Ah-Rim Han

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RESEARCH INTERESTS

I am a research professor in the Computer Science Department at Korea University. I have special interests in 1) **assessing and improving software design quality** and 2) **automating the software refactoring process**. My 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

- Lead the research projects for automating the refactoring identification process as a principle investigator
- Guide students to develop research subjects and conduct the experiments
- 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 Office of the Chief Information Officer

HONORS AND AWARDS

Best Paper Award, Software Engineering Society of Korean Institute of Information Scientists and Engineers (KIISE), Prize: $1,000, 2016
Best Paper Award, 2015 Korea Conference on Software Engineering, 2015
SAMSUNG Scholarship Program, SAMSUNG Electronics by Video Display Division, 2011 to 2012
Invitation to the Special Issue for Journal of Systems and Software, Top-quality papers of the IEEE International Conference on Computer Software and Ap-

plications, 2008
Korean Government Scholarship Program for Graduate Students, KAIST, 2005 to 2010
Magna Cum Laude, Bachelor of Science, Sogang University, 2004
Academic Excellence Scholarship, Sogang University, 2000 to 2002
Admission Excellence Scholarship, Sogang University, 2000

GRANTS

Individual Basic Science & Engineering Research Program, National Research Foundation of Korea (NRF), $125,000, sole PI, Nov. 2014 - Apr. 2017.
Post-Doctoral Fellowship Grant, National Research Foundation of Korea (NRF), $33,000, sole PI, Nov. 2013 - Oct. 2014.

JOURNAL PUBLICATIONS

Ah-Rim Han, Sungdeok Cha, "Two-phase Assessment Approach to Improve the Efficiency of Refactoring Identification", ***IEEE Transactions on Software Engineering*** **(TSE)**, Accepted, Online Published at July 25 2017.
(http://dx.doi.org/10.1109/TSE.2017.2731853) (Impact Factor: 3.272)

In-Gwon Song, **Ah-Rim Han**, Doo-Hwan Bae, "Efficient verification method to eliminate emergent behaviors of the scenario specifications", ***Information and Software Technology*** **(IST)**, Under Revision.

Kwangsik Song, **Ah-Rim Han**, Sehun Jeong, Sungdeok Cha, "Testing Android Applications considering various contexts inferred from permissions", *Journal of the Korean Institute of Information Scientists and Engineers: Software and Applications* **(KIISE)**, Vol. 42, No. 8, pp. 1021 - 1030, Aug. 2015. (**corresponding author**)
(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

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 Conference on Computer Software and Applications, pp. 76-83, Jul. 2008. (19.5% acceptance ratio, 46/236) **(Selected by program committee for recommendation to JSS)**

Referred to as Domestic Papers (Written in Korean)

Kwangsik Song, **Ah-Rim Han**, Sehun Jeong, Sungdeok Cha, "Permission-based Test Condition Generation in Android Application Development", **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", **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", **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", **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", **KCC 06**: Proceedings of 2006 Korea Computer Congress, Vol. 33, No. 1, pp. 181-183, Jun. 2006.

PROFESSIONAL ACTIVITIES

Committees

2015, Test of Certified Software Test Specialist (CSTS) organized by Telecommunications Technology Association (TTA)

Reviewers

2017, Journal of Systems and Software (JSS) (Invited from Editor)
2016, International Journal of Software Engineering and Knowledge Engineering (IJSEKE)
2015, The 37th International Conference on Software Engineering (ICSE), Demonstrations Track (ICSE 2015) (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 Evolvable Software
General Individual Research Program
National Research Foundation of Korea (NRF), Daejeon, Korea Nov. 2014 - Apr. 2017

Research on Automated Software Maintainability Improvement
Post-Doctoral Training Program
National Research Foundation of Korea (NRF), Daejeon, Korea Nov. 2013 - Oct. 2014

Research on Tools for Highly Assured SW Development and High-Level Education for SW Engineers
Information Technology Research Center (ITRC)
Ministry of Science, ICT and Future Planning, Korea Sep. 2013 - Dec. 2016

Software Process Improvement and Capability Analysis based on K-Model
National IT Industry Promotion Agency (NIPA), Seoul, Korea Jul. 2008 - Dec. 2008
- 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
KAIST, Daejeon, Korea Jan. 2007 - Oct. 2008
- 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
Agency for Defense Development (ADD), Daejeon, Korea Mar. 2006 - Feb. 2011

- 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)
Ministry of Information and Communication, Seoul, Korea Mar. 2005 - Jan. 2007

- 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
Served as a Director of ITRC Software Process Improvement Center and the First President of Software Engineering Society
Department of Computer Science, KAIST,
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