

Moonzoo Kim

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Education

- **Ph.D., Computer and Information Science**
University of Pennsylvania, Dec 2001
Dissertation: Information Extraction for Run-time Formal Analysis
Advisors: Sampath Kannan and Insup Lee
- **B.S., Computer Science**
KAIST, Aug 1995

Employment

- Mar 2012-present: Associate professor, CS dept. KAIST
- Sep 2006 - Feb 2012 : Assistant professor, CS dept. KAIST
- May 2004–Aug 2006: Researcher, Pohang University of Science and Technology (POSTECH)
- Jan 2002 –Apr 2004: Research engineer, Samsung SECUi.COM

Research Interests

- Automated Software Testing: automatically generating diverse test cases through program analysis and modification
- Automated Software Debugging: automatically locating buggy statements through both static code analysis and dynamic runtime monitoring
- Concurrent Program Analysis: cost-effective heuristics to explore concurrent behaviors among large space of interleaved executions

Publications¹ :([google scholar profile link](#), Citation: >2000, H-index: 23)

✚ Refereed International Journal Papers

1. S. Hong, T. Kwak, B. Lee, Y. Jeon, B. Ko, Y. Kim, and M. Kim, MUSEUM: Debugging Real-World Multilingual Programs Using Mutation Analysis, Information and Software Technology (IST), , volume 82, pages 80-95, Feb 2017
2. S. Hong, M. Staats, J. Ahn, M. Kim, G. Rothermel, Are Concurrency Coverage Metrics Effective for Testing: A Comprehensive Empirical Investigation, Journal of Software Testing, Verification and Reliability (STVR), volume 25, issue 4, pages 334-370, June 2015
3. S. Hong and M. Kim, A survey of race bug detection techniques for multithreaded programs, Journal of Software Testing, Verification and Reliability (STVR), volume 25, issue 3, pages 191-217, May 2015
4. Z. Xu, Y. Kim, M. Kim, M. Cohen, and G. Rothermel, Directed Test Suite Augmentation: An Empirical Investigation, Journal of Software Testing, Verification and Reliability (STVR), volume 25, issue 2, pages 77-114, March 2015
5. Y.Kim, O.Choi, M.Kim, J.Baik, and T.Kim, Validating Software Reliability Early through Statistical Model Checking, IEEE Software, pages 35-41, May/June 2013
6. S. Hong and M. Kim, Effective Pattern-driven Concurrency Bug Detection for Operating Systems, Journal of Systems and Software (JSS), vol 86, issue 2, pages 377–388, Feb 2013

¹My papers that were written before 2003 used MoonJoo Kim as an author name instead of MoonZoo Kim

7. M.Kim, Y.Kim and Y.Choi, Concolic Testing of the Multi-sector Read Operation for Flash Storage Platform Software, *Formal Aspects of Computing (FACJ)*, vol 24, no 2, May 2012
8. Y.Choi and M.Kim, Controlled Composition and Abstraction for Bottom-up Integration and Verification of Abstract Components, *Information and Software Technology (IST)*, vol 54, issue 1, page 119-136, Jan 2012
9. M.Kim, Y.Kim, and H.Kim, A Comparative Study of Software Model Checkers as Unit Testing Tools: An Industrial Case Study, *IEEE Transactions on Software Engineering (TSE)*, vol 37, no 2, pages 146-160, March 2011
10. J.Esposito and M.Kim, Using Formal Modeling with an Automated Analysis Tool to Design and Parametrically Analyze a Multi-robot Coordination Protocol: a case study, *IEEE Transactions on Systems, Man, and Cybernetics (SMC) Part A*, vol 37, no.3, pages 285-297, May 2007
11. M.Kim, S. Kannan, I.Lee, O. Sokolsky, and M. Viswanathan, Java-MaC: A Run-Time Assurance Approach for Java Programs, *Formal Methods in System Design (FMSD)*, vol 24, no 2, pages 129-155, Mar 2004
12. K.Bhargavan, C.A.Gunter, M.Kim, I.Lee, D.Obradovic, O.Sokolsky, and M.Viswanathan, Verisim: Formal Analysis of Network Simulations, *IEEE Transactions on Software Engineering (TSE)*, vol 28, no 2, pages 129-145, Feb 2002

✚ Refereed International Conference Papers

1. Y. Kim, Y. Choi, and M. Kim, Precise Concolic Unit Testing of C Programs with Extended Units and Symbolic Alarm Filtering, *Intl. Conf. on Software Engineering (ICSE)*, 2018 (**acceptance rate:21%**)
2. Y. Kim, S. Hong, B. Ko, L. Phan and M. Kim, Invasive Software Testing: Mutating Target Programs to Diversify Test Exploration for High Test Coverage, *IEEE International Conference on Software Testing, Verification and Validation (ICST)*, 2018, **Distinguished paper award**, (**acceptance rate:25%**)
3. L. Phan, Y. Kim, M.Kim, MUSIC: Mutation Analysis Tool with High Configurability and Extensibility, *Mutation Workshop*, 2018
4. S. Hong, B. Lee, T. Kwak, Y. Jeon, B. Ko, Y. Kim, and M. Kim, Mutation-based Fault Localization for Real-world Multilingual Programs, *IEEE/ACM International Conference on Automated Software Engineering (ASE)*, Pages: 464 – 475, Nov 9-13, 2015 (**acceptance rate: 19%**)
5. Y. Park, S. Hong, M. Kim, D. Lee, and J. Cho, Systematic Testing of Reactive Software with Non-deterministic Events: A Case Study on LG Electric Oven, *Intl. Conf. on Software Engineering (ICSE) Software Engineering In Practice (SEIP) track*, Pages: 29 – 38, May 2015 (**acceptance rate of SEIP track: 23%**)
6. Y. Kim and M. Kim, SAT-based Bounded Software Model Checking for Embedded Software: A Case Study, *Asia-Pacific Software Engineering Conference (APSEC)*, Pages: 55 - 62, Dec 1-4 2014
7. S.Moon, Y.Kim, M.Kim, S.Yoo, Ask the Mutants: Mutating Faulty Programs for Fault Localization, *IEEE International Conference on Software Testing, Verification and Validation (ICST)*, Pages: 153 - 162, March 31-April 4, 2014 (**acceptance rate: 28%**)
8. S. Hong, Y. Park, M. Kim, Detecting Concurrency Errors in Client-side JavaScript Web Applications, *IEEE International Conference on Software Testing, Verification and Validation (ICST)*, Pages: 61 - 70, March 31-April 4, 2014 (**acceptance rate: 28%**)
9. Y.Kim, Z.Xu, M.Kim, M.Cohen, and G.Rothermel, Hybrid Directed Test Suite Augmentation: An Interleaving Framework, *IEEE International Conference on Software Testing, Verification and Validation (ICST)*, Pages: 263-272, March 31-April 4, 2014 (**acceptance rate: 28%**)
10. Y.Kim, Y.Kim, T.Kim, G.Lee, Y.Jang, and M.Kim, Automated Unit Testing of Large Industrial Embedded Software using Concolic Testing, *IEEE/ACM Automated Software Engineering (ASE) Experience track*, Pages: 519 – 528, Nov 11-15, 2013
11. S. Hong, M. Staats, J. Ahn, M. Kim, G. Rothermel, The Impact of Concurrent Coverage Metrics on Testing Effectiveness, *IEEE International Conference on Software Testing, Verification and Validation (ICST)*, Pages: 232 - 241, Mar 18-22, 2013 (**acceptance rate: 25%**)
12. Y.J.Kim and M. Kim, Hybrid Statistical Model Checking Technique for Reliable Safety Critical Systems, *IEEE Intl. Symp. on Software Reliability Engineering (ISSRE)*, Pages: 51 - 60, Dallas, TX USA, Nov 27-30, 2012
13. Y.J.Kim, M.Kim, and T.Kim, Statistical Model Checking for Safety Critical Hybrid Systems: An Empirical Evaluation, *Haifa Verification Conference (HVC)*, Pages 162-177, Haifa, Israel, Nov 6-8, 2012
14. M. Staats, S. Hong, M. Kim, and G. Rothermel, Understanding User Understanding: Determining Correctness of Generated Program Invariants, *Intl. Symp. on Software Testing and Analysis (ISSTA)*, Pages 188-198, July 15-20, 2012
15. S. Hong, J. Ahn, S. Park, M. Kim, and M. J. Harrold, Testing Concurrent Programs to Achieve High Synchronization Coverage, *Intl. Symp. on Software Testing and Analysis (ISSTA)*, Pages 210-220, July 15-20, 2012
16. Y.Kim, M.Kim, Y.Kim, and Y.Jang, Industrial Application of Concolic Testing Approach: A Case Study on libexif by Using CREST-BV and KLEE, *Intl. Conf. on Software Engineering (ICSE), Software Engineering in Practice (SEIP) track*, Pages: 1143 – 1152, June 2-9, 2012 (**acceptance rate of SEIP track: 19%**)

17. M.Kim, Y.Kim and G.Rothermel, A Scalable Distributed Concolic Testing Approach: An Empirical Evaluation, IEEE International Conference on Software Testing, Verification and Validation (ICST), Pages: 340 - 349, April 17-21, 2012 (**acceptance rate: 27%**)
18. M.Kim, Y.Kim and Y.Jang, Industrial Application of Concolic Testing on Embedded Software: Case Studies, IEEE International Conference on Software Testing, Verification and Validation (ICST) Industrial track, Pages: 390 - 399, April 17-21, 2012, **nominated as a best paper (acceptance rate of Industry track: 23%)**
19. Z.Xu, Y.Kim, M.Kim and G.Rothermel, A Hybrid Directed Test Suite Augmentation Technique, IEEE Intl. Symposium on Software Reliability Engineering (ISSRE), Pages: 150 - 159, Hiroshima, Japan, Nov 29-Dec 2 2011 (**acceptance rate: 25%**)
20. M.Kim and Y.Kim, Automated Analysis of Industrial Embedded Software, Automated Technology for Verification and Analysis (ATVA), Pages:51-59, Taipei, Taiwan, Oct 11-14 2011 (**invited paper**)
21. Y.Kim and M.Kim, SCORE: a Scalable Concolic Testing Tool for Reliable Embedded Software, ACM SIGSOFT Foundation of Software Engineering (FSE) Tool demonstration track, pages 420-423, Szeged, Hungary, Sep 5-9 2011
22. Y.Kim, M.Kim and Y.Jang, Concolic Testing on Embedded Software - Case Studies on Mobile Platform Programs, ACM SIGSOFT Foundation of Software Engineering (FSE) Industrial track, Szeged, Hungary, Sep 5-9 2011
23. Z.Xu, Y.Kim, M.Kim, G.Rothermel, and M.Cohen, Directed Test Suite Augmentation: Techniques and Tradeoffs, ACM SIGSOFT Foundation of Software Engineering (FSE), pages 257-266, Santa Fe, New Mexico, USA, Nov 7-11 2010 (**acceptance rate: 20%**)
24. Y.Kim, M.Kim, N.Dang, Scalable Distributed Concolic Testing: a Case Study on a Flash Storage Platform, Grand Challenge in Verified Software Track @ Intl. Conf. on Theoretical Aspects of Computing (ICTAC), pages 199-213, Natal, Brazil, Sep 1-3 2010
25. M.Kim and Y.Kim, Concolic Testing of the Multi-sector Read Operation for Flash Memory File System, Grand Challenge in Verified Software Track @ Brazilian Symposium on Formal Methods (SBMF), pages 251-265, Gramado, Brazil, Aug 19-21 2009 (LNCS 5902)
26. M.Kim, S.Hong, C.Hong and T.Kim, Model-based Kernel Testing for Concurrency Bugs through Counter Example Replay, Model-based Testing (ENTCS vol 253, issue 2), pages 21-36, York, UK, Mar 22 2009
27. M.Kim, Y.Kim and H.Kim, Unit Testing of Flash Memory Device Driver through a SAT-based Model Checker, IEEE/ACM Automated Software Engineering (ASE), pages 198-207, L'Aquila, Italy, Sep 15-19 2008 (**acceptance rate: 12%**)
28. M.Kim, Y.Choi, Y.Kim and H. Kim, Formal Verification of a Flash Memory Device Driver - an Experience Report, Spin Workshop (LNCS 5156), pages 144-159, LA, USA, August 10-12 2008
29. M.Kim, Y.Kim, Y.Choi, and H.Kim, Pre-testing Flash Device Driver through Model Checking Techniques, IEEE Intl. Conf. on Software Testing, Verification and Validation (ICST), pages 475-484, Lillehammer, Norway, April 9-11 2008 (**acceptance rate: 20%**)
30. M.Kim, Formal Modeling and Verification of High-Availability Protocol for Network Security Appliances, Automated Technology for Verification and Analysis (ATVA) (LNCS 4762), pages 489-500, Tokyo, Japan, Oct 22-25 2007 (short paper)
31. K.C.Kang, J.Lee, B.Kim, M.Kim, C.Seo, and S.Yu, Re-engineering a Credit Card Authorization System for Maintainability and Re-usability of Components: a Case Study, Intl. Conf. on Software Reuse (ICSR)(LNCS 4039), pages 156-169, Turin, Italy, June 12-15 2006
32. M.Kim and K.C.Kang, Formal Construction and Verification of Home Service Robots: A Case Study, Automated Technology for Verification and Analysis (ATVA) (LNCS 3707), pages 429-443, Taiwan, Taipei, Oct 4-7 2005
33. K.C.Kang, M.Kim, J.Lee, and B.Kim, Feature-oriented Re-engineering of Legacy Systems into Product Line Assets: A Case Study, Software Product Line Conference (SPLC) (LNCS 3714), pages 45-56, Rennes, France, Sep 26-29 2005
34. M.Kim, J.Lee, K.C.Kang, Y.Hong, and S.Bang, Re-engineering Software Architecture of Home Service Robots: A Case Study, Intl. Conf. on Software Engineering (ICSE) Experience track, pages 505-513, St. Louis Missouri, USA, May 15-21 2005 (**acceptance rate of Experience track: 19%**)
35. K.C.Kang, M.Kim, J.Lee, B.Kim, Y.Hong, H.Lee, and S.Bang, 3D Virtual Prototyping of Home Service Robots Using ASADAL/OBJ, IEEE Intl. Conf. on Robotics and Automation (ICRA), pages 2903-2908, Barcelona, Spain, April 18-22 2005
36. M.Kim, K.C.Kang, and H.Lee, Formal Verification of Robot Movements-a Case Study on Home Service Robot SHR100, IEEE Intl. Conf. on Robotics and Automation (ICRA), pages 4739-4744, Barcelona, Spain, April 18-22 2005
37. M.Viswanathan and M.Kim, Foundations for the Run-time Monitoring of Reactive Systems: Fundamentals of the MaC Language, Intl. Conf. on Theoretical Aspects of Computing (ICTAC) (LNCS 3407), pages 543-556, Guiyang, China Sep 20-24 2004

38. M.Kim, S.Kannan, I.Lee, O.Sokolsky, and M.Viswanathan, Computational Analysis of Run-time Monitoring – Fundamentals of Java-MaC, Runtime Verification (RV) (ENTCS vol 70 no 4), pages 80-94, Copenhagen Denmark, July 26 2002
39. M.Kim, I.Lee, U.Sammapun, J.Shin, and O.Sokolsky, Monitoring, Checking, and Steering of Real-time Systems, Runtime Verification (RV) (ENTCS vol 70 no 4), pages 95-111, Copenhagen Denmark, July 26 2002
40. M.Kim, S.Kannan, I.Lee, O.Sokolsky, and M.Viswanathan, Java-MaC: a Run-time Assurance Tool for Java Programs, Runtime Verification (RV) (ENTCS vol 55 no 2), pages 218-235, Paris France, July 23 2001
41. K.Bhargavan, C.A.Gunter, M.Kim, I.Lee, D.Obradovic, O.Sokolsky, and M.Viswanathan, Verisim: Formal Analysis of Network Simulations, ACM Intl. Symposium on Software Testing and Analysis (ISSTA), pages 2-13, Portland, Oregon, USA, August 22-24 2000 (**acceptance rate:23%**)
42. S.Kannan, M.Kim, I.Lee, O.Sokolsky, and M.Viswanathan, Run-time monitoring and steering based on formal specifications, Modeling Software System Structures in a Fastly Moving Scenario, Santa Margherita Ligure, Italy, June 13-16 2000 (**invited paper**)
43. R.Alur, J.Esposito, M.Kim, V.Kumar and I.Lee, Formal Modeling and Analysis of Hybrid Systems: A Case Study in Multirobot Coordination, World Congress On Formal Methods (FM) (LNCS 1708), pages 212-232, Toulouse, France, Sep 20-24 1999
44. I.Lee, S.Kannan, M.Kim, O.Sokolsky, M.Viswanathan, Runtime Assurance Based On Formal Specifications, Parallel and Distributed Processing Techniques and Applications (PDPTA), pages 279-287, Monte Carlo Resort, Las Vegas, Nevada, USA, June 28 - July 1, 1999
45. M.Kim, M.Viswanathan, H.B.Abdallah, S.Kannan, I.Lee and O.Sokolsky, Formally Specified Monitoring of Temporal Properties, European Conf. on Real-Time Systems (ECRTS), pages 114-122, York, UK, June 9-11, 1999
46. O.Sokolsky, S.Kannan, M.Kim, I.Lee and M.Viswanathan, Steering of Real-Time Systems based on Monitoring and Checking, Fourth International Workshop on Object-Oriented Real-time Dependable Systems, pages 11-18, Santa Barbara, California, USA, Jan 27-29, 1999
47. I.Lee, H.Ben-Abdallah, S.Kannan, M.Kim, O.Sokolsky, M.Viswanathan, A monitoring and checking framework for run-time correctness assurance, Korea-U.S. Technical Conference on Strategic Technologies, Vienna, VA, October 1998.



Books

1. Proceeding of 6th Intl. Symposium. of Automated Technology for Verification and Analysis (ATVA) (LNCS 5311, ISBN 978-3-540-88386-9), S.Cha, J.Y.Choi, M.Kim, I.Lee, M.Viswanathan (Eds.), Springer, 2008



Refereed Domestic Journal Papers (written in Korean)

1. 김윤호, 김문주, 안드로이드 커널 모듈 취약점 탐지를 위한 자동화된 유닛 테스트 생성 기법, Journal of KIISE: Software and Applications, Vol. 44, Num. 2, Feb 2017
2. 전이루, 김윤호, 홍신, 김문주, Mutagen4J: 효과적인 Java 프로그램 변이 생성 도구, Journal of KIISE: Software and Applications, Vol. 43, Num. 9, Sep 2016
3. Y.Kim, T.Kim, M.Kim, H.Lee, H.Jang, and M.Park, Effective Integer Promotion Bug Detection Technique for Embedded Software, Journal of KIISE: Software and Applications, Vol. 43, Num 6, Jun 2016
4. Y.Moon, M.Kim, and T.Kim, Development of Architecture Description Language for Embedded Systems, Journal of KIISE: Software and Applications, Vol. 41, Num. 4, Apr 2014
5. Y.Park, S.Hong, M.Kim, Performance Bug Detection in Web Applications through Cross-browser Profiling, Journal of KIISE: Computing Practices and Letters, Vol. 19, Num. 11, Nov. 2013
6. S.Moon, Y.Kim, M.Kim, FEAST: An Enhanced Fault Localization Technique using Probability of Test Cases Executing Faults, Journal of KIISE: Software and Applications, Vol 40, Num 10, Oct 2013
7. Y.Kim, Y.Park, M.Kim, A Comparative Case Study on Static Program Analysis Tools, Journal of KIISE: Computing Practices and Letters, Vol 19, Num 8, Aug 2013
8. Y.Kim, M.Kim, Y.Jang, CREST-BV: CREST-BV: An Improved Concolic Testing Technique Supporting Bitwise Operations for Embedded Software, Journal of KIISE: Software and Applications, To be published
9. Y.Kim, M.Kim, Y.Kim, and E.Jung, Comparative Study of KLEE Concolic Testing Tool, Journal of KIISE: Computing Practices and Letters, Vol 18, Num 4, Apr 2012
10. M.Kim and S.Hong, Model-based Kernel Testing (MOKERT) Framework, Journal of KIISE: Software and Applications, vol 36, no 7, July 2009



Refereed Domestic Conference Papers (written in Korean)

1. 김현우, 김윤호, 김문주, Concolic 테스트 도구 CREST 의 사용자 친화성 향상 연구: Windows OS 로의 포팅과 개선된 CREST UI 을 통한 CREST 활용 및 분기 커버리지 분석 작업의 효율 증가, Korea Conference on Software Engineering (KCSE), Jan 29-31, 2018 (**Best paper award**)
2. 임현수, 김윤호, 김문주, 시스템 테스트 케이스를 이용한 C 프로그램의 동적 유닛 입력 값 자동 수집 및 재연 기술, Korea Software Congress (KSC), Dec 20-22, 2017 (**Distinguished best paper award**)

3. Phan Duy Loc, 고봉석, 김윤희, 김문주, COMUT: 사용자의 의도대로 효과적인 변이를 생성할 수 있는 C 프로그램 변이 도구, Korea Software Congress (KSC), Dec 20-22, 2017 (**Best paper award**)
4. 김윤희, 김현우, 양용규, 김문주, 효과적인 변이 분석을 위한 C 프로그램 변이 도구 비교: Proteum 과 Milu 를 사용한 사례 연구, Korea Computer Congress (KCC), Dec 21-23, 2016 (**Best paper award**) Y.Kim and M.Kim, Automated Unit-test Generation for Detecting Vulnerabilities of Android Kernel Modules, Korea Computer Congress (KCC), Jun 29-Jul 1, 2016
5. Y.Kim and M.Kim, Efficient Search Strategy of Dynamic Symbolic Execution Using Input Coverage, Korea Conference on Software Engineering (KCSE), 2016 (short paper) (**Best short paper award**)
6. T.Kim, M.Kim, H.Lee, H.Jang, and M.Park, Detecting Integer Promotion Bugs with Embedded Software using Static Analysis Technique, Korea Computer Congress (KCC), Dec 17-19, 2015 (**Best paper award**)
7. Y.Park, S.Hong, M.Kim, J.Cho, D.Lee, and H.Jang, Automated Testing Technique for Event-driven Embedded Software: Case Study on LG Micro-oven Software, Korea Conference on Software Engineering (KCSE), Jan 28-30, 2015 (short paper) (**Best short paper award**)
8. S.Moon, M.Kim, Automated Precise Fault-Localization Utilizing Testing Results on Program Mutant, Korea Conference on Software Engineering (KCSE), Feb 12-14, 2014 (4 pages short paper) (**Distinguished best paper award**)
9. Y.Park, Y.Kim, J.Cho, M.Kim, Effective Concolic Testing with Symbolic Library, Korea Conference on Software Engineering (KCSE), Feb 12-14, 2014 (4 pages short paper) (**Best paper award**)
10. Y.Moon, M.Kim, T.Kim, Development of Architecture Description Language for Embedded Systems, Korea Computer Congress (KCC), Nov 15-16, 2013
11. J.Ahn, M.Kim, Survey of Faults of Web Applications in Javascript, Korea Conference on Software Engineering (KCSE), Jan 30 - Feb 1, 2013
12. S.Moon, Y.Kim, M.Kim, Precise Fault Localization with Fault-weights on Test Cases, Korea Conference on Software Engineering (KCSE), Jan 30 - Feb 1, 2013 (short paper)
13. Y.Park, Y.Kim, M.Kim, Comparative Study of Static Analysis Tools: a Case Study on libexif using Coverity and Sparrow, Korea Computer Congress (KCC), Nov 23-24, 2012 (**Best presentation award**)
14. Y.Kim, M.Kim, Y.Jang, CREST-BV: Concolic Testing Technique for Supporting Bitwise Operations of Embedded Software, Korea Computer Congress (KCC), June 27-29, 2012 (**Best paper award**)
15. S.Hong, M.Kim, and Matt Staats, Validating Inferred Invariants using Symbolic Execution, Korea Conference on Software Engineering (KCSE), Feb 8-10, 2012 (4 pages short paper)
16. D.Hoang, Y.Kim and M.Kim, A Case Study of the Application of Dynamic Symbolic Execution to Real-World Binary Programs, Korea Conference on Software Engineering (KCSE), Feb 8-10, 2012 (4 pages short paper)
17. J.Ahn, S.Hong, and M.Kim, Study on Structural Coverage for Concurrent Programs, Korea Conference on Software Engineering (KCSE), Feb 8-10, 2012 (4 pages short paper)
18. Y.Kim, Y.Kim, and M.Kim, A Case Study of KLEE Concolic Testing Tool, Korea Computer Congress (KCC), Nov 25-26, 2011 (**Best paper award**)
19. Y.Kim and M.Kim, Dynamic Symbolic Execution and Genetic Algorithm for Test Case Generation, Korea Conf. on Software Engineering (KCSE), Feb 9-11, 2011
20. Y.Kim and M.Kim, Comparative Study on Concolic Testing Tools, Korea Conf. on Software Engineering (KCSE), Feb 8-10, 2010
21. M.Kim, C.Hong and S.Hong, Model-based Kernel Testing through Counter Example Replay, Korea Conf. on Software Engineering (KCSE), Feb 9-11, 2009 (**Best paper award**)
22. M.Kim, Y.Kim and H.Kim, Formal Verification of the Flash Memory Device Driver through Model Checker, Korea Conf. on Software Engineering (KCSE), Feb 20-22, 2008

Patents

Domestic Patents:

1. Automated Testing Method and Apparatus for Program Processable Non-Deterministic Events (10-2015-0107689), patent applied on July 30, 2015
2. Device and Method For Statistical Model Checking Using Hybrid Technique (10-2013-0144946), patent registration on May 6, 2015
3. Auto-test Generation Device, Method and Recording Medium using Test Coverage Information for Multi-thread Program (10-2013-0082302), patent registration on May 6, 2015
4. Method of Distributed Scalable Concolic Testing for Software Reliability (10-1227024), patent registration on Jan 22, 2013

Invited Talks

International Invited Talks

1. Ask the Mutants: Mutating Faulty Programs for Fault Localization, HKUST, Hong Kong, Nov 5, 2013
2. Automated Testing of Industrial Embedded Software (Computer Science and Engineering Department Seminar), HKUST, Hong Kong, Nov 4, 2013
3. Automated Testing of Industrial Embedded Software, National Institute of Informatics (NII), Japan, Aug 14, 2013
4. Automated Testing of Industrial Embedded Software, JAIST, Japan, Aug 12, 2013
5. Automated Analysis of Industrial Embedded Software, Microsoft Research Asia (MSRA), China, June 18, 2013
6. Real-world Application of Concolic Testing Approach, National University of Singapore (NUS), Singapore, Jan 10, 2012
7. Automated Analysis of Industrial Embedded Software, National University of Singapore (NUS), Singapore, Jan 9, 2012
8. Automated Analysis of Industrial Embedded Software, the 9th intl. symposium on Automated Technology for Verification and Analysis (ATVA), Taipei, Taiwan, Oct 14, 2011
9. Comparative Study on Software Model Checkers as Unit Testing Tools: An Industrial Case Study, Kyushu Univ. Japan, Jan 25, 2010
10. Formal Verification of a Flash Memory Device Driver, Academia Sinica, Taiwan, Jan 17, 2008
11. Strategic Application of Off-the-Shelf Formal Verification Tools to the Device Driver of OneNAND Flash Memory, Specification and Verification Center, Carnegie Mellon University, Aug 22, 2007
12. Formal Verification of Flash Memory Software, NEC laboratories Princeton US, Aug 20, 2007
13. Formal Specification & Verification of USP Flash Translation Layer, Univ. of Pennsylvania, July 20, 2007
14. Formal Construction and Verification of Home Service Robots: A Case Study, Research Center for Verification and Semantics, AIST Japan, Feb 1, 2006

Domestic Invited Talks

1. Automated White-Box Software Testing, ITRC SSRC Seminar, April 29, 2016
2. Automated Testing of Industrial Embedded Software, Chassis Control Dept. of Hyundai Motor Group, Nov 18, 2015
3. Automated Testing of Industrial Embedded Software, Suresoft, Sep 1, 2015
4. Automated Testing of Industrial Embedded Software, Integrated Safety Control Dept. of Hyundai Motor Group, June 15, 2015
5. Application of Symbolic Execution: Systematic Testing of Reactive Software with Non-deterministic Events, KAIST Graduate School of Information Security Workshop, June 5, 2015
6. Vision for Automated Software Testing in Korea IT Industry, IITP ITRC Forum, May 28, 2015
7. Automated Testing of Industrial Embedded Software, Hyundai Motor Group Chassis Safety Forum, Jan 30, 2015
8. False Alarm Reduction Technique for Automated Concolic Unit testing, ERC ROSAEC Winter Workshop, Jan 28, 2015
9. Clang and LLVM API for Source Code Refactoring, Samsung Electronics, Nov 12, 2014
10. Software Model Checking, Test Midas, Oct 16, 2014
11. Ask the Mutants: Mutating Faulty Programs for Fault Localization, Test Midas, Sep 25, 2014
12. Automated Testing of Industrial Embedded Software using Concolic Testing, GIST, Sep 5, 2014
13. Automated Testing of Industrial Embedded Software using Concolic Testing, Test Midas, Sep 4, 2014
14. Code Coverage-based Testing of Concurrent Programs, Samsung Electronics, July 3, 2014
15. Automated Testing of Industrial Embedded Software using Concolic Testing, Ajou University, June 17, 2014
16. Automated Testing of Industrial Embedded Software using Concolic Testing, LG Electronics, May 23, 2014
17. Automated Unit Testing of Large Industrial Embedded Software using Concolic Testing, Kyungpook National University, Dec 20, 2013
18. Automated Testing of Industrial Embedded Software, LG Electronics, Oct 1, 2013
19. Automated Testing of Industrial Embedded Software, Coverity Workshop keynote seminar, Sep 13, 2013
20. Industrial Application of Concolic Testing to Detect Crash Bugs- A Case Study on libexif, Korea Univ., July 3, 2013
21. Automated Testing of Industrial Embedded Software, Samsung Electronics, July 9, 2013
22. Testing Concurrent Programs to Achieve High Synchronization Coverage, Samsung Electronics, Oct 25, 2012
23. Real-world Application of Concolic Testing Approach, LG Electronics, Sep 6, 2012
24. Automated Testing of Industrial SW: Concolic Testing Approach, LG Electronics, July 25, 2012
25. Real-world Application of Concolic Testing Approach: Part II“, Suresoft, May 21, 2012
26. Real-world Application of Concolic Testing Approach: Part I“, Suresoft, May 17, 2012
27. Automated Software Testing Techniques, NIPA Software Quality Insight Seminar, July 5, 2011
28. Automated Software Testing Techniques for High Reliability, NIPA Software Quality Insight Seminar, Jan 27, 2011
29. Automated Software Analysis Techniques for High Reliability, Korea Univ. Nov 4, 2010
30. Automated Test Case Generation through Concolic Testing Techniques, Samsung Electronics, Feb 17, 2010

31. Systematic Unit Analysis Techniques for Embedded C Programs, Fasoo.com, Dec 15, 2009
32. Automated Software Analysis Techniques : Past, Present, and Future, Samsung Tech Fair, Samsung Advanced Institute of Technology (SAIT), Nov 19, 2009
33. Systematic Unit Analysis Techniques for Embedded C Programs, Samsung Electronics, Oct 16, 2009
34. Unit Testing of Flash Memory Device Driver through a SAT-based Model Checker, Chonbuk Natl. Univ., Oct 13, 2009
35. Formal Verification Techniques for Embedded Software, Samsung Electronics, Mar 18, 2009
36. Industrial Case Studies based on Software Model Checking, ETRI, July 2, 2008
37. Formal Specification & Verification of USP Flash Translation Layer, Seoul National Univ., Apr 19, 2008
38. SAT-based analysis for C Programs, KIISE SIGPL Winter School, KAIST, Feb 1st, 2008
39. MacDebugger: A Monitoring and Checking (MaC) based Debugger for Model Checkers, KIISE SE Society Tutorial, Sogang Univ, May 31, 2007
40. Formal Specification and Verification of USP Flash Translation Layer, Samsung Electronics, Mar 20, 2007
41. Formal Debugging through Model Checking and Runtime Verification, Korea Univ., Mar 14, 2007
42. Model Checking of Flash Device Driver, Kyungpook National Univ., Mar 7, 2007
43. Programming Language in Software Engineering, KIISE SIGPL Winter School, Feb 9, 2007
44. MacDebugger: A Monitoring and Checking (MaC) based Debugger for Formal Models, KAIST, Sep 25, 2006

Research Funding (total amount: KRW 3,086,555,000)

✚ Funding from Korean Government Agencies (total amount: KRW 1,854,055,000)

1. Automated SW testing and debugging techniques for improving SW quality, June 2016-May 2018, **Mid-career Research Program (MRP) supported by National Research Foundation of Korea (NRF)**, (KRW 297,000,000)
2. Behavioral Coverage for Effective Software Testing, Dec 2014-Dec 2016, National Research Foundation of Korea (NRF) (KRW 80,000,000)
3. Tools for Highly Secure Software Development (Part III. Advanced Testing Techniques for Secure Software), ITRC supported by National IT Industry Promotion Agency (ITRC, NIPA), Sep 2013-Dec 2016 (KRW 155,140,000)
4. Development of Mobile S/W Security Testing Tools for Detecting New Vulnerabilities of Android, Korea Communications Commission, Apr 2013-Mar 2016, (KRW 200,000,000)
5. Innovative Software Analysis Technology Research & Development (Part III-2 of ERC Research On Software Analysis for Error-free Computing (ROSAEC)), Sep 2008 – Feb 2015, ERC supported by Korea Ministry of Education, Science and Technology (MEST)/ National Research Foundation of Korea(NRF) (KRW 245,750,000)
6. Testing Technique for Detecting Concurrency Bugs of Multi-threaded Programs, Sep 2012-Aug 2015, **Mid-career Research Program (MRP) supported by National Research Foundation of Korea (NRF)** (KRW 293,000,000)
7. Performance Bug Detection Framework for JavaScript Programs, Aug 2012-June 2013, Microsoft Korea (KRW 60,000,000)
8. Highly Reliable Micro Dual Operating System, June 2012-Feb 2017, Electronics and Telecommunications Research Institute (ETRI) (KRW 200,000,000)
9. Dynamic Analysis of Embedded Software, Dec 2011-Dec 2013, FormalWorks Inc. (KRW 100,000,000)
10. Application of Dynamic Symbolic Execution for Binary Programs, April 2011-Oct 2011, National Security Research Institute (NSRI) (KRW 35,000,000)
11. Improved Automated Test Case Generation through Parallelized Concolic Testing Technique, May 2010-April 2011, National Research Foundation (NRF) (KRW 49,996,000)
12. Concurrency Bug Detection through Improved Pattern Matching Using Semantic Information, May 2009-April 2010, National Research Foundation (NRF) (KRW 48,369,000)
13. Advanced Technology for Software Process Improvement (Part of ITRC Software Process Improvement Center), Jan 2009-Dec 2010, IITA (KRW 33,400,000)
14. SAT Solver Based Verification of Embedded Software for Improved Reliability, July 2008-June 2009, Korea Research Foundation (KRF) (KRW 26,400,000),
15. Target Architecture Independent Development Technique, July 2008-Jan 2009, Electronics and Telecommunications Research Institute (ETRI) (KRW 30,000,000)

✚ Funding from Industry (total amount: KRW 1,052,500,000)

1. Software Coverage to Improve Software Quality, May 2015-Nov 2016, Hyundai Motor Group (KRW 59,500,000)
2. Automated Testing Framework for C Programs, July 2015-June 2020, Samsung Electronics (KRW 300,000,000)
3. Application of Concolic Testing to the Software of Hyundai Motors, May 2015-Nov 2016, Hyundai Motor Group (KRW 51,000,000)
4. Integer Promotion Bug Detection For Micro-Controller Software of Home Appliances, Mar-Sep 2015, LG Electronics (KRW 60,000,000)
5. Testing and Replaying Framework for Multi-threaded Programs, June-Dec 2014, Samsung Electronics (KRW 50,000,000)

6. Effective and Efficient Embedded Software Testing by Using Concolic Testing Technique, Apr-Aug 2014, LG Electronics (KRW 50,000,000)
7. Improved Testing Accuracy and Bug Detection Capability for Concolic Testing Technique, Mar-Dec 2014, Samsung Electronics (KRW 97,000,000)
8. Unit Testing Strategies for Effective Concolic Testing, Feb 2013-Nov 2013, Samsung Electronics (KRW 97,000,000)
9. Advanced Concolic Testing Framework, Mar 2012-Dec 2012, Samsung Electronics (KRW 90,000,000),
10. Automated Test Case Generation Through Concolic Testing, Mar 2011-Oct 2011, Samsung Electronics (KRW 70,000,000)
11. Automated Test Case Generation Through Concolic Testing, June 2010-Dec 2010, Samsung Electronics (KRW 60,000,000)
12. Formal Verification of a Flash File System, Nov 2007-Aug 2008, Samsung Electronics (KRW 49,000,000)
13. Applicable Formal Verification Techniques on Embedded Systems, Sep 2006-April 2009, LG Electronics (KRW 19,000,000)

✚ Funding from KAIST (total amount: KRW 180,000,000)

1. Software Verification Techniques for Improved Productivity of Embedded Software, Jan 2008-Dec 2008, KAIST IT Institute (KRW 30,000,000)
2. Formal Analysis of Embedded Software for High Reliability, Sep 2006-Dec 2008, KAIST (KRW 150,000,000)

Company Consulting and Training (total amount: KRW 195,700,000)

1. Automated Unit Testing Techniques, Sep 2015-Dec 2015, LG Electronics (KRW 29,900,000)
2. Automated Embedded Software Testing Through Concolic Testing, Jan 2013-Dec 2013, LG Electronics (KRW 80,000,000)
3. Automated Embedded Software Testing Techniques, Oct 2012-Dec 2012, LG Electronics (KRW 28,600,000)
4. Formal Verification of Operation Systems, Aug 2011-Nov 2011, Samsung Advanced Institute of Technology (SAIT) (KRW 27,200,000)
5. Application of Concolic Testing to Flash Translation Layer, Sep 2009-Dec 2009, Samsung Advanced Institute of Technology (SAIT) (KRW 30,000,000)

Industry Engineer Training

1. Automated Software Testing for Software Design Engineer in Test (SDET), LG Electronics, Dec 21-23, 2015
2. Software Quality Assurance, ETRI, Aug 2015
3. Automated Software Testing for Software Design Engineer in Test (SDET), LG Electronics, Feb 9-11, 2015
4. Software Quality Assurance, ETRI, Aug 2014
5. Software Quality Assurance, ETRI, Jan 2014

Professional Activities

✚ International Journal Editorial Board/Associative Editor/

1. Journal of Software Testing, Verification and Reliability (STVR) published by John Wiley & Sons, 2016.6 – now
 - SCIE, IF:1.348
2. Journal of Computing Science and Engineering (JCSE) published by KIISE, 2012.5-now

✚ International Conference/Symposium Organizer:

1. Symposium co-chair: Intl. Conf. on Software Engineering (ICSE) New Faculty Symposium (NFS), Austin TX, US, 2016
2. Publication chair: Intl. Conf. on Software Testing, Verification and Validation (ICST), Chicago IL, US, 2016
3. Program co-chair: Workshop on Future Computer Science & Information technology (CQUT-KAIST Joint-Workshop), CQUT, China, Jan 7, 2016
4. Publication chair: IEEE/ACM Intl. Conf. on Automated Software Engineering (ASE), Lincoln NE, US, 2015
5. Program co-chair: Intl. Conf. on Advances in System Testing and Validation Lifecycle (VALID), Porto, Portugal, 2009
6. Program co-chair: 6th International Symposium on Automated Technology for Verification and Analysis (ATVA), Seoul, Korea 2008

✚ International Conference Program Committees

1. IEEE/ACM Automated Software Engineering (ASE) tools track, 09, 13

2. IEEE/ACM Intl. Workshop on Automation of Software Test (AST), 14
3. Adaptive and Reconfigurable Embedded Systems (APRES), 08-09,11,12,13
4. Asia-Pacific Software Engineering Conference (APSEC), 14
5. Automated Technology for Verification and Analysis (ATVA), 07, 09, 12,13,14,16
6. IEEE Computer Software and Applications Conf. (COMPSAC), 10
7. Formal Methods (FM), 09
8. ACM Foundations of Software Engineering (FSE) Student Research Competition (SRC), 14
9. IEEE Intl. Conf. on Engineering of Complex Computer Systems (ICECCS), 13,14
10. Intl. Conf. on Embedded Software and Systems (ICCESS), 07
11. Intl. Conf. on Software Engineering (ICSE), 14,15, 16 (**Program Board**), 17
12. Intl. Conf. on Software Engineering (ICSE) Formal demonstrations track, 12
13. Intl. Conf. on Software Engineering (ICSE) Student Research Competition (SRC), 13
14. Intl. Conf. on Software Testing, Verification and Validation (ICST), 15,16,17
15. Intl. Colloquium on Theoretical Aspect of Computing (ICTAC), 09,10,11,12
16. IEEE Intl. Symposium on Software Reliability Engineering (ISSRE) 14,15,16
17. Intl. Symposium on Software Testing and Analysis (ISSTA), 14,17
18. Intl. Symposium on Software Testing and Analysis (ISSTA) Tool demo track, 16
19. Quality Software (QSIC), 09,10,11
20. Runtime Verification (RV), 07,08,09
21. Brazilian Symp. On Formal Methods (SBMF), 09
22. Intl. Conf. on Secure Software Integration and Reliability Improvement (SSIRI), 11
23. Testing: Academic and Industrial Conference on Practice and Research Techniques (TAIC PART), 13
24. Verified Software: Theories, Tools and Experiments (VSTTE), 14
25. Verified Software: Theories, Tools and Experiments (VSTTE) tools & experiment workshop, 10

✚ Domestic Conference Program Chairs

1. Korean Software Engineering Forum, HKUST, Hong Kong, Nov 21, 2014
2. Korea Conf. on Software Engineering (KCSE), Pheonix park, Kangwon-province, Feb 8-10, 2012

✚ Domestic Conference Program Committees

1. Korea Conf. on Software Engineering (KCSE), 2007-2016
2. Korea Conf. on Computing (KCC), 2009, 2011-2016

✚ Korean Government Committees

1. Creativity-Convergence Research Idea Competition, Review Panel, Ministry of Education and NRF, 2014
2. KFTC (Korea Fair Trade Commission) Fair Trade Committee for Software Subcontract, 2012
3. NIPA (National IT Industry Promotion Agency) Software R&D Quality Improvement Committee, 2011
4. IITA Software Technology RFP Committee, 2008

✚ Professional Associations

1. Member of ACM
2. Member of IEEE Computer Society
3. Member of KIISE (Korean Institute of Information Scientists and Engineers)
4. Board Member of KIISE Software Engineering Society

Awards

1. Best paper award:

- Intl. conf.
 1. Y. Kim, S. Hong, B. Ko, L. Phan and M. Kim, Invasive Software Testing: Mutating Target Programs to Diversify Test Exploration for High Test Coverage, IEEE International Conference on Software Testing, Verification and Validation (ICST), 2018, Distinguished paper award, (acceptance rate:25%)
- Domestic conf.
 1. 김현우, 김윤희, 김문주, Concolic 테스트 도구 CREST 의 사용자 친화성 향상 연구: Windows OS 로의 포팅과 개선된 CREST UI 을 통한 CREST 활용 및 분기 커버리지 분석 작업의 효율 증가, Korea Conference on Software Engineering (KCSE), Jan 29-31, 2018 (Best paper award)
 2. 임현수, 김윤희, 김문주, 시스템 테스트 케이스를 이용한 C 프로그램의 동적 유닛 입력 값 자동 수집 및 재연 기술, Korea Software Congress (KSC), Dec 20-22, 2017 (Distinguished best paper award)
 3. Phan Duy Loc, 고봉석, 김윤희, 김문주, COMUT: 사용자의 의도대로 효과적인 변이를 생성할 수 있는 C 프로그램 변이 도구, Korea Software Congress (KSC), Dec 20-22, 2017 (Best paper award)

4. 김윤호, 김현우, 양웅규, 김문주, 효과적인 변이 분석을 위한 C 프로그램 변이 도구 비교: Proteum 과 Milu 를 사용한 사례 연구, Korea Computer Congress (KCC), Dec 21-23, 2016 (Best paper award) Y.Kim and M.Kim, Automated Unit-test Generation for Detecting Vulnerabilities of Android Kernel Modules, Korea Computer Congress (KCC), Jun 29-Jul 1, 2016 Y.Kim and M.Kim, Automated Unit-test Generation for Detecting Vulnerabilities of Android Kernel Modules, Korea Computer Congress (KCC), Jun 29-Jul, 2016
 5. T.Kim, M.Kim, H.Lee, H.Jang, and M.Park, Detecting Integer Promotion Bugs with Embedded Software using Static Analysis Technique, Korea Computer Congress (KCC), Dec 17-19, 2015
 6. S.Moon, M.Kim, Automated Precise Fault-Localization Utilizing Testing Results on Program Mutant, Korea Conference on Software Engineering (KCSE), Feb 12-14, 2014
 7. Korea Computer Congress (KCC), CREST-BV: Concolic Testing Technique for Supporting Bitwise Operations of Embedded Software, June 27-29, 2012
 8. Korea Conf. on Software Engineering (KCSE), Model-based Kernel Testing through Counter Example Replay, Feb 2009
2. **Best short paper award:**
- Y.Kim and M.Kim, Efficient Symbolic Search Strategy Using Input Coverage, Korea Conference on Software Engineering (KCSE), Feb, 2016 (short paper)
 - Y.Park, S.Hong, M.Kim, J.Cho, D.Lee, and H.Jang, Automated Testing Technique for Event-driven Embedded Software: Case Study on LG Micro-oven Software, Korea Conference on Software Engineering (KCSE), Jan 28-30, 2015 (short paper)
 - Y.Park, Y.Kim, J.Cho, M.Kim, Effective Concolic Testing with Symbolic Library, Korea Conference on Software Engineering (KCSE), Feb 12-14, 2014
3. **Achievement Award** from KIISE Software Engineering Society, Jan 2013

Teaching Experience

✚ Undergraduate Classes

- | | |
|---|---|
| 1. CS101 Intro. To Programming: | Spring 12-18 |
| 2. CS350 Intro. to Software Engineering: | Spring 08, 15, Fall 16 |
| 3. CS402 Intro. To Logic: | Fall 07, Spring 11-13 |
| 4. CS408 Computer Science Project: | Spring 10 |
| 5. CS453 Automated Software Testing: | Fall 09-16 |
| 6. CS492B Understanding of Concurrent Programs: | Spring 14, Spring 16 (w/ Prof. Jaehyuk Hur) |
| 7. CS492D Automated Analysis of Software: | Fall 17 |

✚ Graduate Classes

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|---|----------------------|
| 1. CS750 Advanced Automated SW Testing Tech.: | Fall 14 |
| 2. CS550 Software Engineering: | Spring 07, Spring 09 |
| 3. CS655 System Modeling and Analysis: | Fall 08 |
| 4. CS750B Software Model Checking: | Fall 06 |