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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

- Sep 2019-present: Chief Executive Officer, VPlusLab Inc.
- 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: ~3400, H-index: 30)

✚ Refereed International Journal Papers

1. N.Lee, Y.Kim, M.Kim, D.Ryu and J.Baik, Directed Model Checking for Fast Abstract Reachability Analysis, IEEE Access, Volume 9, page 158738-158750, Nov 25, 2021.
2. Y.Kim, D.Lee, J.Baek, M.Kim, MAESTRO: Automated Test Generation Framework for High Test Coverage and Reduced Human Effort in Automotive Industry, Information and Software Technology (IST), Volume 123, July 2020

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

3. Y.Kim, S.Mun, S.Yoo, and M.Kim, Precise Learn-to-Rank Fault Localization using Dynamic and Static Features of Target Programs, ACM Transactions on Software Engineering and Methodology (TOSEM), Volume 28 Issue 4, October 2019
4. 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
5. 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
6. 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
7. 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
8. 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
9. 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
10. 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
11. 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
12. 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
13. 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
14. 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 (FMDS), vol 24, no 2, pages 129-155, Mar 2004
15. 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. A. Lee, I. Ariq, Y. Kim, and M. Kim, POWER: Program Option-Aware Fuzzer for High Bug Detection Ability, IEEE International Conference on Software Testing, Verification and Validation (ICST), April 4 - 13, 2022
2. R. S. Herlim, Y. Kim, and M. Kim, CITRUS: Automated Unit Testing Tool for Real-world C++ Programs, IEEE International Conference on Software Testing, Verification and Validation (ICST), April 4 - 13, 2022
3. R. Herlim, S. Hong, Y. Kim, and M. Kim, Empirical Study of Effectiveness of EvoSuite on the SBST 2020 Tool Competition Benchmark, Proceedings of the 13th International Symposium on Search Based Software Engineering - Replications and Negative Results (RENE) Track, Bari, Italy, October 11-15, 2021
4. S.Kannan, M.Kim, I.Lee, O.Sokolsky and M.Viswanathan, A Retrospective Look at the Monitoring and Checking (MaC) Framework, Runtime Verification (RV), Porto, Portugal, Oct 10, 2019 (**Test of Time Award**)
5. Y. Kim, S. Hong and M. Kim, Target-driven Compositional Concolic Testing with Function Summary Refinement for Effective Bug Detection, The ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), ALLINN, ESTONIA, AUGUST 26-30 2019 (**acceptance rate: 24.4%**)
6. Y. Kim, D. Lee, J. Baek, and M. Kim, Concolic Testing for High Test Coverage and Reduced Human Effort in Automotive Industry, Intl. Conf. on Software Engineering (ICSE) Software Engineering In Practice (SEIP) track, Montreal, Canada, May 25-31, 2019 (**acceptance rate:25%**)
7. 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%**)
8. 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%**)
9. L. Phan, Y. Kim, M.Kim, MUSIC: Mutation Analysis Tool with High Configurability and Extensibility, Mutation Workshop, 2018
10. 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%**)

11. 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%**)
12. 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
13. 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%**)
14. 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%**)
15. 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%**)
16. 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
17. 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%**)
18. 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
19. 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
20. 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
21. 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
22. 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%**)
23. 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%**)
24. 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%)**
25. 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%**)
26. 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**)
27. 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
28. 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
29. 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%**)
30. 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
31. 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)
32. 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

33. 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%)**
34. 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
35. 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%)**
36. 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)
37. 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
38. 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
39. 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
40. 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%)**
41. 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
42. 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
43. 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
44. 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
45. 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
46. 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
47. 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%)**
48. 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)**
49. 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
50. 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
51. 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
52. 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
53. 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. 이아청, 김윤호, 김문주, 커맨드 라인 옵션을 변이 및 선택하여 테스트링 효과를 높이는 퍼징 기법, Journal of KIISE, Vol.49, Num. 11, Nov 2022
2. 이아청, 김윤호, 김문주, 동적 함수 관련도를 이용한 퍼징 커버리지 향상 기법, Journal of KIISE, Vol.48, Num. 4, Apr 2021
3. 박건우, 이주현, 송형근, 조규태, 김윤호, 김문주, 국방 무기 체계 SW 품질 향상을 위해 Concolic 테스트를 통한 테스트 자동 생성, Journal of KIISE, Vol. 46, Num. 9, Nov 2019
4. 김현우, 김윤호, 김문주, Concolic 테스트 도구 CROWN의 적용 가능성 및 사용성 개선 연구, Journal of KIISE: Software and Applications, Vol. 45, Num. 10, Oct 2018
5. 임현수, 김윤호, 김문주, C 프로그램의 동적 및 정적 분석을 통한 시스템 실행에서의 유닛 입력 값 자동 수집 및 재연, Journal of KIISE: Software and Applications, Vol. 45, Num. 10, Oct 2018
6. 김윤호, 김현우, 양용규, 김문주, 효과적인 변이 분석을 위한 C 프로그램 변이 도구 비교: Proteum 과 Milu 를 사용한 사례 연구, Journal of KIISE: Software and Applications, Vol. 45, Num. 4, Apr 2018
7. 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
8. 전이루, 김윤호, 홍신, 김문주, Mutagen4J: 효과적인 Java 프로그램 변이 생성 도구, Journal of KIISE: Software and Applications, Vol. 43, Num. 9, Sep 2016
9. 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
10. 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
11. 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
12. 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
13. 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
14. Y.Kim, M.Kim, Y.Jang, CREST-BV: An Improved Concolic Testing Technique Supporting Bitwise Operations for Embedded Software, Journal of KIISE: Software and Applications, To be published
15. 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
16. 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. 김윤삼, 김문주, Concolic 테스트링과 Fuzzing 을 결합한 유닛 테스트 자동화 기술, Korea Conference on Software Engineering (KCSE), Jan 2022 (short paper)
2. 이아청, 김윤호, 김문주, 유용한 커맨드 라인 옵션을 선택하여 커버리지와 오류 탐지 능력을 높이는 퍼징 기법, Korea Software Congress (KSC), Dec 20-22, 2021 (**Best paper award**)
3. 이아청, 김윤호, 김문주, 함수 관련도를 이용한 퍼징의 커버리지 향상, Korea Software Congress (KSC), Dec 18-20, 2019 (**Best paper award**)
4. 박건우, 송형근, 이주현, 조규태, 김윤호, 김문주, 국방 무기 체계 SW 품질 향상을 위한 Concolic 테스트링 기술, Korea Software Congress (KSC), Dec 19-21, 2018 (**Distinguished best paper award**)
5. 홍신, 김윤호, 김문주, 윤석영, 정한웅, 박사천, AtomicitySanitizer: C 멀티쓰레드 프로그램에 대한 실행연속성 위반 결합 검출 도구, Korea Software Congress (KSC), Dec 19-21, 2018 (**Best presentation award**)
6. 이아청, 김현우, 김윤호, 김문주, Bitfield 심볼릭 지원을 통한 Concolic 테스트링 효과 향상, Korea Computer Congress (KCC), Jun 20-22, 2018
7. 김현우, 김윤호, 김문주, Concolic 테스트링 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**)
8. 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**)
9. Phan Duy Loc, 고봉석, 김윤호, 김문주, COMUT: 사용자의 의도대로 효과적인 변이를 생성할 수 있는 C 프로그램 변이 도구, Korea Software Congress (KSC), Dec 20-22, 2017 (**Best paper award**)

10. 김윤호, 김현우, 양응규, 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
11. 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**)
12. 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**)
13. 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**)
14. 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**)
15. 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**)
16. Y.Moon, M.Kim, T.Kim, Development of Architecture Description Language for Embedded Systems, Korea Computer Congress (KCC), Nov 15-16, 2013
17. J.Ahn, M.Kim, Survey of Faults of Web Applications in Javascript, Korea Conference on Software Engineering (KCSE), Jan 30 - Feb 1, 2013
18. 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)
19. 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**)
20. 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**)
21. 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)
22. 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)
23. 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)
24. 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**)
25. 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
26. Y.Kim and M.Kim, Comparative Study on Concolic Testing Tools, Korea Conf. on Software Engineering (KCSE), Feb 8-10, 2010
27. 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**)
28. 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. GENERATING METHOD AND APPARATUS OF MUTANT PROGRAMS, WHICH IS FLEXIBLE AND HIGHLY SCALABLE (10-2114549-0000), patent registered on 2020-05-18
2. TESTING METHOD AND APPARATUS OF TARGET PROGRAM USING MUTATED PROGRAM (10-2114548-0000), patent registered on 2020-05-18
3. TESTING METHOD AND APPARATUS OF TARGET FUNCTION INCLUDE IN TARGET PROGRAM (10-2114547-0000), patent registered on 2020-05-18
4. Automated Testing Method and Apparatus for Program Processable Non-Deterministic Events (10-1685299-0000), patent registration on Dec 05, 2016
5. Device and Method For Statistical Model Checking Using Hybrid Technique (10-2013-0144946), patent registration on May 6, 2015
6. 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
7. Method of Distributed Scalable Concolic Testing for Software Reliability (10-1227024-0000), patent registration on Jan 22, 2013

Invited Talks

International Invited Talks

1. Conf. Keynote Talk: CROWN 2.0: Automated Test Generation for Industrial Embedded Software - 17 Years Journey from Research To Product, ACM/IEEE International Conference on Automation of Software Test (AST), Jul, 2020
2. Conf. Keynote Talk: Lessons Learned from Automated Analysis of Industrial SW for 15 Years, The 15th Intl. Conf. on Formal Aspects of Component Software (FACS), Oct 10-12, 2018
3. Ask the Mutants: Mutating Faulty Programs for Fault Localization, HKUST, Hong Kong, Nov 5, 2013
4. Automated Testing of Industrial Embedded Software (Computer Science and Engineering Department Seminar), HKUST, Hong Kong, Nov 4, 2013
5. Automated Testing of Industrial Embedded Software, National Institute of Informatics (NII), Japan, Aug 14, 2013
6. Automated Testing of Industrial Embedded Software, JAIST, Japan, Aug 12, 2013
7. Automated Analysis of Industrial Embedded Software, Microsoft Research Asia (MSRA), China, June 18, 2013
8. Real-world Application of Concolic Testing Approach, National University of Singapore (NUS), Singapore, Jan 10, 2012
9. Automated Analysis of Industrial Embedded Software, National University of Singapore (NUS), Singapore, Jan 9, 2012
10. Automated Analysis of Industrial Embedded Software, the 9th intl. symposium on Automated Technology for Verification and Analysis (ATVA), Taipei, Taiwan, Oct 14, 2011
11. Comparative Study on Software Model Checkers as Unit Testing Tools: An Industrial Case Study, Kyushu Univ. Japan, Jan 25, 2010
12. Formal Verification of a Flash Memory Device Driver, Academia Sinica, Taiwan, Jan 17, 2008
13. 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
14. Formal Verification of Flash Memory Software, NEC laboratories Princeton US, Aug 20, 2007
15. Formal Specification & Verification of USP Flash Translation Layer, Univ. of Pennsylvania, July 20, 2007
16. 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 Software Testing Technique and its Successful Application to Automotive Industries, Chungnam Natl. Univ, Dec 3, 2021
2. Automated Unit Testing Techniques 2/2, Hyundai Motors, Nov 26, 2021
3. Automated Unit Testing Techniques 1/2, Hyundai Motors, Sep 9, 2021
4. Automated Software Testing, 현대자동차, Sep 10, 2020
5. Automated Software Testing to Improve Bug Detection Ability and Reduce Testing Cost, 국가보안기술연구소 세미나, Aug 31, 2020
6. Automated Software Testing to Improve Bug Detection Ability and Reduce Testing Cost, 삼성 DIT 세미나, Aug 21, 2020
7. SW Unit 테스트, K-MOOC 묶음 강좌, Aug 18, 2020
8. Automated Software Testing, 현대자동차, July 13, 2020
9. Logic coverage, 국가보안기술연구소 세미나, July 6, 2020
10. Software Engineering, 삼성전자 DS SW 테스트 세미나, July 3, 2020
11. Graph coverage, 국가보안기술연구소 세미나, May 27, 2020
12. Automated Software Testing, 삼성전자 메모리 사업부 Solution PE 팀, Dec 3, 2019
13. AI 기술을 활용한 자동차 SW 안정성 검증, 매경 빅데이터/인공지능 최고위 과정, June 13, 2019
14. Automated Software Analysis Techniques, 국가보안기술연구소, May 16, 2019
15. Automated Software Analysis Techniques For High Reliability: A Concolic Testing Approach, 현대모비스, May 2, 2019
16. 소프트웨어 중심의 환경 변화에 대응하기 위한 혁신 방향, 현대자동차 Automotive Electronics Expert Society (AAES) 포럼 초청 연사, Nov 6, 2018
17. Automated Software Analysis Techniques For High Reliability: A Concolic Testing Approach, LIG 넥스원, Nov 16, 2018
18. SW 오류 검출을 위한 동적 테스트케이스 자동 생성 기법- Concolic Testing, Mando, Sep 7, 2018
19. SW 오류 검출을 위한 동적 테스트케이스 자동 생성 기법- Concolic Testing, Samsung Electronics, Aug 10, 2018

20. PRINCE: PRecise machINe learning-based fault loCalization tEchnique, Sungkyunkwan Univ., July 25, 2018
21. SW 오류 검출을 위한 동적 테스트케이스 자동 생성 기법- Concolic Testing, 국보연, July 24, 2018
22. Automated SW Testing Techniques, Samsung Research, May 25, 2018
23. SW 오류 검출을 위한 동적 테스트케이스 자동 생성 기법- Concolic Testing, Handong Global Univ., May 21, 2018
24. SW 오류 검출을 위한 동적 테스트케이스 자동 생성 기법- Concolic Testing, KISTI, May 15, 2018
25. Safety Verification of Deep Neural Networks, Samsung Research, May 3, 2018
26. SW 오류 검출을 위한 동적 테스트케이스 자동 생성 기법, POSTECH, May 2, 2018
27. PRINCE: PRecise machINe learning-based fault loCalization tEchnique, Samsung Research, March 29, 2018
28. Destructive Software Testing: Mutating a Target Program to Diversify Test Exploration for High Test Coverage, Samsung Research, March 2, 2018
29. Precise Concolic Unit Testing, Samsung Research, Jan 26, 2018
30. Logic coverage criteria, Samsung SW Center, Nov 24, 2017
31. SW 오류 검출에 효과적인 테스트 케이스 자동 생성 기법: Concolic 테스트, 제 4 회 국제 품질.테스팅 컨퍼런스 세미나, Nov 22, 2017
32. Coverage criteria for white-box testing, Hyundai Mobis, Nov 13, 2017
33. Graph Coverage Criteria, Samsung SW Center, Oct 27, 2017
34. 결함 위치추정(Fault Localization) 기법, Samsung SW Center, Sep 22, 2017
35. Thread Scheduling 시나리오 등의 Concurrent Program 테스트 기술 자문, Samsung SW Center, Aug 28, 2017
36. Concolic Test 시 True Positive 를 늘리고 False Positive 를 줄일 수 있는 방법, Samsung SW Center, July 27, 2017
37. SW 오류 검출에 효과적인 테스트 케이스 자동 생성 기법: Concolic 테스트, Hyundai Mobis, June 15, 2017
38. SW 품질 향상을 위한 SW 코드 커버리지 검증 강화 연구, Hyundai Motors, June 9, 2017
39. Mutation Testing, Hyundai Motors, Dec 9, 2016
40. Workshop Keynote Talk: SW 오류검출을 위한 동적 테스트케이스 자동생성기법, 소프트웨어 시스템 실행에 대한 모니터링과 분석 워크샵, Nov 24, 2016
41. SW 오류 검출에 효과적인 테스트 케이스 자동 생성 기법, 국방 SW 워크샵, Sep 27, 2016
42. 변형 분석 기법을 (Mutation Analysis) 사용한 정확한 SW 결함 위치 추정, Samsung Electronics, July 12, 2016
43. Automated Testing and Debugging for Corner-case Bugs in Complex Software, Samsung Electronics, June 28, 2016
44. Automated White-Box Software Testing, ITRC SSRC Seminar, April 29, 2016
45. Automated Testing of Industrial Embedded Software, Chassis Control Dept. of Hyundai Motor Group, Nov 18, 2015
46. Automated Testing of Industrial Embedded Software, Suresoft, Sep 1, 2015
47. Automated Testing of Industrial Embedded Software, Integrated Safety Control Dept. of Hyundai Motor Group, June 15, 2015
48. Application of Symbolic Execution: Systematic Testing of Reactive Software with Non-deterministic Events, KAIST Graduate School of Information Security Workshop, June 5, 2015
49. Vision for Automated Software Testing in Korea IT Industry, IITP ITRC Forum, May 28, 2015
50. Automated Testing of Industrial Embedded Software, Hyundai Motor Group Chassis Safety Forum, Jan 30, 2015
51. False Alarm Reduction Technique for Automated Concolic Unit testing, ERC ROSAEC Winter Workshop, Jan 28, 2015
52. Clang and LLVM API for Source Code Refactoring, Samsung Electronics, Nov 12, 2014
53. Software Model Checking, Test Midas, Oct 16, 2014
54. Ask the Mutants: Mutating Faulty Programs for Fault Localization, Test Midas, Sep 25, 2014
55. Automated Testing of Industrial Embedded Software using Concolic Testing, GIST, Sep 5, 2014
56. Automated Testing of Industrial Embedded Software using Concolic Testing, Test Midas, Sep 4, 2014
57. Code Coverage-based Testing of Concurrent Programs, Samsung Electronics, July 3, 2014
58. Automated Testing of Industrial Embedded Software using Concolic Testing, Ajou University, June 17, 2014
59. Automated Testing of Industrial Embedded Software using Concolic Testing, LG Electronics, May 23, 2014
60. Automated Unit Testing of Large Industrial Embedded Software using Concolic Testing, Kyungpook National University, Dec 20, 2013
61. Automated Testing of Industrial Embedded Software, LG Electronics, Oct 1, 2013
62. Automated Testing of Industrial Embedded Software, Coverity Workshop keynote seminar, Sep 13, 2013
63. Industrial Application of Concolic Testing to Detect Crash Bugs- A Case Study on libexif, Korea Univ., July 3, 2013
64. Automated Testing of Industrial Embedded Software, Samsung Electronics, July 9, 2013
65. Testing Concurrent Programs to Achieve High Synchronization Coverage, Samsung Electronics, Oct 25, 2012
66. Real-world Application of Concolic Testing Approach, LG Electronics, Sep 6, 2012

67. Automated Testing of Industrial SW: Concolic Testing Approach, LG Electronics, July 25, 2012
68. Real-world Application of Concolic Testing Approach: Part II“, Suresoft, May 21, 2012
69. Real-world Application of Concolic Testing Approach: Part I“, Suresoft, May 17, 2012
70. Automated Software Testing Techniques, NIPA Software Quality Insight Seminar, July 5, 2011
71. Automated Software Testing Techniques for High Reliability, NIPA Software Quality Insight Seminar, Jan 27, 2011
72. Automated Software Analysis Techniques for High Reliability, Korea Univ. Nov 4, 2010
73. Automated Test Case Generation through Concolic Testing Techniques, Samsung Electronics, Feb 17, 2010
74. Systematic Unit Analysis Techniques for Embedded C Programs, Fasoo.com, Dec 15, 2009
75. Automated Software Analysis Techniques : Past, Present, and Future, Samsung Tech Fair, Samsung Advanced Institute of Technology (SAIT), Nov 19, 2009
76. Systematic Unit Analysis Techniques for Embedded C Programs, Samsung Electronics, Oct 16, 2009
77. Unit Testing of Flash Memory Device Driver through a SAT-based Model Checker, Chonbuk Natl. Univ., Oct 13, 2009
78. Formal Verification Techniques for Embedded Software, Samsung Electronics, Mar 18, 2009
79. Industrial Case Studies based on Software Model Checking, ETRI, July 2, 2008
80. Formal Specification & Verification of USP Flash Translation Layer, Seoul National Univ., Apr 19, 2008
81. SAT-based analysis for C Programs, KIISE SIGPL Winter School, KAIST, Feb 1st, 2008
82. MacDebugger: A Monitoring and Checking (MaC) based Debugger for Model Checkers, KIISE SE Society Tutorial, Sogang Univ, May 31, 2007
83. Formal Specification and Verification of USP Flash Translation Layer, Samsung Electronics, Mar 20, 2007
84. Formal Debugging through Model Checking and Runtime Verification, Korea Univ., Mar 14, 2007
85. Model Checking of Flash Device Driver, Kyungpook National Univ., Mar 7, 2007
86. Programming Language in Software Engineering, KIISE SIGPL Winter School, Feb 9, 2007
87. MacDebugger: A Monitoring and Checking (MaC) based Debugger for Formal Models, KAIST, Sep 25, 2006

Research Funding (total amount: KRW 6,773,803,000)

✚ Funding from Korean Government Agencies (total amount: KRW 5,036,103,000)

1. Center for Software Disaster Research, June 2021-now, supported by National Research Foundation of Korea (NRF) (KRW 110,000,000)
2. Effective and Efficient SW Unit Fuzzing for Regression Testing, Mar 2021-Feb 2024, Mid-career Research Program (MRP) supported by National Research Foundation of Korea (NRF) (KRW 577,361,000)
3. Dynamic and Static SW Data-driven Automated SW Fault Detection and Localization, June 2019-May 2021, Mid-career Research Program (MRP) supported by National Research Foundation of Korea (NRF) (KRW 154,687,000)
4. Intelligent Automation Techniques for Verification and Debugging of Fullstack Multilingual Software (Chief Principal Investigator (총괄책임)), Sep 2017-Mar 2021, Next-Generation Information Computing Development Program supported by National Research Foundation of Korea (NRF) (KRW 2,340,000,000)
5. Automated SW testing and debugging techniques for improving SW quality, June 2016-May 2019, Mid-career Research Program (MRP) supported by National Research Foundation of Korea (NRF), (KRW 297,000,000)
6. Behavioral Coverage for Effective Software Testing, Dec 2014-Dec 2016, Global Research Network (GRN) by National Research Foundation of Korea (NRF) (KRW 80,000,000)
7. 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)
8. 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)
9. 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)
10. 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)
11. Performance Bug Detection Framework for JavaScript Programs, Aug 2012-June 2013, Microsoft Korea (KRW 60,000,000)
12. Highly Reliable Micro Dual Operating System, June 2012-Feb 2017, Electronics and Telecommunications Research Institute (ETRI) (KRW 200,000,000)
13. Dynamic Analysis of Embedded Software, Dec 2011-Dec 2013, FormalWorks Inc. (KRW 100,000,000)
14. Application of Dynamic Symbolic Execution for Binary Programs, April 2011-Oct 2011, National Security Research Institute (NSRI) (KRW 35,000,000)
15. Improved Automated Test Case Generation through Parallelized Concolic Testing Technique, May 2010-April 2011, National Research Foundation (NRF) (KRW 49,996,000)

16. Concurrency Bug Detection through Improved Pattern Matching Using Semantic Information, May 2009-April 2010, National Research Foundation (NRF) (KRW 48,369,000)
17. Advanced Technology for Software Process Improvement (Part of ITRC Software Process Improvement Center), Jan 2009-Dec 2010, IITA (KRW 33,400,000)
18. SAT Solver Based Verification of Embedded Software for Improved Reliability, July 2008-June 2009, Korea Research Foundation (KRF) (KRW 26,400,000),
19. 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 1,517,700,000)

1. AI-based Testing Techniques for Improving SW Reliability of Defense Weapons, LIGnex1, May 2022- April 2024 (KRW 100,200,000)
2. Improving Automated Test Code Generation Using Concolic Testing, Dec 2018- July 2019, Mobis, (KRW 80,000,000)
3. Concolic Testing for Efficient SW Testing, Dec 2018-June 2019, Mando (KRW 50,000,000)
4. Improving Requirement-based Dynamic Reliability Testing, Mar 2018- Oct 2018, LIGnex1 (KRW 60,000,000)
5. Tool Development for Windows Multi-threaded Programs, Nov 2017- Nov 2018, Samsung Electronics (KRW 90,000,000)
6. Automated Test Code Generation Using Concolic Testing, Oct 2017- July 2018, Mobis, (KRW 85,000,000)
7. Improving Software Coverage for High Software Quality, Apr 2016-May 2017, Hyundai Motor Group (KRW 59,500,000)
8. Automated Testing and Debugging Techniques, July 2015-June 2020, Samsung Electronics (KRW 380,000,000)
9. Application of Concolic Testing to the Software of Hyundai Motors, May 2015-Apr 2016, Hyundai Motor Group (KRW 51,000,000)
10. Integer Promotion Bug Detection For Micro-Controller Software of Home Appliances, Mar-Sep 2015, LG Electronics (KRW 60,000,000)
11. Testing and Replaying Framework for Multi-threaded Programs, June-Dec 2014, Samsung Electronics (KRW 50,000,000)
12. Effective and Efficient Embedded Software Testing by Using Concolic Testing Technique, Apr-Aug 2014, LG Electronics (KRW 50,000,000)
13. Improved Testing Accuracy and Bug Detection Capability for Concolic Testing Technique, Mar-Dec 2014, Samsung Electronics (KRW 97,000,000)
14. Unit Testing Strategies for Effective Concolic Testing, Feb 2013-Nov 2013, Samsung Electronics (KRW 97,000,000)
15. Advanced Concolic Testing Framework, Mar 2012-Dec 2012, Samsung Electronics (KRW 90,000,000),
16. Automated Test Case Generation Through Concolic Testing, Mar 2011-Oct 2011, Samsung Electronics (KRW 70,000,000)
17. Automated Test Case Generation Through Concolic Testing, June 2010-Dec 2010, Samsung Electronics (KRW 60,000,000)
18. Formal Verification of a Flash File System, Nov 2007-Aug 2008, Samsung Electronics (KRW 49,000,000)
19. Applicable Formal Verification Techniques on Embedded Systems, Sep 2006-April 2009, LG Electronics (KRW 19,000,000)

✚ Funding from KAIST (total amount: KRW 220,000,000)

1. Automated Bug Detection Using Destructive SW Testing, Apr 2017-Dec 2017, KAIST HRHR project (KRW 40,000,000)
2. Software Verification Techniques for Improved Productivity of Embedded Software, Jan 2008-Dec 2008, KAIST IT Institute (KRW 30,000,000)
3. Formal Analysis of Embedded Software for High Reliability, Sep 2006-Dec 2008, KAIST (KRW 150,000,000)

Industry Consulting (total amount: KRW 210,100,000)

1. Automated Testing Techniques, June 2017- May 2018, Samsung Research (KRW 14,400,000)
2. Automated Unit Testing Techniques, Sep 2015-Dec 2015, LG Electronics (KRW 29,900,000)
3. Automated Embedded Software Testing Through Concolic Testing, Jan 2013-Dec 2013, LG Electronics (KRW 80,000,000)
4. Automated Embedded Software Testing Techniques, Oct 2012-Dec 2012, LG Electronics (KRW 28,600,000)
5. Formal Verification of Operation Systems, Aug 2011-Nov 2011, Samsung Advanced Institute of Technology (SAIT) (KRW 27,200,000)
6. 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. Intro. To Python Programming, KIRD (Korea Institute of R&D Human Resource Development), Oct 5, 6, 19,20, Nov 2, 3, 2021
2. Static and Dynamic Software Verification Techniques, Hyundai AutoEver, Aug 19-20, 2021
3. Intro. To Python Programming, KIRD, July 6,7,20,21, Aug 3, 4, 2021
4. Intro. To Python Programming, KIRD, Mar 16,17,30,31, April 13,14, 2021
5. Software Testing Techniques, Samsung SDS, July 9, 22, 23, 2019
6. Hynix Machine Learning Course, June 24, 2019
7. Automated Software Analysis Techniques For High Reliability: A Concolic Testing Approach, Mobis, May 2, 2019
8. Automated Test Input Generation for SW Bug Detection, Mando, Sep 7, 2018
9. Software Testing Techniques, Samsung SDS, July 10, 16, 17, 2018
10. Automated Software Testing for Software Design Engineer in Test (SDET), LG Electronics, Jun 25-28, 2018
11. White-box Testing Techniques, Mobis, Nov 13, 2017
12. Automated Software Testing for Software Design Engineer in Test (SDET), LG Electronics, Dec 21-23, 2015
13. Software Quality Assurance, ETRI, Aug 2015
14. Automated Software Testing for Software Design Engineer in Test (SDET), LG Electronics, Feb 9-11, 2015
15. Software Quality Assurance, ETRI, Aug 2014
16. Software Quality Assurance, ETRI, Jan 2014

Professional Activities

✚ International Journal Editorial Board/Associative Editor

1. Journal of Software Practice and Experience, Special Issue on Software Engineering In Practice 2020 vol 51, Issue 4, April 2021
2. Journal of Software Testing, Verification and Reliability (STVR) published by John Wiley & Sons, 2016.6 – now
 - SCIE, IF:1.348
3. 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) Software Engineering In Practice (SEIP), Seoul, South Korea, 2020
2. Workshop co-chair: Intl. Symp. On Software Testing and Analysis (ISSTA), Beijing, China, 2019
3. Symposium co-chair: Intl. Conf. on Software Engineering (ICSE) New Faculty Symposium (NFS), Austin TX, US, 2016
4. Publication chair: Intl. Conf. on Software Testing, Verification and Validation (ICST), Chicago IL, US, 2016
5. Program co-chair: Workshop on Future Computer Science & Information technology (CQUT-KAIST Joint-Workshop), CQUT, China, Jan 7, 2016
6. Publication chair: IEEE/ACM Intl. Conf. on Automated Software Engineering (ASE), Lincoln NE, US, 2015
7. Program co-chair: Intl. Conf. on Advances in System Testing and Validation Lifecycle (VALID), Porto, Portugal, 2009
8. 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), 08-09,11-13
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 Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) (ESEC/FSE), 23
9. ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) Student Research Competition (SRC), 14
10. ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), Ideas, Visions and Reflections 20-22
11. ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), Industry Paper, 22

- 12.
13. IEEE Intl. Conf. on Engineering of Complex Computer Systems (ICECCS), 13-14
14. Intl. Conf. on Embedded Software and Systems (ICSS), 07
15. Intl. Conf. on Software Engineering (ICSE) program board, 16, 20
16. Intl. Conf. on Software Engineering (ICSE) program committee, 14, 15, 17, 19, 21
17. Intl. Conf. on Software Engineering (ICSE) Formal demonstrations track, 12
18. Intl. Conf. on Software Engineering (ICSE) Student Research Competition (SRC), 13
19. Intl. Conf. on Software Engineering (ICSE) Workshops, 23
20. Intl. Conf. on Software Testing, Verification and Validation (ICST), 15-17, 23
21. Intl. Colloquium on Theoretical Aspect of Computing (ICTAC), 09-12
22. IEEE Intl. Symposium on Software Reliability Engineering (ISSRE) 14-17, 21
23. Intl. Symposium on Software Testing and Analysis (ISSTA), 14,17, 18, 23
24. Intl. Symposium on Software Testing and Analysis (ISSTA) Tool demo track, 16
25. Quality Software (QSIC), 09-11
26. Runtime Verification (RV), 07-09
27. Brazilian Symp. On Formal Methods (SBMF), 09
28. Intl. Conf. on Secure Software Integration and Reliability Improvement (SSIRI), 11
29. Testing: Academic and Industrial Conference on Practice and Research Techniques (TAIC PART), 13
30. Verified Software: Theories, Tools and Experiments (VSTTE), 14
31. Verified Software: Theories, Tools and Experiments (VSTTE) tools & experiment workshop, 10

✚ Domestic Journal Editorial Board/Associative Editor

1. 정보과학회논문지: 소프트웨어 및 응용분야, 2017- 2019

✚ Domestic Conference Program Chairs

1. Korea Conf. on Software Engineering (KCSE), Pheonix park, Kangwon-province, Feb 8-10, 2012

✚ Domestic Workshop Program Chairs

1. 3rd Workshop for Intelligent Automation Techniques for Verification and Debugging of Fullstack Multilingual Software, KAIST, Daejeon, Jan 30, 2020
2. 2nd Workshop for Intelligent Automation Techniques for Verification and Debugging of Fullstack Multilingual Software, Hanhwa Resort, PyoungChang, Jan 29, 2019
3. 1st Workshop for Intelligent Automation Techniques for Verification and Debugging of Fullstack Multilingual Software, KAIST, Daejeon, Jan 17, 2018
4. Korean Software Engineering Forum, HKUST, Hong Kong, Nov 21, 2014

✚ Domestic Conference Program Committees

1. Korea Conf. on Software Engineering (KCSE), 2007-2022
2. Korea Conf. on Computing (KCC), 2009, 2011-2019

✚ Korean Government Committees

1. DTaQ (Defense Agency for Technology and Quality) Committee for AI-based Software Testing Techniques, Oct, 2019
2. Committee for Maintaining a List of Excellent Conferences in Computer Science, 2018-2019
3. Committee for Advanced Placement (AP) on Computing Courses at KAIST, GIST, DGIST, UNIST, POSTECH, for Science High Schools and Academies of Science, 2018-2022
4. Creativity-Convergence Research Idea Competition, Review Panel, Ministry of Education and NRF, 2014
5. KFTC (Korea Fair Trade Commission) Fair Trade Committee for Software Subcontract, 2012
6. NIPA (National IT Industry Promotion Agency) Software R&D Quality Improvement Committee, 2011
7. 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:

1. Intl. conf.
 1. S.Kannan, M.Kim, I.Lee, O.Sokolsky and M.Viswanathan, A Retrospective Look at the Monitoring and Checking (MaC) Framework, Runtime Verification (RV), Porto, Portugal, Oct 10, 2019, **Test of Time Award**
 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%)
2. Domestic conf.
 1. 이아청, 김윤호, 김문주, 유용한 커맨드 라인 옵션을 선택하여 커버리지와 오류 탐지 능력을 높이는 퍼징 기법, Korea Software Congress (KSC), Dec 20-22, 2021 (Best paper award)
 2. 이아청, 김윤호, 김문주, 함수 관련도를 이용한 퍼징의 커버리지 향상, Korea Software Congress (KSC), Dec 18-20, 2019 (Best paper award)
 3. 박건우, 송형곤, 이주현, 조규태, 김윤호, 김문주, 국방 무기 체계 SW 품질 향상을 위한 Concolic 테스팅 기술, Korea Software Congress (KSC), Dec 19-21, 2018 (Distinguished best paper award)
 4. 홍신, 김윤호, 김문주, 윤석영, 정한웅, 박사천, AtomicitySanitizer: C 멀티쓰레드 프로그램에 대한 실행연속성 위반 결함 검출 도구, Korea Software Congress (KSC), Dec 19-21, 2018 (Best presentation award)
 5. 김현우, 김윤호, 김문주, Concolic 테스팅 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)
 6. 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)
 7. Phan Duy Loc, 고봉석, 김윤호, 김문주, COMUT: 사용자의 의도대로 효과적인 변이를 생성할 수 있는 C 프로그램 변이 도구, Korea Software Congress (KSC), Dec 20-22, 2017 (Best paper award)
 8. 김윤호, 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, 2016Y.Kim and M.Kim, Automated Unit-test Generation for Detecting Vulnerabilities of Android Kernel Modules, Korea Computer Congress (KCC), Jun 29-Jul, 2016
 9. 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
 10. S.Moon, M.Kim, Automated Precise Fault-Localization Utilizing Testing Results on Program Mutant, Korea Conference on Software Engineering (KCSE), Feb 12-14, 2014
 11. Korea Computer Congress (KCC), CREST-BV: Concolic Testing Technique for Supporting Bitwise Operations of Embedded Software, June 27-29, 2012
 12. Korea Conf. on Software Engineering (KCSE), Model-based Kernel Testing through Counter Example Replay, Feb 2009
2. **Best short paper award:**
 1. Domestic conf.
 1. Y.Kim and M.Kim, Efficient Symbolic Search Strategy Using Input Coverage, Korea Conference on Software Engineering (KCSE), Feb, 2016 (short paper)
 2. 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)
 3. 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. **Best Teaching Award**, from Korea Institute of Human Resources Development in Science and Technology (KIRD), May 2022.
4. **Excellence in Teaching Award**, from KAIST July 30, 2020
5. **Certificate of Appreciation**, from IEEE Computer Society, Nov 2015
6. **Achievement Award**, from KIISE Software Engineering Society, Jan 2013

Teaching Experience

✚ Undergraduate Classes

1. CS101 Intro. To Programming: Spring 12-19
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. CS458 Dynamic Analysis of Software Source Code: Fall 22, Spring 23
6. CS453 Automated Software Testing: Fall 09-16
7. CS492B Understanding of Concurrent Programs: Spring 14, Spring 16 (w/ Prof. Jaehyuk Hur)
8. CS492D Automated Analysis of Software: Fall 17, 18
9. CS492B Formal SW Modeling and Verification: Fall 23

✚ Graduate Classes

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

✚ Massive Online Classes for General Audience

1. Intro. To Python Programming on Naver Boostcourse Spring 21
<https://www.boostcourse.org/cs114> (14,000 persons have registered to the online class)
2. Software Testing on K-MOOC (w/ Prof. Shin Yoo @KAIST) Spring 20
http://www.kmooc.kr/courses/course-v1:KAISTk+CS454+2021_K13_01/about
3. CS101 Intro. To Programming (Python) on KOOC: Spring 19
(KAIST Massive Open Online Course)
<https://kooc.kaist.ac.kr/cs101> (11,000 persons have registered to this online class)