Ah-Rim Han

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RESEARCH INTERESTS

Ah-Rim Han is a research professor in the Computer Science Department at Korea University. She has special interests in 1) **assessing and improving software design quality**, and 2) **automating the software refactoring process**. Her main research goal is to provide the methods to make software accommodate changes more easily, which contributes to reduce maintenance costs and shorten time-to-market.

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST), Daejon, Korea
Ph.D., Computer Science, 2007.3 - 2013.8
Thesis: *Identification and Selection of Refactorings for Improving Maintainability of Object-Oriented Software*
Advisor: Doo-Hwan Bae

Korea Advanced Institute of Science and Technology (KAIST), Daejon, Korea
M.S., Computer Science, 2005.3 - 2007.2
Thesis: *Behavioral Dependency Measurement in UML 2.0 Sequence Diagrams for Change-proneness Prediction*
Advisor: Doo-Hwan Bae

Sogang University, Seoul, Korea
B.S., Computer Science, 2000.3 - 2004.2 (Magna Cum Laude)

WORK EXPERIENCE

Korea University, Seoul, Korea Sep. 2013 - Present
Position: Research Professor

- Develop algorithms and tools for the studies of automated refactoring process
- Provide consulting to small companies to adapt the software engineering principles and methodologies into their development process
  (program sponsored by National IT Industry Promotion Agency (NIPA))

Peace Corps (Headquarters), Washington, D.C., USA Aug. 2004 - Nov. 2004
United States Government Agency sending volunteers to foreign countries
Position: Intern

- Serve in organizing and populating the intranet web pages in the Technical Infrastructure and Support Team (under the Chief Information Officer (CIO))

HONORS AND AWARDS

Nov. 2014 - Apr. 2017, **Individual Basic Science & Engineering Research Program**, National Research Foundation of Korea (NRF), $125,000, PI.
Nov. 2013 - Oct. 2014, **Post-Doctoral Fellowship Grant**, National Research Foundation of Korea (NRF), $33,000, PI.
Mar. 2011 - Aug. 2012, **SAMSUNG Scholarship Program**, SAMSUNG Electronics (supported by Video Display Division)
Mar. 2005 - Feb. 2010, **Graduate Student Fellowship**, KAIST

Feb. 2004, **Magna Cum Laude**, Bachelor of Science in Computer Science, Sogang University
Mar. 2000 - Feb. 2004, **Grade Excellence Scholarship**, Sogang University
Mar. 2000, **Admission Excellence Scholarship**, Sogang University

JOURNAL PUBLICATIONS

Kwangsik Song, **Ah-Rim Han***, Sehun Jeong, Sungdeok Cha, "Testing Android Applications considering various contexts inferred from permissions" (in Korean: "안드로이드 어플리케이션 개발에서 퍼미션 분석을 사용한 다양한 테스트 환경 조건 생성 기법"), *Journal of the Korean Institute of Information Scientists and Engineers: Software and Applications* **(KIISE)**, Vol. 42, No. 8, pp. 1021 - 1030, Aug. 2015. (http://dx.doi.org/10.5626/JOK.2015.42.8.1022)

Ah-Rim Han, Doo-Hwan Bae, Sungdeok Cha*, "An efficient approach to identify multiple and independent Move Method refactoring candidates", ***Information and Software Technology*** **(IST)**, Vol. 59, pp. 53-66, Mar. 2015. (http://dx.doi.org/10.1016/j.infsof.2014.10.007) (Impact Factor: 1.522)

Ah-Rim Han*, Doo-Hwan Bae, "Dynamic profiling-based approach to identifying cost-effective refactorings", ***Information and Software Technology*** **(IST)**, Vol. 55, No. 6, pp. 966-985, Jun. 2013. (http://dx.doi.org/10.1016/j.infsof.2012.12.002) (Impact Factor: 1.522)

In-Gwon Song*, Sang-Uk Jeon, **Ah-Rim Han**, Doo-Hwan Bae, "An approach to identifying causes of implied scenarios using unenforceable orders", ***Information and Software Technology*** **(IST)**, Vol. 53, No. 6, pp. 666-681, Jun. 2011. (http://dx.doi.org/10.1016/j.infsof.2010.11.007) (Impact Factor: 1.522)

Ah-Rim Han*, Sang-Uk Jeon, Doo-Hwan Bae, Jang-Eui Hong, "Measuring behavioral dependency for improving change-proneness prediction in UML-based design models", ***Journal of Systems and Software*** **(JSS)**, Vol. 83, No. 2, pp. 222-234, Feb. 2010. (http://dx.doi.org/10.1016/j.jss.2009.09.038) (Impact Factor: 1.245)

CONFERENCE PAPERS

[International]

Kwangsik Song, **Ah-Rim Han***, Sehun Jeong, Sungdeok Cha, "Generating various contexts from permissions for testing Android applications", **SEKE 15**: Proceedings of 27^{th} International Conference on Software Engineering and Knowledge Engineering, pp. 87-92, Jul. 2015. (http://dx.doi.org/10.18293/SEKE2015-118)

Ah-Rim Han, Doo-Hwan Bae, "An efficient method for assessing the impact of refactoring candidates on maintainability based on matrix computation", **APSEC 14**: Proceedings of 21^{st} Asia-Pacific Software Engineering Conference, pp. 453-460, Dec. 2014. (27% acceptance ratio, 55/202) (http://dx.doi.org/10.1109/APSEC.2014.69)

Ah-Rim Han, Sang-Uk Jeon, Doo-Hwan Bae, Jang-Eui Hong, "Behavioral Dependency Measurement for Change-proneness Prediction in UML 2.0 Design Models", **COMPSAC 08**: Proceedings of 32^{nd} Annual IEEE International Computer Software and Applications, pp. 76-83, Jul. 2008. (19.5% acceptance ratio, 46/236) **(Selected by program committee for recommendation to Journal of Systems and Software (JSS))**

[**Domestic**]

Kwangsik Song, **Ah-Rim Han**, Sehun Jeong, Sungdeok Cha, "Permission-based Test Condition Generation in Android Application Development" (in Korean: "안드로이드 어플리케이션 개발에서 퍼미션 분석을 사용한 테스트 케이스의 다양한 테스트 환경 조건 생성 기법"), **KCSE 15**: Proceedings of 2015 Korea Conference on Software Engineering, Vol. 17, No. 1, pp. 289-290, Feb. 2015. [**best paper**]

Hyung-In Ihm, **Ah-Rim Han**, Sang-Uk Jeon, Doo-Hwan Bae, Jang-Eui Hong, "Instruction Pattern-Based Power Consumption Estimation for Embedded Software Design Models" (in Korean: "내장형 SW 개발 시 명령어패턴을 이용한 모델기반의 에너지 소모 예측 기법"), **KCSE 09**: Proceedings of 2009 Korea Conference on Software Engineering, Vol. 11, No. 1, pp. 122-129, Feb. 2009.

Hyung-In Ihm, In-Gwon Song, Sang-Uk Jeon, **Ah-Rim Han**, Jang-Eui Hong, Doo-Hwan Bae, "A Technique of Power Consumption Estimation for Embedded Software Design Models" (in Korean: "임베디드 소프트웨어 설계 모델의 추상화 수준에 따른 전력소모 예측 기법"), **KCSE 08**: Proceedings of 2008 Korea Conference on Software Engineering, Vol. 10, No. 1, pp. 113-120, Feb. 2008.

Ah-Rim Han, Dong-Won Kang, Hyeon-Jeong Kim, Doo-Hwan Bae, "An Approach to Extract Similar Process for Knowledge-Based Software Process Tailoring" (in Korean: "지식 기반의 소프트웨어 프로세스 테일러링을 위한 유사 프로세스 추출 기법"), **JWKSE 07**: Proceedings of 2007 Joint Workshop on Korea Software Engineering Technology, Vol. 5, No. 1, pp. 42-52, Aug. 2007.

Ah-Rim Han, Sang-Uk Jeon, Jang-Eui Hong, Doo-Hwan Bae, "Timing Consistency Checking in UML 2.0 Behavioral Models using OCL" (in Korean: "OCL을 이용한 UML 2.0 행위 모델의 시간 일관성 검사"), **KCC 06**: Proceedings of 2006 Korea Computer Congress, Vol. 33, No. 1, pp. 181-183, Jun. 2006.

PROFESSIONAL ACTIVITIES

Reviewers

2014, International Conference on Software Engineering (ICSE), Demonstrations track (External Reviewer)
2013, Expert Systems With Application (ESWA) (Invited from Editor)
2013, Information and Software Technology (IST) (Invited from Editor)
2013, The 29th IEEE International Conference on Software Maintenance (ICSM 2013)
2013, The 25th International Conference on Software Engineering and Knowledge Engineering (SEKE 2013)
2012, Journal of Systems and Software (JSS) (Invited from Editor)
2012, The 19th Asia Pacific Software Engineering Conference (APSEC)
2012, The 27th IEEE/ACM International Conference on Automated Software Engineering (ASE)
2012, International Conference on Advanced Software Engineering & Its Applications (ASEA 2012)
2010, The fourth IEEE International Conference on Secure Software Integration and Reliability Improvement (SSIRI)
2010, The 25th Symposium on Applied Computing (SAC)
2009, The 16th Asia Pacific Software Engineering Conference (APSEC)
2009, IEEE Software

Societies

2008 - Present, Member, Institute of Electrical and Electronics Engineers (IEEE)

2007 - Present, Member, Korea Institute of Information Scientists and Engineers (KIISE)

Miscellaneous
2007, Chair of the Ph.D students of Computer Science Department, KAIST, Daejeon, Korea

RESEARCH PROJECT EXPERIENCE

An approach to automating refactoring for making software evolvable
General Individual Research Program Nov. 2014 - Apr. 2017
National Research Foundation of Korea (NRF), Daejeon, Korea

An approach to automating software maintainability improvement
Post-Doctoral Training Program Nov. 2013 - Oct. 2014
National Research Foundation of Korea (NRF), Daejeon, Korea

Research on tools for highly assured SW development and high-level education for SW engineers
Information Technology Research Center (ITRC) Sep. 2013 - Dec. 2016
National IT Industry Promotion Agency (NIPA), Seoul, Korea

Software Process Improvement and Capability Analysis based on K-Model Jul. 2008 - Dec. 2008
National IT Industry Promotion Agency (NIPA), Seoul, Korea

- Develop metrics for analyzing improvement and capability of the software processes that are applied on the targeting companies.
- Provide guidelines for collecting data.
- Analyze the software process improvement and capability according to the characteristics of the projects, organizations, and companies.

Power Consumption Estimation Framework for UML-based Embedded Software Models Jan. 2007 - Oct. 2008
Software Engineering Laboratory, KAIST, Daejeon, Korea

- Develop the power consumption estimation technique that can be used at the early stage of software development.
- Estimate the power consumption for model elements (e.g., function, component, etc.) of UML-based embedded software models.
- Develop the visualizing method for the obtained results.

Process Tailoring Techniques for Defense Software Mar. 2006 - Feb. 2011
Agency for Defense Development (ADD), Daejeon, Korea

- Develop the methods for making process knowledge as assets and categorizing those process knowledge.
- Develop the methods for constructing and managing process knowledge repository.
- Develop the systematic method of process tailoring for automation.

Embedded Software Design and Verification Techniques for Multiprocessor System-on-Chip (MPSoC) Mar. 2005 - Jan. 2007
Ministry of Information and Communication, Seoul, Korea

- Develop the modeling methodology for embedded software.
- Develop the static analysis and behavior simulation techniques for embedded software models.
- Develop the partitioning technique of embedded software models.

- Develop the verification and functional simulation techniques for partitioned embedded software models.

REFERNCES

Doo-Hwan Bae
Professor, Head of Dept. of Computer Science at KAIST
Served as a Director of ITRC Software Process Improvement Center and the First President of Software Engineering Society
Dept. of Computer Science, KAIST,
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