Prof. Shengchao Qin

CURRICULUM VITAE

PERSONAL RECORD

- ✧ Full Name: Shengchao Qin
- ✧ Present academic employment:
  - Research Professor (Chair) (since 1.10.2019), School of Computing, Engineering & Digital Technologies, Teesside University
  - Professor of Computer Science (since 1.6.2011), School of Computing, Teesside University
  - Visiting Professor (since 1.6.2018), Shenzhen University
- ✧ Further/Higher Education
  - PGCert in Learning and Teaching in Higher Education, Durham University (2006)
  - Ph.D, Peking University (9.1997 - 6. 2002) (Advisors: Jifeng He, Zongyan Qiu, Naixiao Zhang)
  - BSc, Peking University (9.1993 - 6. 1997)
- ✧ Qualifications and Professional Memberships
  - Ph.D (2002), BSc (1st Honour, 1997)
  - PGCert (2006)
  - Professional member of IEEE-CS, ACM, ACM-SIGPLAN, and BCS
  - Fellow of Higher Education Academy, UK
  - Full Member of EPSRC Peer Review College
  - Member of UKRI Future Leaders Fellowship Peer Review College
- ✧ Previous academic employment
  - Associate Dean for Research and Innovation (1.8.2016 - 30.9.2019) for
    - School of Computing & Digital Technologies (1.3.2019-30.9.2019), Teesside University
    - School of Computing, Media & the Arts (1.8.2017-28.2.2019), Teesside University
    - School of Computing (1.8.2016-31.7.2017), Teesside University
  - Professor of Computer Science (since 1.6.2011), School of Computing, Teesside University
  - Adjunct Professor (1.6.2013 - 31.5.2018), Shenzhen University
  - Acting Director of Digital Research (1.2.2016-31.7.2016), Teesside University
  - Reader in Computer Science (1.6.2010 - 31.5.2011), Teesside University
  - Lecturer in Computer Science (1.1. 2005 - 31.5.2010), Durham University
  - Research Fellow (7.2002-12.2004), Singapore-MIT Alliance (based at National University of Singapore)
  - Fellow (9.1999-8.2000), International Institute for Software Technology, United Nations University

RESEARCH GRANTS AWARDS

I have been the PI for a couple of UK EPSRC research grants. I have also been the PI or Co-I for several NSFC research grants. I have also obtained some other grants for Ph.D studentships.

- NSFC Key Project Grant (61836005): Human-Like Task Planning, Reasoning and Verification Systems and Applications (1.2019 - 12.2023). CNY 2,870,000. (2nd **Co-I**)
- NSFC Standard Grant (61772347): Formal Semantic Models, Analysis and Verification Techniques for Weak Memory Programs (1.2018-12.2021). CNY 610,000 (**PI**)
- NSFC Standard Grant (61373033): Resource-Aware Program Logic Theories and Resource Safety Reasoning (1.2014-12.2017). CNY 750,000 (**PI**)
- EPSRC Grant EP/G042322: Inference Mechanisms for a Separation and Numerical Domain. *10/2009–12/2013*. Total value: £488,899 (RC contribution: £403,535). (**PI**)
- EPSRC Grant EP/E021948: Resource Analysis and Verification for Dependable Embedded Software. *2.2007-7.2010*. Total value: £252,627 (RC contribution: £213, 681). (**PI**)
- Teesside International Visitor Award. £4,582. 2011
- EPSRC Doctoral Training Award (10.2009 - 3.2013). £64,500. (**PI**)
- NSFC Grant: Object Encapsulation and Protection in OO: Theories and Techniques. 2008-2010. CNY 500,000. (**Co-I**)
- NSFC Grant: Formal Models for Web Service Choreography Description Languages. 2008-2010. CNY 300,000. (**Co-I**)
- Durham Doctoral Fellowship Grant. (10.2007-9.2010). £73,020. (**PI**)
- London Mathematical Society Small Grant. £500. 2006. (**PI**)
- NSFC Grant: Real-Time Embedded Systems Design. 2001-2003. CNY 240,000.(**Co-I**)
- Peking University Grant for Creative Ph.D Thesis Work. 2000-2002. CNY 10,000. (**PI**)

Since I stepped down from the senior management role on 1st Oct., I've been planning on the following grant proposals:

- Leverhulme Trust Research Fellowship application (PI, 7 Nov 2019, cap at £55k)
- Innovate UK KTP bid with Charles Clinkard (Academic Lead, Dec 2019, ca £200K)
- EPSRC standard grant on Hybrid-Event B reasoning mechanisms (joint with Manchester and Southampton) (Co-PI, August 2020, ca £350K)
- EPSRC standard grant on memory vulnerabilities detection (PI, Dec 2020, ca £400K)

RESEARCH SUPERVISIONS AND EXAMINERSHIPS

I have supervised many research students to completion. I have also supervised three postdoctoral research associates and have had a number of examiner-ships.

- Research Students Supervision (6 PhD completions as 1st supervisor)
  - Patricia Shaw, PhD completed in 2009 (2nd supervisor)
  - Chenguang Luo, Ph.D completed in 2010 (1st supervisor)
  - Guanhua He, Ph.D completed in 2011 (1st supervisor)
  - Wei Xiong, Ph.D completed in 2012 (1st supervisor)
  - Granville Barnett, Ph.D completed in 2012 (1st supervisor)
  - Ryuta Arisaka, Ph.D completed in 2013 (1st supervisor)
  - Mengda He, PhD completed in 2017 (1st supervisor)
  - Chris Curry, PhD student started in 2017 (co-supervisor)

  - Yang Liu, PhD student started in 2017 (co-supervisor)
  - Thomas Hayton, PhD student completed in 2019 (co-supervisor)
  - Colin Joy, PhD student started in 2017 (co-supervisor)
  - Ndidi Ogbo, PhD student started in 2017 (co-supervisor)
  - Chidimma Opara, PhD student started in 2017 (co-supervisor)
  - Mohammed Suleiman, PhD student started in 2017 (co-supervisor)
  - Stephen Varey, PhD student started in 2017 (co-supervisor)
  - Elisabeth Yaneske, PhD student started in 2017 (co-supervisor)
  - Zhang Zhang, PhD student started in 2015 (co-supervisor)
  - Satish Shewhorak, PhD student completed in 2018 (co-supervisor)
  - Cheng Wen, PhD student started in 2019 (SZU) (1st supervisor)

- Postdoc/RA Supervision
  - Dr. Florin Craciun, Mar 2008 - Mar 2009
  - Dr. Aziem Chawdhary, Oct 2009 - Mar 2013
  - Dr. Joao F. Ferreira, Feb 2011 - Aug 2011
  - Dr. Guanhua He, Mar 2011 - Dec 2013
  - Dr. Haijun Wang, Oct 2018 - Sep 2019
  - Dr. Yida Tao, Sep 2018 - Dec 2021
  - Dr Mengda He, Sep 2017 - Aug 2022

- Research Examinerships
  - PhD (University of Southampton), 2019.12
  - PhD (Gerard Ekembe Ngondi, University of York) , 2016.10
  - PhD (Sanjeev Kumar Das, Nanyang Technological University, Singapore), 2016.8
  - PhD (Riccardo Bresciani, Trinity College Dublin), 2013. 6
  - PhD (Angel Robert Lynas, Teesside)
  - PhD (Nick Brown, Durham)
  - MSc by Research (Shukang Han, Durham)

RESEARCH PUBLICATIONS

My research areas to date include formal methods, programming languages, software verification and validation, cybersecurity, and cyber-physical systems, with a key focus on the safety, reliability, dependability, and security of software and systems. I have produced, to date, over 110 peer-reviewed publications in top quality and reputable journals and high quality international conferences, e.g. IEEE TSE, IEEE Trans on Reliability, ACM SIGPLAN POPL, ACM SIGPLAN PLDI, CAV, ACM/IEEE ICSE, ESEC/FSE, FM, etc, with a number of high quality outputs currently in the pipeline under submission/review. My citation count as on 1 Oct 2019 is 1716, according to Google Scholar with h-index 21 and i10-index 39. Most of my publications are listed below, with most of them also accessible at `https://www.scm.tees.ac.uk/s.qin/publication.html` and the DBLP database at `https://dblp.uni-trier.de/pers/hd/q/Qin:Shengchao`. My ORCID page is at `https://orcid.org/0000-0003-3028-8191`.

I have contributed to UK Research Assessment Exercise (RAE) 2008 in Durham University and Research Excellence Framework (REF) 2014 in Teesside University. Under my recent role as Associate Dean (Research & Innovation) in a multi-disciplinary school, I was leading on two units of assessment submissions for REF 2021. Under my current role, I am coordinating UoA11 submission for REF2021.

In the current REF cycle, I have produced 40 peer-reviewed papers in high quality journals and conferences, with 3 more papers under review. In the external review conducted by a REF2014 UoA11 sub-panelist from University of Durham, among the 16 papers submitted for review ([1-17]), *3 papers are rated as solid 4* (i.e. world leading), 2 papers are rated as 3*/4*, 11 papers are rated as solid 3* (i.e. internationally excellent)*. Here is the extract of the external reviewer's comments for one of the 4-star rated papers:

"There are aspects of originality associated with this research with significant novelty encompassed within the LAR methodology. This methodology is substantial and the evaluation of it is detailed and comparative and has depth. Overall, this is a very strong paper with excellent potential for significance. It is a clear 4 paper."*

✧ Refereed Journal/Conference Papers (post-2014)

1. (**4***) J. Wang, J. Sun, S. Qin and C. Jegourel. Automatically 'Verifying' Discrete-Time Complex Systems through Learning, Abstraction and Refinement. *IEEE Transactions on Software Engineering*. (DOI: 10.1109/TSE.2018.2886898). (external review rating: **4 star**)
2. (**4***) T. C. Le, S. Qin, W.-N. Chin: Termination and non-termination specification inference. ACM SIGPLAN PLDI 2015: 489-498 (external review rating: **4 star**)
3. (**4***) Q. L. Le, C. Gherghina, S. Qin, W.-N. Chin: Shape Analysis via Second-Order Bi-Abduction. CAV 2014: 52-68 (external review rating: **4 star**)
4. (**3*/4***) X. Wang, J. Sun, T. Wang, S Qin: Language Inclusion Checking of Timed Automata with Non-Zenoness. *IEEE Transactions on Software Engineering*. 43(11):995-1008 (2017). (external review rating: **3/4 star**)
5. (**3*/4***) H. Zhu, J. He, S. Qin, P. J. Brooke: Denotational semantics and its algebraic derivation for an event-driven system-level language. *Formal Aspects of Computing*. 27(1): 133-166 (2015). (external review rating: **3/4 star**)
6. (**3***) H. Wang, X. Xie, S.-W. Lin, Y. Lin, Y. Li, S. Qin, Y. Liu and T. Liu. Locating Vulnerabilities in Binaries via Memory Layout Recovering. The 27th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE). Tallinn, Estonia. 26-30 Aug 2019. (Core A* and top-tier conference in SE; not reviewed yet but expected to be at least **3 star**)
7. (**3***) Z. Xu, C. Wen and S. Qin. Type Learning for Binaries and its Applications. *IEEE Transactions on Reliability*. (DOI: 10.1109/TR.2018.2884143) (external review rating: **3 star**)
8. (**3***) J. Wang, J. Sun, Y. Jia, S. Qin, Z. Xu. Towards 'Verifying' a Water Treatment System. 22nd International Symposium on Formal Methods (FM 2018), 15-17 July 2018, Oxford, UK. (external review rating: **3 star**)
9. (**3***) Z. Xu, C. Wen, S. Qin. State-taint analysis for detecting resource bugs. *Science of Computer Programming*. Elsevier. 162:93-109 (2018). (external review rating: **3 star**)
10. (**3***) Q. L. Le, J. Sun, S. Qin. Frame Inference for Inductive Entailment Proofs in Separation Logic. 24th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2018). LNCS 10805. Pages 41-60. Thessaloniki, Greece. 14-20 April 2018. (external review rating: **3 star**)
11. (**3***) L. Shi, Y. Zhao, Y. Liu, J. Sun, J. S. Dong, and S. Qin. A UTP semantics for communicating processes with shared variables and its formal encoding in PVS. *Formal Aspects of Computing*. 30(3-4):351-380. 2018. (external review rating: **3 star**)
12. (**3***) S. Qin, G. He, W.-N. Chin, F. Craciun, M. He, Z. Ming: Automated specification inference in a combined domain via user-defined predicates. *Science of Computer Programming*. 148: 189-212 (2017). (external review rating: **3 star**)
13. (**3***) R. Banach, M. J. Butler, S. Qin, H. Zhu: Core Hybrid Event-B II: Multiple cooperating Hybrid Event-B machines. *Science of Computer Programming*. 139: 1-35 (2017) (external review rating: **3 star**)
14. (**3***) Y. Zeng, X. Chen, G. Cong, S. Qin, J. Tang, Y. Xiang: Maximizing influence under influence loss constraint in social networks. *Expert Systems with Applications*. 55 (2016) 255-267. Elsevier. (external review rating: **3 star**)
15. (**3***) R. Banach, M. J. Butler, S. Qin, N. Verma, H. Zhu: Core Hybrid Event-B I: Single Hybrid Event-B machines. *Science Computer Programming*. 105: 92-123 (2015). Elsevier. (external review rating: **3 star**)

16. (**3***) J. Sun, H. Xiao, Y. Liu, S.-W. Lin, S. Qin: TLV: abstraction through testing, learning, and validation. ACM ESEC/SIGSOFT FSE 2015: 698-709 (external review rating: **3 star**)
17. (**3***) S. Qin, G. He, C. Luo, W.-N. Chin, H. Yang: Automatically refining partial specifications for heap-manipulating programs. *Sci. Comput. Program.* 82: 56-76 (2014) (external review rating: **3 star**)

Note: *The following papers were not submitted for REF external review, hence no rating*:

18. L. H. Pham, Q. L. Le, Q.-S. Phan, J. Sun and S. Qin. Enhancing Symbolic Execution of Heap-based Programs with Separation Logic for Test Input Generation. International Symposium on Automated Technology for Verification and Analysis (ATVA 2019). 28-31 October 2019. Taipei.
19. Y. Fei, H. Zhu, X. Wu, H. Fang, S. Qin. Comparative modelling and verification of Pthreads and Dthreads. *Journal of Software: Evolution and Process* 30(3) (2018).
20. M. He, S. Qin and J. Ferreira. Towards a Program Logic for C11 Release Sequences. The 12th International Symposium on Theoretical Aspects of Software Engineering (TASE 2018). Guangzhou, China. 29-31 August 2018.
21. Z. Xu, K. Ren, S. Qin and F. Craciun. CDGDroid: Android Malware Detection Based on Deep Learning using CFG and DFG. The 20th International Conference on Formal Engineering Methods (ICFEM 2018). Gold Coast, Australia. 12-16 November 2018.
22. W. Xie, H. Zhu and S. Qin. UTP Semantics for BigrTiMo. The 20th International Conference on Formal Engineering Methods (ICFEM 2018). Gold Coast, Australia. 12-16 November 2018.
23. A. Costea, W.-N. Chin, S. Qin and F. Craciun. Automated Modular Verification for Relaxed Communication Protocols. The 16th Asian Symposium on Programming Languages and Systems (APLAS). Wellington, New Zealand. 2-6 Dec 2018.
24. F. Craciun, W.-N. Chin and S. Qin. Variant Region Types. The 23rd International Conference on Engineering of Complex Computer Systems (ICECCS 2018). Melbourne, Australia. 12-14 December 2018.
25. J. Wang, X. Chen, J. Sun, and S. Qin. Improving Probability Estimation through Active Probabilistic Model Learning. 19th International Conference on Formal Engineering Methods. Xi'an, China. 13-17th Nov 2017.
26. Z. Xu, C. Wen, and S. Qin. Learning Types for Binaries. 19th International Conference on Formal Engineering Methods. Xi'an, China. 13-17th Nov 2017.
27. H. Jiang, H. Yang, S. Qin, Z. Su, Jian Zhang, and J. Yan. Detecting Energy Bugs in Android Apps Using Static Analysis. 19th International Conference on Formal Engineering Methods. Xi'an, China. 13-17th Nov 2017.
28. C. Mu and S. Qin. Time-sensitive Information Flow Control in Timed Event-B. 11th International Symposium on Theoretical Aspects of Software Engineering (TASE 2017). Sophia Antipolis, France. 13-15 September 2017.
29. C. Huang, X. Chen, Y. Zhang, S. Qin, Y. Zeng, X. Li. Switched Linear Multi-Robot Navigation Using Hierarchical Model Predictive Control. International Joint Conference on Artificial Intelligence (**IJCAI**-17). Melbourne. 19-25th August 2017.
30. C. Huang, X. Chen, Yi. Zhang, S. Qin, Y. Zeng, X. Li. Hierarchical Model Predictive Control for Navigation of Multi-Robot Systems. International Joint Conference on Artificial Intelligence (IJCAI-16). New York City. 9-15th July 2016.
31. M. He, V. Vafeiadis, S. Qin and J. F. Ferreira. Reasoning about Fences and Relaxed Atomics. 24th Euromicro International Conference on Parallel, Distributed Systems. February 2016. The IEEE Press.
32. Z. Xu, D. Fan, S. Qin: State-Taint Analysis for Detecting Resource Bugs. 10th International Symposium on Theoretical Aspects of Software Engineering (TASE 2016). Pages 168-175.
33. Z. Wu, Y. Xu, A. Gunay, Y. Liu, S. Qin. Concurrent On-the-Fly SCC Detection for Automata-Based Model Checking with Fairness Assumption. 21st International Conference on Engineering of Complex Computer Systems (ICECCS 2016). Pages 135-144.

34. H. Pang, J. Li, Y. Ruan, Y. Huang, J. Shi, S. Qin. Formalization and Verification of the Powerlink Protocol Using CSP. 23rd Asia-Pacific Software Engineering Conference (APSEC 2016). Pages 321-328.
35. Y. Huang, J. He, H. Zhu, Y. Zhao, J. Shi, S. Qin: Semantic theories of programs with nested interrupts. *Frontiers of Computer Science* 9(3): 331-345 (2015)
36. X. Chen, Y. Zeng, G. Cong, S. Qin, Y. Xiang, Y. Dai: On Information Coverage for Location Category Based Point-of-Interest Recommendation. **AAAI** 2015: 37-43
37. Y. Zeng, X. Chen, X. Cao, S. Qin, M. Cavazza, Y. Xiang: Optimal Route Search with the Coverage of Users' Preferences. **IJCAI** 2015: 2118-2124
38. C. Gherghina, C. David, S. Qin, W-N Chin: Expressive program verification via structured specifications. *International Journal on Software Tools for Technology Transfer*. 16(4): 363-380 (2014)
39. J. F. Ferreira, C. Gherghina, G. He, S. Qin, W-N Chin: Automated verification of the FreeRTOS scheduler in Hip/Sleek. *International Journal on Software Tools for Technology Transfer*. 16(4): 381-397 (2014)
40. K. Ma, J. Wang, H. Yang, J. Yan, J. Zhang, S. Qin: Choreography Scenario-Based Test Data Generation. TASE 2014: 70-73

✧ Refereed Journal/Conference Papers (pre-2014)

41. H. Yang, C. Cai, L. Peng, X. Zhao, Z. Qiu, S. Qin: Algorithms for checking channel passing in web service choreography. Frontiers of Computer Science 7(5): 710-728 (2013)
42. S. Qin, G. He, C. Luo, W.-N. Chin, X. Chen: Loop invariant synthesis in a combined abstract domain. Journal of Symbolic Computation. 50: 386-408 (2013). Elsevier.
43. M. Yang, Z. Wang, G. Pu, S. Qin, B. Gu, J. He: The stochastic semantics and verification for periodic control systems. SCIENCE CHINA Information Sciences 55(12): 2675-2693 (2012)
44. H. Zhu, F. Yang, J. He, J. P. Bowen, J. W. Sanders, S. Qin: Linking operational semantics and algebraic semantics for a probabilistic timed shared-variable language. Journal of Logic and Algebraic. Programming. 81(1): 2-25 (2012)
45. W.-N. Chin, C. David, H. H. Nguyen, and S. Qin. Automated Verification of Shape, Size and Bag Properties via User-Defined Predicates in Separation Logic. *Science of Computer Programming*. 77(9):1006-1036. 2012. Elsevier.
46. C. Luo, F. Craciun, S. Qin , G. He, and W.-N. Chin. Verifying Pointer Safety for Programs with Unknown Calls. *Journal of Symbolic Computation*. 45(11):1163-1183. Elsevier.
47. H. Zhu, S. Qin , J. He, and J. P. Bowen, PTSC: Probability, Time and Shared-Variable Concurrency. *International Journal on Innovations in Systems and Software Engineering*. 5(4):271-284, 2009. Springer. ISSN: 1614-5046.
48. J. S. Dong, P. Hao, S. Qin , J. Sun and W. Yi. Timed Automata Patterns. *IEEE Transactions on Software Engineering*. 34 (6): 844-859. 2008.
49. C. Luo, S. Qin , and Z. Qiu, Verifying BPEL-like Programs with Hoare Logic. *Frontiers of Computer Science in China*. 2(4):344-356. 2008. ISSN: 1673-7350.
50. C. Luo and S. Qin , Separation Logic for Multiple Inheritance. *Electronic Notes in Theoretical Computer Science*. 212: 27-40 (2008).
51. S. Qin , W.-N. Chin, J. He, and Z. Qiu, From Statecharts to Verilog: a Formal Approach to Hardware/Software Co-Specification. *International Journal on Innovations in Systems and Software Engineering*. 2(1) :17-38. 2006. Springer. ISSN: 1614-5046.
52. S. Qin , J. He, Z. Qiu, and N. Zhang, An Algebraic Hardware/Software Partitioning Algorithm. *Journal of Computer Science and Technology*. 17(3):284–294. May, 2002.
53. G. Barnett, S. Qin: Data-Race-Freedom of Concurrent Programs. APSEC (1) 2013: 272-279
54. P. Liu, H. Zhu, S. Qin, P. J. Brooke, X. Wu: Linking the Semantics of BPEL Using Maude. APSEC (1) 2013: 422-431
55. S. Qin, G. He, W-N Chin, H. Yang: Invariants Synthesis over a Combined Domain for Automated Program Verification. Theories of Programming and Formal Methods 2013: 304-325

56. L. Zou, N. Zhan, S. Wang, M. Franzle, S. Qin. Verifying Simulink diagrams via a Hybrid Hoare Logic Prover. EMSOFT 2013: 9:1-9:10

57. P. Liu, H. Zhu, S. Qin, P. J. Brooke, X. Wu: Linking Algebraic Semantics and Operational Semantics for Web Services Using Maude. ICECCS 2013: 260-263

58. Y. Huang, J. F. Ferreira, G. He, S. Qin, J. He: Deadline Analysis of AUTOSAR OS Periodic Tasks in the Presence of Interrupts. ICFEM 2013: 165-181

59. L. Shi, Y. Zhao, Y Liu, J Sun, J S Dong, S. Qin: A UTP Semantics for Communicating Processes with Shared Variables. ICFEM 2013: 215-230

60. G. He, S. Qin, W-N Chin, F. Craciun: Automated Specification Discovery via User-Defined Predicates. ICFEM 2013: 397-414 2012

61. G. Barnett, S. Qin: A Composable Mixed Mode Concurrency Control Semantics for Transactional Programs. ICFEM 2012: 38-53

62. Y. Huang, Y. Zhao, J. Shi, H. Zhu, S. Qin: Investigating Time Properties of Interrupt-Driven Programs. SBMF 2012: 131-146

63. H. Zhu, Q, Xu, C. Ma, S. Qin, Z. Qiu: The Rely/Guarantee Approach to Verifying Concurrent BPEL Programs. SEFM 2012: 172-187

64. Y. Huang, Y. Zhao, S. Qin, G. He, J. F. Ferreira: A Timed CSP Model for the Time-Triggered Language Giotto. SEW 2012: 110-119

65. J. F. Ferreira, G. He, S. Qin: Automated Verification of the FreeRTOS Scheduler in HIP/SLEEK. TASE 2012: 51-58

66. G. Barnett, S. Qin: Moverness for Locks and Transactions. TASE 2012: 185-192

67. R. Arisaka, S. Qin: LBI Cut Elimination Proof with BI-MultiCut. TASE 2012: 235-238

68. H. Zhu, P. Liu, J. He, S. Qin: Mechanical Approach to Linking Operational Semantics and Algebraic Semantics for Verilog Using Maude. UTP 2012: 164-185

69. H. Zhu, J. W. Sanders, J. He, S. Qin: Denotational Semantics for a Probabilistic Timed Shared-Variable Language. UTP 2012: 224-247

70. Z. Wang, G. Pu, J. Li, J. He, S. Qin, K. G. Larsen, J. Madsen, B. Gu: MDM: A Mode Diagram Modeling Framework. FTSCS 2012: 135-149

71. S. Qin, C. Luo, W.N. Chin, and G. He. Automatically Refining Partial Specifications for Program Verification. *Formal Methods (FM 2011)*. Lecture Notes in Computer Science. Springer.

72. C. Gherghina, C. David, S. Qin, and W.N. Chin. Structured Specifications for Better Verification of Heap-Manipulating Programs. *Formal Methods (FM 2011)*. Lecture Notes in Computer Science. Springer.

73. W.-N. Chin, C. Gherghina, R. Voicu, Q. L. Le, F. Craciun and S. Qin. A Specialization Calculus for Pruning Disjunctive Predicates to Support Verification. *Computer-Aided Verification (CAV 2011)*. Lecture Notes in Computer Science. Springer.

74. S. Qin, A. Chawdhary, W. Xiong, M. Munro, Z. Qiu, H. Zhu: Towards an Axiomatic Verification System for JavaScript. IEEE International Symposium on Theoretical Aspects of Software Engineering. 2011: 133-141

75. S. Qin, G. He, C. Luo, and W.-N. Chin. Loop Invariant Synthesis in a Combined Domain. Formal Methods and Software Engineering (ICFEM2010). Shanghai, China. November 2010. Lecture Notes in Computer Science. Springer.

76. S. Qin, C. Luo, G. He, F. Craciun, and W.-N. Chin. Verifying Heap-Manipulating Programs with Unknown Procedure Calls. Formal Methods and Software Engineering (ICFEM2010). Shanghai, China. November 2010. Lecture Notes in Computer Science. Springer.

77. S. Wang, Z. Qiu, S. Qin, and W.-N. Chin. Stack Bound Inference for Abstract Java Bytecode. The 4th IEEE International Symposium on Theoretical Aspects of Software Engineering (TASE 2010), Taipei, August 24 - 27, 2010.

78. G. He, S. Qin, C. Luo and W.N. Chin. Memory Usage Verification using HIP/SLEEK. *The International Symposium on Automated Technology for Verification and Analysis (ATVA09)*. Lecture Notes in Computer Science. Volume 5799. Pages 166-181. Springer. 2009.

79. F. Craciun, W.-N. Chin, G. He, and S. Qin. An Interval-based Inference of Variant Parametric Types. *18th European Symposium on Programming (ESOP09)*. Lecture Notes in Computer Science. Volume 5502. Pages 112–127. 2009.

80. C. Luo, G. He, and S. Qin. A Heap Model for Java Bytecode to Support Separation Logic. *The 15th Asia-Pacific Software Engineering Conference(APSEC08)*. Pages 127–134. The IEEE CS Press. 2008.

81. F. Craciun, S. Qin, and W.-N. Chin. A Formal Soundness Proof of Region-based Memory Management for Object-Oriented Paradigm. *Formal Methods and Software Engineering (ICFEM08)*.Lecture Notes in Computer Science, Volume 5256. Pages 126-146. 2008.

82. C. Luo, S. Qin, and Z. Qiu, Verifying BPEL-like Programs with Hoare Logic. *The 2nd IEEE/IFIP International Symposium on Theoretical Aspects of Software Engineering (TASE08)*. Pages 151–158. The IEEE CS Press. 2008.

83. W.-N. Chin, H.H. Nguyen, C. Popeea, and S. Qin, Analysing Memory Resource Bounds for Low-Level Programs. *The International Symposium on Memory Management (ISMM08)*. Pages 151–160. The ACM Press. 2008.

84. W.-N. Chin, C. David, H. H. Nguyen, and S. Qin. Enhancing Modular OO Verification with Separation Logic. *The 35th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL08)*. Pages 87–99. The ACM Press. 2008.

85. W.-N. Chin, C. David, H. H. Nguyen, and S. Qin. Multiple Pre/Post Specifications for Heap-Manipulating Methods. *10th IEEE High Assurance Systems Engineering Symposium (HASE07)*. Pages 357–364. The IEEE CS Press. 2007.

86. W.-N. Chin, C. David, H. H. Nguyen, and S. Qin. Automated Verification of Shape, Size and Bag Properties. *12th IEEE International Conference on Engineering of Complex Computer Systems (ICECCS07)*. Pages 307-320. The IEEE CS Press. ISBN: 0-7695-2895-3. 2007.

87. S. Qin and G. He, Linking Object-Z with Spec#. *12th IEEE International Conference on Engineering of Complex Computer Systems (ICECCS07)*. Pages 185-196.The IEEE CS Press. ISBN: 0-7695-2895-3. 2007.

88. H. H. Wang, S. Qin, J. Sun and J. S. Dong, Realizing Live Sequence Charts in SystemVerilog. *1st IEEE/IFIP International Symposium on Theoretical Aspects of Software Engineering (TASE07)*. Pages 379-388. The IEEE CS Press. ISBN: 978-0-7695-2856-4. 2007.

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108. B. Chen, Y. Liu, X. Peng, Y. Wu, X. Wang, S. Qin: Baton: Symphony of Random Testing and Concolic Testing through Machine Learning and Taint Analysis. Under consideration by *Automated Software Engineering*.
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✧ Edited Books

111. Y. Ait Ameur and S. Qin. Formal Methods and Software Engineering. The 21st International Conference on Formal Engineering Methods. Springer. 2019

112. D. Mery and S. Qin . Theoretical Aspects of Software Engineering, the Thirteen IEEE International Symposium. IEEE Computer Society 2019. To appear.
113. S. Qin and Z. Qiu . Formal Methods and Software Engineering. The 13th International Conference on Formal Engineering Methods. Springer.
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115. W. N. Chin and S. Qin . Theoretical Aspects of Software Engineering, the Third IEEE International Symposium. IEEE Computer Society 2009.

✧ Other Publications

116. H. H. Nguyen, W. N. Chin, S. Qin and M. Rinard. Memory Usage Inference for Object-Oriented Programs, Singapore-MIT Alliance Symposium, January 2005.
117. W. N. Chin, S. Qin and M. Rinard. Region Type Checking for Core-Java, Singapore-MIT Alliance Symposium, January 2004.
118. S. Qin, J. He, and W. N. Chin. Towards An Automated Approach to Hardware/Software Decomposition, Singapore-MIT Alliance Symposium, January 2003.

✧ Technical Reports/Monographs/Thesis

119. S. Qin, C. Luo, W.-N. Chin, and G. He. Automatically Refining Partial Specifications for Program Verification. Technical Report. School of Computing, Teesside University. January 2011
120. F. Craciun, W.-N. Chin, G. He, and S. Qin. An Interval-based Inference of Variant Parametric Types. Technical Report. Department of Computer Science, Durham University. December, 2008.
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123. W.-N. Chin, H. H. Nguyen, S. Qin, and Martin Rinard. Predictable Memory Usage for Object-Oriented Programs. Technical Report, November, 2004. School of Computing, National University of Singapore.
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132. S. Qin. An Algebraic Approach to Hardware/Software Partitioning in Hardware/Software Co-Design. Ph.D Thesis. School of Mathematical Sciences. Peking University. 2002.

RESEARCH ESTEEM INDICATORS

I have held a number of invited research visits and have given a number of invited lectures. I have been involved in various international conference committees. I chair the program committee of the following international conferences: TASE2009, UTP 2010, ICFEM 2011, ICFEM 2019, TASE2019. I have served in the program committee for more than 50 international conferences. I have a good number of excellent international research collaborators.

- Full Member of UK EPSRC Peer Review College (reviewing around 7 proposals p.a. incl. programme grants)
- Member of UKRI Future Leader Fellowships Peer Review College
- Invited Research Visits
  - Research Visit, Cybersecurity Lab, Nanyang Technological University, Singapore (Jul - Aug 2018)
  - Senior Visiting Research Fellowship, National University of Singapore (July-Oct 2010)
  - Research Visits, Peking University and Each China Normal University (Sep-Oct, 2008)
  - Senior Visiting Research Fellowship, National University of Singapore. (Aug-Sept 2005)
  - Research Visit, MIT, (May 2005)
  - Research Visit, UNU/IIST, (Nov-Dec, 2003)
- Program Committee Chair
  - 21st International Conference on Formal Engineering Methods, Shenzhen, China, 5-9 Nov 2019.
  - 13th International Symposium on Theoretical Aspects of Software Engineering, Guilin, 29-31 July 2019.
  - 13th International Conference on Formal Engineering Methods, Durham, 25-28 Oct, 2011.
  - 3rd International Symposium on Unifying Theories of Programming, Shanghai, China. 15-16 Nov 2011.
  - 3rd IEEE International Symposium on Theoretical Aspects of Software Engineering, in Tianjin, July 2009.
- Conference Publicity Chair
  - APLAS 2004: Asian Programming Language and Systems Symposium, Taipei, Taiwan, 2004.
  - ICFEM 2003: International Conference on Formal Engineering Methods, Singapore, 2003.
- Program Committee Member of more than 50 international conferences, incl. FM12, IJCAI18-19, AAAI19-20.
- Steering Committee Member
  - the International Conference on Formal Engineering Methods.
  - the IEEE International Symposium on Theoretical Aspects of Software Engineering.
  - the International Symposium on Unifying Theories of Programming.
- Guest Editor: Science of Computer Programming
- Invited Journal Reviewer:
  - Journal of the ACM
  - Science of Computer Programming
  - Journal of Symbolic Computation
  - Formal Aspects of Computing
  - Information Sciences
  - Future Generation Computer Systems
  - IEEE Transaction on Software Engineering
  - Frontiers of Computer Science
  - Journal of Computer Science and Technology

  - IEEE Transactions on Reliability

- Invited Lectures
  - Lecture in Nanyang Technological University, Aug 2018.
  - Lecture in Peking University, Dec 2015.
  - Lecture given in East China Normal University, Oct, 2014
  - Lecture given in Oxford Brookes, June, 2011
  - Lecture given in Institute of Software, Chinese Academy of Science, November 2010
  - Lecture given in York University, UK, July, 2009
  - Lectures given in East China Normal University, October, 2008
  - Lecture given in Peking University, September, 2008
  - Lecture given in National University of Singapore, August, 2005

- Peer review for National Research Funding Councils (UK, Canada, Switzerland, China)
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  - University of Manchester, UK (Richard Banach)
  - University of Southampton, UK (Michael J. Butler)
  - Massachusetts Institute of Technology, USA (Martin Rinard)
  - National University of Singapore, Singapore (Wei-Ngan Chin)
  - Singapore Management University (Jun Sun)
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  - Nanjing University (Xin Chen, Xuandong Li)
  - Shenzhen University (Zhong Ming, Zhiwu Xu)

- Academic Visitors Hosted
  - Prof Zongyan Qiu (from Peking University), Feb-March, 2011
  - Prof Huibiao Zhu (from East China Normal University), Feb-April, 2011
  - Prof Wei-Ngan Chin (from National University of Singapore), June/2014 and May-June/2008

CONTRIBUTION TO COURSE DEVELOPMENT

- *Programme Development*
  - Leading the development of the new (research-led) Advanced MSc in Computer Science in Teesside

- *Course/Module Development*
  - MSc module on Software Verification, Teesside University
  - MSc module on Research Project, Teesside University
  - UG module: Advanced Software Engineering - Formal Verification, Durham University
  - UG module: Programming and Reasoning - Specification and Verification, Durham University

- UG module: Computer Systems II - Introduction to Concurrency, Durham University

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