Ahrim **Han**

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Summary

I worked as a research professor in the Next-generation Game Research Center at the Computer Science Department at Korea University. My main research area has been Software Engineering, and I have been working on assessing and improving software design quality using statistical, data mining and automated software analysis techniques. From now on, I would like to work in companies as a data scientist for solving real-world problems. I have the special interest in finding business insights by leveraging big data intelligence.

Education

Korea Advanced Institute of Science and Technology (KAIST) *Daejon, South Korea*

Ph.D., Computer Science *Feb. 2007 - Aug. 2013*

Thesis: Identification and Selection of Refactorings for Improving Maintainability of Object-Oriented Software

Korea Advanced Institute of Science and Technology (KAIST) *Daejon, South Korea*

M.S., Computer Science *Sep. 2004 - Feb. 2007*

Thesis: Behavioral Dependency Measurement in UML 2.0 Sequence Diagrams for Change-proneness Prediction

Sogang University *Seoul, South Korea*

B.E., Computer Science (**Magna Cum Laude)** *Feb. 2000 - Feb. 2004*

Skills

Research Area: Software Engineering, Refactoring, Performance-Driven Architecture, Software Design, Software Quality Assessment, Software Quality Measurement, Software Defect Prediction, Maintainability Improvement, Data Analysis
Programming Languages and Tools: Java, Python, SQL, Markdown, Latex, C++, Fortran, R, SPSS, Eclipse, Microsoft Office
Modeling Languages: Unified Modeling Language, Specification and Description Language, System Dynamics
Machine Learning and Statistical Modeling Techniques: K-means Clustering Algorithm, Linear Regression, Logistic Regression, Decision Trees, Principal Component Analysis, Genetic Algorithm, Search and Optimization
Language: English and Korean

Work Experience

Korea University *Seoul, South Korea*

Position: Research Professor *Sep. 2013 - Apr. 2018*

- Led the research projects for automating the refactoring identification process as a sole Principal Investigator
- Advised graduate students to develop research topics and conduct the experiments
- Published the research results to the top tier Software Engineering journal, IEEE Transactions on Software Engineering

[Research Project]

Efficient refactoring candidate identification *Mar. 2008 - Apr. 2017*

Provided the several new methods to improve the efficiency of the refactoring identification process
- Dynamic profiling-based refactoring identification: Used the dynamic profiling technique for finding the candidates in classes where real changes have occurred
- Multiple and independent refactoring identification: Used the concept of maximal independent set to select multiple refactorings having no dependencies each other and can be applied simultaneously
- Two-phased search-based refactoring identification: To reduce the search space of candidates to be examined, the refactoring candidates that are more likely to improve maintainability are selected, then only the chosen refactoring candidates are evaluated using a more precise fitness function

Korea Advanced Institute of Science and Technology (KAIST) *Daejeon, South Korea*

Position: Research Assistant & Teaching Assistant *Mar. 2005 - Aug. 2013*

- Played an active role in setting up assignments and taught a few classes for several computer science subjects, “Introduction to Programming”, “Advanced Software Engineering”, “Computer Science Project”, and “Principles of Software Engineering”
- Developed the tool for automated refactoring identification with Java and Python

[Research Projects]

Fast refactoring candidate assessment metric *Mar. 2011 - Dec. 2014*

Developed a fast refactoring candidate assessment metric, Delta Table, that is calculated based on matrix computation

Improvement of change-proneness prediction *Mar. 2006 - Feb. 2009*

Developed the new behavioral dependency metrics that capture the dynamic aspects of the program and proposed a more accurate change-proneness prediction model using these metrics in conjunction with existing structural metrics

Peace Corps (Headquarters) *Washington D.C., USA*

Position: Intern *Aug. 2004 - Oct. 2004*

Served in organizing and populating the intranet web pages in the Technical Infrastructure and Support Team under the Office of the Chief Information Officer (Funded by Human Resources Development Service of Korea)

Zio Interactive (acquired by Neowiz Mobile) *Seoul, South Korea*

Position: Software Developer Intern *Feb. 2004 - Apr. 2004*

Worked in the mobile game company and contributed solely to porting an existing soccer game to a new game development environment (SDK from Qualcomm BREW (KT) to SK-VM (SKT))

Honors and Awards

2014 - 2017 **Basic Research Grant,** Funded by National Research Foundation of Korea (NRF), **sole Principal Investigator**, **$125,000**

2016 **Best Paper Award,** Software Engineering Society of Korean Institute of Information Scientists and Engineers (KIISE), Prize: **$1,000**

2015 **Best Paper Award,** 2015 Korea Conference on Software Engineering

2013 - 2014 **Post-Doctoral Fellowship Grant,** Funded by National Research Foundation of Korea (NRF), **sole Principal Investigator**, **$30,000**

2011-2012 **SAMSUNG Scholarship Program,** SAMSUNG Electronics by Video Display Division

2008 **Invitation to the Special Issue for Journal of Systems and Software,** Top-quality papers of the IEEE International Conference on Computer Software and Applications

2005-2010 **Korean Government Scholarship Program for Graduate Students,** KAIST

2004 **Magna Cum Laude,** Bachelor of Science, Sogang University

Publications

Two-phase Assessment Approach to Improve the Efficiency of Refactoring Identification

Ah-Rim Han, Sungdeok Cha

IEEE Transactions on Software Engineering (TSE), Online Published on July 25, 2017. (Impact Factor: 3.272)

An efficient approach to identify multiple and independent Move Method refactoring candidates

Ah-Rim Han, Doo-Hwan Bae, Sungdeok Cha

Information and Software Technology (IST), Vol. 59, pp. 53-66, Mar. 2015. (Impact Factor: 1.522)

Generating various contexts from permissions for testing Android applications

Kwangsik Song, **Ah-Rim Han**, Sehun Jeong, Sungdeok Cha

Proc. of 27^{th} International Conference on Software Engineering and Knowledge Engineering, pp. 87-92, Jul. 2015.

An efficient method for assessing the impact of refactoring candidates on maintainability based on matrix computation

Ah-Rim Han, Doo-Hwan Bae

Proc. of 21^{st} Asia-Pacific Software Engineering Conference, pp. 453-460, Dec. 2014.

Dynamic profiling-based approach to identifying cost-effective refactorings

Ah-Rim Han, Doo-Hwan Bae

Information and Software Technology (IST), Vol. 55, No. 6, pp. 966-985, Jun. 2013. (Impact Factor: 1.522)

An approach to identifying causes of implied scenarios using unenforceable orders

In-Gwon Song, Sang-Uk Jeon, **Ah-Rim Han**, Doo-Hwan Bae

Information and Software Technology (IST), Vol. 53, No. 6, pp. 666-681, Jun. 2011. (Impact Factor: 1.522)

Measuring behavioral dependency for improving change-proneness prediction in UML-based design models

Ah-Rim Han, Sang-Uk Jeon, Doo-Hwan Bae, Jang-Eui Hong

Journal of Systems and Software (JSS), Vol. 83, No. 2, pp. 222-234, Feb. 2010. (Impact Factor: 1.245)

Behavioral Dependency Measurement for Change-proneness Prediction in UML 2.0 Design Models

Ah-Rim Han, Sang-Uk Jeon, Doo-Hwan Bae, Jang-Eui Hong

Proc. of 32^{nd} Annual IEEE International Conference on Computer Software and Applications, pp. 76-83, Jul. 2008.

Professional Activities

Reviewers Journal of Systems and Software, Expert Systems With Application, Information and Software Technology, IEEE Software

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