX Applications, *SCIENCE CHINA Information Sciences*, Vol. 61(5), 052102:1 - 052102:15, 2018

Guoqiang Li, Yunqing Wen, Shoji Yuen. Updatable Timed Automata with One Updatable Clock, *SCIENCE CHINA Information Sciences*, Vol. 61(1), 012102:1 - 012102:15, 2018

Haitao Zhang, Guoqiang Li, Daniel Sun, Yonggang Lu. Verifying Deterministic Scheduler based Cooperative Software: a SMT-based Bounded Model Checking Approach. *Journal of Systems Architecture*, Vol. 81, 7-16, 2017

Xiuting Tao, Guoqiang Li, Daniel Sun, Hongming Cai. A Game-Theoretic Model and Analysis for Exchange Mechanisms, *Future Generation Computer Systems*, Vol. 76, 582-589, 2017

Li Liu, Guoqiang Li. The Coverability Problem of Asynchronous Multi-Process Timed Automata, *Journal of Software (软件学报)*, Vol. 28(5), 1080-1090, 2017

Qizhe Yang, Guoqiang Li*. Model on Asynchronously Communicating Program Verification Based on Communicating Petri Nets. *Journal of Software (软件学报)*, in Chinese, Vol. 28(4), 804-818, 2017

Cheng Xie, Guoqiang Li, Hongming Cai, Lihong Jiang, Naixue Xiong. Dynamic Weight based Individual Similarity Calculation for Information Searching in Social Computing. *IEEE Systems Journal*, Vol. 11(1), 333-344, 2017

Yue Ding, Dong Wang, Guoqiang Li, Daniel Sun, Xin Xin, Shiyong Qian. Exploiting Long- and Short-term Preferences and RFID Trajectories in Shop Recommendation. *Software: Practice and Experience*, Vol. 47(6), 849-865, 2017

Yonggen Gu, Jie Tao, Guoqiang Li, Daniel Sun, Xiaohong Wu, Padma Sheela Jayaraman and Rajiv Ranjan. A Preemptive Truthful VMs Allocation Online Mechanism in Private Cloud. *Journal of Computational Science*, Vol.17 (3), 647-653, 2016

Yuwei Wang, Guoqiang Li and Shoji Yuen. Nested Timed Automata with Various Clocks. *Science Foundation in China*, Vol. 24(2), 51-68, 2016

Daniel Sun, Min Fu, Liming Zhu, Guoqiang Li and Qinghua Lu. Non-Intrusive Anomaly Detection with Streaming Metrics and Logs for DevOps in Public Clouds. *IEEE Transactions on Emerging Topics in Computing*, Vol. 4(2), 278-289, 2016

Qianqian Duan, Genke Yang, Guoqiang Li. A Hybrid Automation-Based Algorithm for the Short-Term Schedule of Oil Refinery. *International Journal of Oil Gas and Coal Technology*, accepted

Yanlong Li, Guoqiang Li, Xiaoju Dong. A Survey on Visualization of Tree Comparison. *Journal of Software (软件学报)*, Vol. 27 (5), 1074-1090, 2016

Xiaohong Wu, Yonggen Gu, Jie Tao, Guoqiang Li, Prem Prakash Jayaraman, Daniel W. Sun, Rajiv Ranjan, Albert Y. Zomaya, Jingti Han. An Online Greedy Allocation of VMs with Non-increasing Reservations in Clouds. *Journal of Supercomputing*, Vol. 72 (2), 371-390, 2016

Lichao Wang, Guoqiang Li, Zhenjiang Hu. Constructing Format-Preserving Printing from Syntax-Directed Definition. *SCIENCE CHINA Information Sciences*, Vol. 58 (11), 1-14, 2015

Xiaohong Wu, Guoqiang Li. A Game Analysis in Jobs Flow Allocation for SaaS Provider. *Journal of Computational Information Systems*, Vol. 9(22), 8905-8912, 2013

Guoqiang Li, Xiaojuan Cai, Shoji Yuen. Modeling and Analysis of Real-Time Systems with Mutex Components. *International Journal of Foundations of Computer Science (IJFCS)* , Vol. 23(4), 831-851, 2012

Jianzhi Jin, Kaihua Xu, Naixue Xiong, Yuhua Liu, Guoqiang Li. Multi-index Evaluation Algorithm Based on PCA for the Node importance in Complex Networks. *IET networks*, Vol.1(3), 108-115, 2012

Xiuting Tao, Yonggen Gu and Guoqiang Li. A Formal Game-Theoretic Model for Rational Exchange Protocol. *Advanced Materials Research*, Vol. 204-210, 2033-2040, 2011

Conferences and Workshops

Haitao Zhang, Guoqiang Li, Xiaohong Li, Zhuo Cheng, Jinyun Xue, Shaoying Liu. An Efficient Approach for Verifying Automobile Distributed Application Systems on Timing Property. In *Proceedings of the 40th International Conference on Software Engineering (ICSE'18)*, accepted

Congcong Ye, Chun Li, Guoqiang Li, Lihong Jiang, and Hongming Cai. A Behavior Analysis Method Towards Product Quality Management. In *Proceedings of the 11th IFIP WG 8.9 International Conference on Research and Practical Issues of Enterprise Information Systems (CONFENIS'17)* , accepted

Xiuting Tao, Guoqiang Li. The Complexity of Linear-time Temporal Logic Model Repair. In *Proceedings of the 7th International Workshop on SOFL + MSVL (SOFL+MSVL'17)*, accepted

Yi Cui, Guoqiang Li, Hao Cheng, Daoyuan Wang. Indexing for Large Scale Data Querying based on Spark SQL. In *Proceedings of the 14th IEEE International Conference on e-Business Engineering (ICEBE'17)* , accepted

Yuwei Wang, Guoqiang Li, Shoji Yuen. Nested Timed Automata with Invariants. In *Proceedings of the 3rd Symposium on Dependable Software Engineering: Theories, Tools and Applications (SETTA'17)*, accepted

Yuwei Wang, Yunqing Wen, Guoqiang Li, Shoji Yuen. Nested Timed Automata with Diagonal Constraints. In *Proceedings of the 19th International Conference on Formal Engineering Methods (ICFEM'17)*, accepted

- Junli Yang, Bo Song, Bing Yan, Guoqiang Li. A Novel Hidden Markov Model for Genome-Wide Association Studies. In Proceedings of the 3rd IEEE International Workshop on Software Engineering and Knowledge Management (SEKM'17 @ QRS'17), IEEE Society, 500-506, 2017
- Chenxiao Dou, Daniel Sun, Guoqiang Li, Raymond K. Wong. Active Learning with Density-Initialized Decision Tree for Record Matching. In Proceedings of the 29th International Conference on Scientific and Statistical Database Management (SSDBM'17), ACM, 14:1-14:12, 2017
- Yuwei Wang, Xiuting Tao, Guoqiang Li. On Termination and Boundedness of Nested Updatable Timed Automata with One Updatable Clock. In Proceedings of the 6th International Workshop on SOFL + MSVL (SOFL+MSVL'16), LNCS 10189, 15-31, 2016
- Chenxiao Dou, Daniel Sun, Yi-Cheng Chen, Guoqiang Li, Jianquan Liu. Probabilistic Parallelisation of Blocking Non-matched Records for Big Data. In Proceedings of the 3rd International Workshop on Pattern Mining and Application of Big Data (BigData'16), IEEE Society, 3465-3473, 2016
- Ruoyu Wang, Daniel Sun, Guoqiang Li, Muhammad Atif, Surya Nepal. LogProv: Logging Events as Provenance of Big Data Analytics Pipelines with Trustworthiness Evaluation. In Proceedings of the 4th IEEE International Conference on Big Data (BigData'16), IEEE Society, 1402-1411, 2016
- Bingbing Fang, Guoqiang Li, Daniel Sun, Hongming Cai. Schedulability Analysis of Timed Regular Tasks by an Under-Approximation on WCET. In Proceedings of the 2nd Symposium on Dependable Software Engineering: Theories, Tools and Applications (SETTA'16), LNCS 9984, 147-162, 2016
- Ruoyu Wang, Guoqiang Li, Daniel Sun, Jianwen Xiang, Hongming Cai. CAT: A Customized Automata Toolkit. In Proceedings of the 2nd IEEE International Workshop on Software Engineering and Knowledge Management (SEKM'16), IEEE Society, 171-177, 2016
- Haitao Zhang, Zhuo Cheng, Cong Tian, Yonggang Lu, Guoqiang Li. Verifying OSEK/VDX Applications: An Optimized SMT-based Bounded Model Checking Approach. In Proceedings of the 15th IEEE/ACIS International Conference on Computer and Information Science (ACIS-ICIS'16), IEEE Society, IEEE Society, 1-6, 2016
- Guoqiang Li, Mizuhito Ogawa, Shoji Yuen. Nested Timed Automata with Frozen Clocks. In Proceedings of the 13th International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS'15), LNCS 9268, 189-205, 2015
- Yunqing Wen, Guoqiang Li, Shoji Yuen. On Reachability Analysis of Updatable Timed Automata with One Updatable Clock. In Proceedings of the 5th International Workshop on SOFL + MSVL (SOFL+MSVL'15), LNCS 9559, 147-161, 2015
- Ling Fang, Guoqiang Li. Test Selection Using with Equivalence Class Partitioning. In Proceedings of the 2nd International Symposium on Dependable Computing and Internet of Things (DCIT'15), IEEE Society, 40-49, 2015
- Yonggen Gu, Jie Tao, Xiaohong Wu, Guoqiang Li, Jingyu Chen, Xiaolong Ma. A Preemptive Truthful VMs Allocation Online Mechanism in Private Cloud. In Proceedings of the 2nd International Symposium on Dependable Computing and Internet of Things (DCIT'15), IEEE Society, 80-86, 2015
- Bingbing Fang, Guoqiang Li, Ling Fang, Jianwen Xiang. A Refined Algorithm for Reachability Analysis of Updatable Timed Automata. In Proceedings of the 1st IEEE International Workshop on Software Engineering and Knowledge Management (SEKM'15), IEEE Society, 230-236, 2015
- Yunqing Wen, Guoqiang Li, Shoji Yuen. An Over-Approximation Forward Analysis for Nested Timed Automata. In Proceedings of the 4th International Workshop on SOFL + MSVL (SOFL+MSVL'14), LNCS 8979, 62-80, 2014
- Ling Fang, Guoqiang Li, Yingjie You, Chaobin Chen, Liqin Hu. Toward SIL Evaluation for A Resilience Strategy. In Proceedings of 4th the International Workshop on Open Systems Dependability (WOSD'14), IEEE Society, 473-477, 2014
- Xiaohong Wu, Yonggen Gu, Guoqiang Li, Xiaolong Ma, Jie Tao. Online Mechanism Design for VMs allocation in Private Cloud. In Proceedings of the 11th IFIP International Conference on Network and Parallel Computing (NPC'14), LNCS 8707, 234-246, 2014

- Guoqiang Li, Xiaojuan Cai, Mizuhito Ogawa, Shoji Yuen. Nested Timed Automata. In Proceedings of the 11th International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS'13), LNCS 8053, 168-182, 2013
- Xiaohong Wu, Yonggen Gu, Guoqiang Li. Game Analysis of Workload Factoring with the Hybrid Cloud. In Proceedings of the 5th International Workshop on Parallel and Distributed Algorithms and Applications (PDAA'13 @ CANDAR'13), IEEE Society, 2013
- Yizhou Zhang, Hao Lin, Guoqiang Li. Emerald: An Automated Modeling and Verification Tool for Component-Based Real-Time Systems. In Proceedings of the 12th International Conference on Quality Software (QIS-C'12), IEEE Society, 120-123, 2012
- Guoqiang Li. Measuring Time Lag with Nested Preemptions and Resumptions. In Proceedings of the 1st International Workshop on Formal Methods for Real-Time Distributed Systems (FORDS'12 @ ISORC'12), IEEE Society, 19-24, 2012
- Jianxin Xue, Huan Long, Guoqiang Li. An Improved Full Abstraction Approach to Analyzing Locality Semantics. In Proceedings of the 6th IEEE International Symposium on Theoretical Aspects of Software Engineering (TASE'12), IEEE Society, 101-108, 2012
- Guoqiang Li, Yonggen Gu, Xiuting Tao, and Jie Tao. A Game Theoretic Model and Tree Analysis Method for Fair Exchange Protocols. In Proceedings of the 5th IEEE International Symposium on Theoretical Aspects of Software Engineering (TASE'11), IEEE Society, 243-246, 2011
- Guoqiang Li, Xiaojuan Cai, Shoji Yuen. Modeling and Analysis of Real-Time Systems with Mutex Components. In Proceedings of the 24th IEEE International Parallel and Distributed Processing Symposium, Workshops and Phd Forum (APDCM'10 @ IPDPS'10), IEEE Society, 1-8, 2010
- Huaiyang Zhou, Guoqiang Li. Modelling and Analysis of Real-time Systems on Multi-Core Processors. In Proceedings of the 2nd International Conference on Information Science and Engineering (ICISE'10), IEEE Society, 2010
- Fei Yu, Guoqiang Li, Naixue Xiong. Schedulability Analysis of Multi-Processor Real-Time Systems using UPPAAL. In Proceedings of the 2nd International Conference on Information Science and Engineering (ICISE'10), IEEE Society, 2010
- Chen Chu, Guoqiang Li. An Efficient Algorithm for Automatic Equational Unifier Generator. In Proceedings of the 2nd International Conference on Progress in Informatics and Computing conference (PIC'10), IEEE Society, 2010
- Guoqiang Li, Mizuhito Ogawa. Authentication Revisited: Flaw or Not, the Recursive Authentication Protocol. In Proceedings of the 6th International Symposium on Automated Technology for Verification and Analysis (ATVA'08), LNCS 5311, 374-385, 2008
- Guoqiang Li, Mizuhito Ogawa. On-the-fly Model Checking of Fair Non-repudiation Protocols. In Proceedings of the 5th International Symposium on Automated Technology for Verification and Analysis (ATVA'07), LNCS 4762, 511-522, 2007

Academic Activities

Local Chair

The 2nd National Conference on Formal Methods and Applications (FMAC'17)

The NSFC-JSPS Joint Workshop on Formal Methods (2008-2016)

The Eighth Asian Workshop on Foundation of Software (AWFS'10)

PC Member

YR-SETTA'17 | DSA'17 | ICFEM'17 | SOFL+MSVL'17 | TASE'17 | SEKM'17 | ICA3PP'17 | APDCM'17
| APDCM'17

FMAC'16 | YR-SETTA'16 | IS3R'16 | ICEBE'16 | SEKM'16 | SOFL+MSVL'16 | CANDAR'16 | PDAA'16
| APDCM'16 | D2D'16

YR-SETTA'15 | CANDAR'15 | DCIT'15 | SEKM'15 | APDCM'15 | HASE'15

CANDAR'14 | APDCM'14

PDAA'13 | CANDAR'13 | APDCM'13

PDAA'12 | ICNC'12 | FORDS'12 | APDCM'12

PDAA'11 | ICNC'11 | APDCM'11

PDAA'10