

Curriculum Vitae

Bow-Yaw Wang

Business Address:

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Experience

Research Fellow at Academia Sinica, since 2012.
Associate Research Fellow at Academia Sinica, 2008-2012.
Adjoint Associate Professor at National Taiwan University, 2009-2012.
Invited Professor at INRIA, 2009-2011.
Assistant Research Fellow at Academia Sinica, 2003-2008.
Invited Associate Professor at Tsinghua University, 2009-2010.
Adjoint Assistant Professor at National Taiwan University, 2004-2009.
Senior Software Engineer at Verplex Systems, 2001-2003.
Summer internship at Intel Corp (with Dr. Ching-Tsun Chou), 1999.
Summer internship at Lucent Technology (with Dr. Gerard Holzmann and Dr. Margaret Smith), 1998.
Summer internship at SRI International (with Dr. José Meseguer), 1997.
Research assistant at Sinica Academia (with Dr. Tyng-Ruey Chuang), 1994.

Research

model checking, formal verification, logic in computer science.

Degrees

Ph.D. in Computer Science, University of Pennsylvania, 1995-2001.
Dissertation: Hierarchical Reduction and Refinement Checking for Asynchronous Processes
Advisor: Dr. Rajeev Alur
M.S. in Electrical Engineering, National Taiwan University, 1992-94
B.S. in Mathematics, National Taiwan University, 1988-92

Professional activities

Program committee

- 9th India Software Engineering Conference (ISEC 2016).
- 13th ASIAN Symposium on Programming Languages and Systems (APLAS 2015).
- 13th International Symposium on Automated Technology for Verification and Analysis (ATVA 2015).
- 30th ACM/IEEE Symposium on Logic in Computer Science (LICS 2015).
- 12th International Symposium on Automated Technology for Verification and Analysis (ATVA 2014).
- 2nd French Singaporean Workshop on Formal Methods and Applications (FSFMA 2014).
- 11th International Symposium on Automated Technology for Verification and Analysis (ATVA 2013).

- 15th International Workshop on Verification of Infinite-State Systems (INFINITY 2013).
- International Workshop on Testing and Verification of Embedded Computing Systems (TVECS 2013).
- 18th International Conference on Engineering of Complex Computer Systems (ICECCS 2013).
- 10th ASIAN Symposium on Programming Languages and Systems (APLAS 2012).
- 2nd International Conference on Certified Programs and Proofs (CPP 2012).
- 16th International Conference on Development of Language Theory (DLT 2012).
- 6th International Joint Conference on Automated Reasoning (IJCAR 2012).
- 9th International Symposium on Automated Technology for Verification and Analysis (ATVA 2011).
- 23rd International Conference on Computer Aided Verification (CAV 2011).
- 2nd International Symposium on Games, Automata, Logics and Formal Verification (GandALF 2011).
- International Workshop on Scalable and Usable Model Checking for Petri Nets and other models of concurrency (SUMo 2010).
- 7th Asian Symposium on Programming Languages and Systems (APLAS 2009).
- 6th International Symposium on Automated Technology for Verification and Analysis (ATVA 2008).
- 5th International Symposium on Automated Technology for Verification and Analysis (ATVA 2007).
- 12th International Conference on Implementation and Application of Automata (CIAA 2007).
- 4th International Symposium on Automated Technology for Verification and Analysis (ATVA 2006).
- 11th International Conference on Implementation and Application of Automata (CIAA 2006).
- 3rd International Symposium on Automated Technology for Verification and Analysis (ATVA 2005).
- 2nd International Symposium on Automated Technology for Verification and Analysis (ATVA 2004).

Visiting

- FORmal Methods for Embedded Systems (FORMES) group at Tsinghua University, Beijing, China. Summer 2009 to Summer 2011.
- Research On Software Analysis for Error-free Computing (ROSAEC) center at Seoul National University, Seoul, South Korea. Summer 2010.
- Research On Software Analysis for Error-free Computing (ROSAEC) center at Seoul National University, Seoul, South Korea. Summer 2009.

Short course

- 2013 Formosan Summer School on Logic, Language, and Computation (FLOLAC 2013). Taipei, Taiwan. August 2013.
- 2007 Formosan Summer School on Logic, Language, and Computation (FLOLAC 2007). Taipei, Taiwan. July 2007.
- 2007 Honduras Summer Courses. Hsin-Chu, Taiwan. July 2007.
- 2006 Honduras Summer Courses. Hsin-Chu, Taiwan. July 2006.

Patent

Kuang-Chien Chen and Bow-Yaw Wang. Integrated Proof Flow System and Method. Cadence Design Systems, Inc. US Patent 7124383. 17 October 2006.

Bow-Yaw Wang. Method and Apparatus for Induction Proof. Cadence Design Systems, Inc. US Patent 7340702. 4 March 2008.

Publications

Papers at Refereed Conferences

- Yu-Fang Chen, Chih-Duo Hong, Nishant Sinha, and Bow-Yaw Wang. *Commutativity of Reducers*. 21st International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2015). Volume 9035 of LNCS, pp 131–146. 2015.
- Yu-Fang Chen, Chiao Hsieh, Ming-Hsien Tsai, Bow-Yaw Wang, and Farn Wang. *CPArec: Verifying Recursive Programs via Source-to-Source Program Transformation*. 21st International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2015). Volume 9035 of LNCS, pp 426–428. 2015.
- Fei He, Xiaowei Gao, Bow-Yaw Wang, and Lijun Zhang. *Leveraging Weighted Automata in Compositional Reasoning about Concurrent Probabilistic Systems*. 42nd Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL 2015). pp 503–514. 2015.
- Yu-Fang Chen, Bow-Yaw Wang, and Kai-Chun Yang. *Learning Summaries of Recursive Functions*. 21st Asia-Pacific Software Engineering Conference (APSEC 2014). 2014.
- Yu-Fang Chen, Chang-Hong Hsu, Hsin-Hung Lin, Peter Schwabe, Ming-Hsien Tsai, Bow-Yaw Wang, Bo-Yin Yang, and Shang-Yi Yang. *Verifying Curve25519 Software*. 21st ACM Conference on Computer and Communications Security (CCS 2014). pp 299–309, 2014.
- Yu-Fang Chen, Chiao Hsieh, Ming-Hsien Tsai, Bow-Yaw Wang, and Farn Wang. *Verifying Recursive Programs Using Intraprocedural Analyzers*. 21st International Symposium on Static Analysis (SAS 2014). Volume 8723 of LNCS, pp 118–133. 2014.
- Fei He, Bow-Yaw Wang, Liangze Yin, and Lei Zhu. *Symbolic Assume-Guarantee Reasoning through BDD Learning*. 36th International Conference on Software Engineering (ICSE 2014). pp 1071–1082. 2014.
- Fei He, Liangze Yin, Bow-Yaw Wang, Lianyi Zhang, Guanyu Mu, Wenrui Meng. *VCS: A Verifier for Component-Based Systems*. Automated Technology for Verification and Analysis (ATVA 2013). Volume 8172 of LNCS, pp 478–481. 2013.
- Yu-Fang Chen and Bow-Yaw Wang. *BULL: A Library for Learning Algorithms of Boolean Functions*. 19th International Conference on Tools and Algorithms for the Construction and Analysis of Systems. Volume 7795 of LNCS, pp 537–542. 2013.
- Wonchan Lee, Yungbum Jung, Bow-Yaw Wang, Kwangkuen Yi. *Predicate Generation for Learning-Based Quantifier-Free Loop Invariant Inference*. Logical Methods in Computer Science 8(3). 2012.
- Yu-Fang Chen and Bow-Yaw Wang. *Learning Boolean Functions Incrementally*. 24th International Conference on Computer Aided Verification. Volume 7358 of LNCS, pp 55–70. 2012.
- Wonchan Lee, Bow-Yaw Wang, and Kwangkeun Yi. *Termination Analysis with Algorithmic Learning*. 24th International Conference on Computer Aided Verification. Volume 7358 of LNCS, pp 88–104. 2012.
- Yungbum Jung, Wonchan Lee, Bow-Yaw Wang, and Kwangkeun Yi. *Predicate Generation for Learning-Based Quantifier-Free Loop Invariant Inference*. 17th International Conference on Tools and Algorithms for the Construction and Analysis of Systems. Volume 6605 of LNCS, pp 205–219. 2011.
- Soonho Kong, Yungbum Jung, Cristina David, Bow-Yaw Wang, and Kwangkeun Yi. *Automatically Inferring Quantified Loop Invariants by Algorithmic Learning from Simple Templates*. 8th Asian Symposium on Programming Languages and Systems. Volume 6461 of LNCS, pp 328–343. 2010.
- Yu-Fang Chen, Edmund M. Clarke, Azadeh Farzan, Fei He, Ming-Hsien Tsai, Yih-Kuen Tsay, Bow-Yaw Wang, and Lei Zhu. *Comparing Learning Algorithms in Automated Assume-Guarantee Reasoning*. 4th International Symposium On Leveraging Applications of Formal Methods, Verification and Validation. Volume 6415 of LNCS, pp 643–657. 2010.
- Yu-Fang Chen, Edmund M. Clarke, Azadeh Farzan, Ming-Hsien Tsai, Yih-Kuen Tsay, and Bow-Yaw Wang. *Automated Assume-Guarantee Reasoning through Implicit Learning*. 22nd International Conference on Computer Aided Verification. Volume 6174 of LNCS, pp 511–528. 2010.
- Min Zhou, Fei He, Bow-Yaw Wang, and Ming Gu. *On Array Theory of Bounded Elements*. 22nd International Conference on Computer Aided Verification. Volume 6174 of LNCS, pp 570–584. 2010.
- Yungbum Jung, Soonho Kong, Bow-Yaw Wang, and Kwangkeun Yi. *Deriving Invariants by Algorithmic Learning, Decision Procedures, and Predicate Abstraction*. 11th International Conference on Verification, Model Checking and Abstract Interpretation. Volume 5944 of LNCS, pp 180–196. 2010.
- Yu-Fang Chen, Azadeh Farzan, Edmund M. Clarke, Yih-Kuen Tsay, and Bow-Yaw Wang. *Learning Minimal Separating DFA's for Compositional Verification*. 15th International Conference on Tools and Algorithms for the Construction and Analysis of Systems. Volume 5505 of LNCS, pp 31–45. 2009.
- Yih-Kuen Tsay and Bow-Yaw Wang. *Automated compositional reasoning of intuitionistically closed regular properties*. 13th International Conference on Implementation and Application of Automata. Volume 5148 of LNCS, pp 36–45. 2008.
- Azadeh Farzan, Yu-Fang Chen, Edmund M. Clarke, Yih-Kuen Tsay, and Bow-Yaw Wang. *Extending automated compositional verification to the full class of omega-regular languages*. 14th International Conference on Tools and Algorithms for the Construction and Analysis of Systems. Volume 4963 of LNCS, pp 2–17. 2008.

- Geng-Dian Huang and Bow-Yaw Wang. *Complete SAT-based Model Checking for Context-Free Processes*. 5th International Symposium on Automated Technology for Verification and Analysis. Volume 4762 of LNCS, pp 51–65. 2007.
- Bow-Yaw Wang. *Automatic Derivation of Compositional Rules in Automated Compositional Reasoning*. 18th International Conference on Concurrency Theory. Volume 4703 of LNCS, pp 303–316. 2007.
- Ming-Hsien Tsai and Bow-Yaw Wang. *Formalization of CTL* in the Calculus of Inductive Constructions*. 11th Annual Asian Computing Science Conference. Volume 4435 of LNCS, pp 317–331. 2006.
- Ming-Hsien Tsai and Bow-Yaw Wang. *Modular Formalization of Reactive Modules in Coq*. 11th Annual Asian Computing Science Conference. Volume 4435 of LNCS, pp 105–119. 2006.
- Bow-Yaw Wang. *On the Satisfiability of Modular Arithmetic Formulae*. 4th Automated Technology for Verification and Analysis. Volume 4218 of LNCS, pp 186–199. 2006.
- Bow-Yaw Wang. *Modeling and Analyzing Applications with Domain-Specific Languages by Reflective Rewriting: a Case Study*. 21st ACM Symposium on Applied Computing. 2006.
- Bow-Yaw Wang. *Automatic Verification of a Model Checker by Reflection*. Eighth International Symposium on Practical Aspects of Declarative Languages. Volume 3819 of LNCS, pp 45–59. 2006.
- Bow-Yaw Wang. *Proving $\forall\mu$ -Calculus Properties with SAT-Based Model Checking*. 25th IFIP WG 6.1 International Conference on Formal Techniques for Networked and Distributed Systems. Volume 3731 of LNCS, pp 113–127. 2005.
- Bow-Yaw Wang. *Specification of an Infinite-State Local Model Checker in Rewriting Logic*. The Seventeenth International Conference on Software Engineering and Knowledge Engineering. pp 442–447. 2005.
- Fang Yu and Bow-Yaw Wang. *Toward Unbounded Model Checking for Region Automata*. 2nd International Symposium on Automated Technology for Verification and Analysis. Volume 3299 of LNCS, pp 20–33. 2004.
- Fang Yu, Bow-Yaw Wang, and Yao-Wen Huang. *Bounded Model Checking for Region Automata*. Joint International Conferences on Formal Modelling and Analysis of Timed Systems and Formal Techniques in Real-Time and Fault-Tolerant Systems. Volume 3253 of LNCS, pp 246–262. 2004.
- Bow-Yaw Wang. *Mu-Calculus Model Checking in Maude*. 5th International Workshop on Rewriting Logic and Its Applications. Volume 117 of ENTCS, pp 135–152. 2004.
- Rajeev Alur and Bow-Yaw Wang. *Verifying Network Protocol Implementations by Symbolic Refinement Checking*. 13th International Conference on Computer Aided Verification. Volume 2102 of LNCS, pp 169–181. 2001.
- Rajeev Alur, Grosu Radu and Bow-Yaw Wang. *Automated Refinement Checking for Asynchronous Processes*. Formal Methods in Computer Aided Design. Volume 1954 of LNCS, pp 55–72. 2000.
- Bow-Yaw Wang, José Meseguer, and Carl A. Gunter. *Specification and formal verification of a PLAN algorithm in Maude*. Proceedings of the 2000 ICDCS workshop on Distributed System Validation and Verification. IEEE Computer Society. April 2000.
- Rajeev Alur and Bow-Yaw Wang. *“Next” Heuristic for On-the-fly Model Checking*. Concurrency Theory, Tenth International Conference. Volume 1664 of LNCS, pp 98–113. 1999.

Papers in Refereed Journals

- Yungbum Jung, Soonho Kong, Cristina David, Bow-Yaw Wang, and Kwangkeun Yi. Automatically inferring loop invariants via algorithmic learning. *Mathematical Structures in Computer Science* 25(4): 892-915 (2015).
- Min Zhou, Fei He, Bow-Yaw Wang, Ming Gu, and Jianguang Sun. Array Theory of Bounded Elements and its Applications. *Journal of Automated Reasoning*, 52(4): 379-405 (2014).
- Min Zhou, Fei He, Bow-Yaw Wang, Ming Gu, Jianguang Sun. A Unified Framework for DPLL(T) + Certificates. *Journal of Applied Mathematics*. doi:10.1155/2013/964682 (2013).
- Wonchan Lee, Yungbum Jung, Bow-Yaw Wang, and Kwangkuen Yi. Predicate Generation for Learning-Based Quantifier-Free Loop Invariant Inference. *Logical Methods in Computer Science*: 8(3) (2012).
- Geng-Dian Huang, Bow-Yaw Wang: Complete SAT-Based Model Checking for Context-Free Processes. *International Journal of Foundations of Computer Science*, 21(2): 115-134 (2010).
- Yih-Kuen Tsay, Bow-Yaw Wang: Automated Compositional Reasoning of Intuitionistically Closed Regular Properties. *International Journal of Foundations of Computer Science*, 20(4): 747-762 (2009).
- Fang Yu and Bow-Yaw Wang. Sat-based Model Checking for Region Automata. *International Journal of Foundations of Computer Science*, 17(4): 775-796 (2006).
- F. Wang, K. Schmidt, F. Yu, G.D. Huang, and B.-Y. Wang. BDD-Based Safety-Analysis of Concurrent Software with Pointer Data Structures Using Graph Automorphism Symmetry Reduction. *IEEE Transactions on Software Engineering*, 30(6): 403–417 (2004).
- Hsu-Chun Yen, Bow-Yaw Wang, and Ming-Sheng Yang. Deciding a Class of Path Formulas for Conflict-Free Petri Nets Theory of Computing Systems, 30(5):475-494 (1997).
- Hsu-Chun Yen, Bow-Yaw Wang, and Ming-Sheng Yang. Some Complexity Results for Rings of Petri Nets. *International Journal of Foundations of Computer Science*. Vol. 5 No. 3&4: 281–292 (1994).

Editorial Work

Jing Liu, Doron Peled, Bow-Yaw Wang, Farn Wang: 4th IEEE International Symposium on Theoretical Aspects of Software Engineering. Taipei, Taiwan. August, 2010. IEEE Computer Society 2010.