

GIGON BAE

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Professional Experience

Senior Camera Software Engineer, NVIDIA Corporation, Santa Clara, CA, USA Oct. 2016 – present

- Designing and developing camera Hardware Abstraction Layer (HAL) in Android framework and Linux.
- Driving complex technical issues to closure that may occur in cross-team boundary.
- Defining and documenting camera software API.
- Utilizing programming primitives, data structures, multi-threading and memory management techniques.
- Using camera/imaging/video systems within the Tegra camera software team.
- Designing and developing camera sensor testing and test monitoring framework.

Senior Camera Software Engineer, NVIDIA Korea, Seoul, South Korea Aug. 2015 – Sep. 2016

Designed and developed features (such as Depth API) of camera Hardware Abstraction Layer (HAL) in Android framework and Linux. Drove complex technical issues to closure that occurred in cross-team boundary. Set continuous testing up with Jenkins to test build images with various camera sensor configurations. Implemented scripts using Bash/Python to automate camera sensor testing.

Part-time Researcher and Software Engineer, Information-based Design Research Group, Department of Culture Technology, KAIST, Daejeon, South Korea Feb. 2008 – Mar. 2011

Ported SEED-Layout, an application developed within the School of Architecture at Carnegie Mellon University, to pure Java with the Swing framework. Rewrote SEED-Layout's core components that were coded using the ET++ framework (an old application framework written in C++) more than 10 years ago, enabling students in the research group to develop new techniques.

Part-time Software Engineer, Medianix Inc., Daejeon, South Korea Jan. 2008 – Sep. 2009

Maintained an automatic license plate recognition system (ALPRS). Upgraded a DB manager (a Python script based client application) by changing the schema of MySQL DB tables as well as the update policy, reducing DB update time by more than 30%. Upgraded the main GUI of the system built with MFC by Visual C++. Improved the performance of the image-processing algorithm by 15% by C++ code refactoring and rewriting. Increased average license plate match accuracy by 5% by applying a machine learning technique (support vector machine).

Intern, Nexon Co., Ltd, Seoul, South Korea Jan. 2006 – Feb. 2006

- **Nexon**, a global game company, offered an internship opportunity to the top four teams from the A.I. programming competition in the fourth KAIST & POSTECH Science War.
- Developed a network game framework (implemented in C++, using DirectX) with a user manual to support the creation of battle games for the next A.I programming competitions.

Intern, Medianix Inc., Daejeon, South Korea Jul. 2005 – Aug. 2005

Analyzed the (Visual C++ based) source code of TeleLog 2000, a large system recording voice from telephone lines for fire departments, to draw up a commentary paper describing the architecture of TeleLog 2000.

Skills

Programming Software	Java, C/C++, Python, JavaScript, Bash, R, MATLAB, HTML, MySQL (working knowledge) Eclipse, Visual Studio, IntelliJ IDEA, RStudio, Cobertura, Selenium/Webdriver, Lava (Platform LSF), Jenkins, Sublime Text, Subversion, CVS, Git
Languages	Korean (native) and English

Education

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

M.S. & Ph.D. Combined Program in Computer Science Mar. 2006 – Aug. 2014

- Advisors: **Doo-Hwan Bae**, **Gregg Rothermel** (co-advisors), Yong Rae Kwon
- Lab: **KAIST Software Engineering Lab**
- Dissertation: *A Plugin-Based Framework for Supporting GUI Application Testing*

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

B.S. in Computer Science Mar. 2002 – Feb. 2006

Research Interests

Broadly: software engineering. Specifically: GUI testing (2010–present); automated test generation (2010–present); code clone detection (2008–2010); memory leak detection (2006–2009).

Research Experience

- Postdoctoral Researcher**, **ESQuaRed Lab**, University of Nebraska-Lincoln, Lincoln, NE, USA Oct. 2014 – April, 2015
- Supervisor: Gregg Rothermel.
 - Designed and implemented a **web automation framework** with easy-to-use Java APIs that enables testers and researchers to extract/manipulate events from Web Browser, to maintain/verify GUI states, and to implement automated test case generation algorithms. Built the framework on top of Selenium/WebDriver library.
- Research Assistant**, Software Engineering Lab, KAIST, Daejeon, South Korea 2006 – 2014
- Developing a GUI testing framework and automated test case generation techniques*** Mar. 2010 – Aug. 2014
- Developed a **flexible GUI testing framework** for Swing-based Java applications. Researched automated GUI test case generation techniques.
- Process tailoring of defense software***, funded by Agency for Defense Development Jan. 2010 – Aug. 2014
- Researched techniques to allocate human resources and to estimate effort for software development projects. Developed a software development effort estimation module in Java. This module will be integrated into a commercially built project schedule management system.
- Scheduling clone-based refactoring using a competent GA*** Jan. 2008 – Feb. 2010
- Developed an **Eclipse plugin** that exploits Eclipse Java development tools (JDT) and an evolutionary algorithm to automatically detect code clones that are suitable for refactoring and to generate the most beneficial refactoring schedule to remove them.
- Preventing and detecting errors in embedded systems***, funded by SureSoft Tech. Inc. Nov. 2007 – Oct. 2009
- Developed a memory leak detection technique in Java, using offline instrumentation of Java Foundation Classes (JFC).
- Improving and integrating test guidelines***, funded by Samsung Electronics Aug. 2007 – Feb. 2008
- Researched state-of-art testing techniques/tools and updated test guideline documents used for software engineers in *Samsung Electronics*.
- Detecting memory errors in mobile software***, funded by SureSoft Tech. Inc. May. 2006 – Mar. 2007
- Developed a memory leak detection module in C using code instrumentation and a memory reference counting technique.

Teaching

- Teaching Assistant**, Korean National Information Society Agency (NIA) Jan. 2010 – May. 2010
- Mentored South Korea's two representatives participating in Intel International Science and Engineering Fair (ISEF) 2010 in the computer science category.
- Teaching Assistant**, Department of Computer Science, KAIST, Daejeon, South Korea
- CS202 Problem Solving (undergraduate)*** 2008 – 2010
- Spring 2008, Fall 2008, Spring 2009, Fall 2009, and Fall 2010.
 - Guided CS202 course which provides undergraduate students with experience solving problems with algorithms. Students are given problems that are likely to be found in the ACM International Collegiate Programming Contest (ICPC). An A.I. programming competition is held as the final project (examination).
 - Graded homework assignments that require developing algorithms for given problems.
 - Established a tetris network game server and client skeleton using DirectX for the A.I. programming competition. Documents for the final project and videos are available at <http://gigony.tistory.com/51> and <http://www.youtube.com/watch?v=wSX9cenCRDQ>
- CS101 Introduction to Programming (undergraduate)*** 2007
- Spring 2007 and Fall 2007.
- CC510 Introduction to Computer System and Applications (graduate)*** 2006
- Spring 2006.
- Teaching Assistant**, Software Expert Program, KAIST, Daejeon, South Korea
- SEP524 Software Quality Assurance (graduate)*** 2006 – 2007, 2010
- Fall 2006, Fall 2007, and Fall 2010.

Honors and Awards

- National Scholarship for Graduate School Education (South Korea)** 2006 – 2014
First prize in A.I. programming competition in the fourth KAIST & POSTECH Science War, sponsored by *Nexon*, team project (each team had two members) Sep. 2005
- http://vok.kaist.ac.kr/vok_etcvideo/14694 (04:26~05:35)
 - My colleague and I contributed equally to the work.
- Samsung Software Membership** (Undergraduate Research Scholarship) 2003 – 2006
Merit-based Scholarship from Korea Advanced Institute of Science and Technology (KAIST) 2002 – 2006

Professional Service

- ACM Transactions on Software Engineering and Methodology (TOSEM) Reviewer, 2017.
IEEE Annual International Computers, Software & Applications (COMPSAC) Subreviewer, 2013.
IEEE Transactions on Software Engineering (TSE) Subreviewer, 2012.
ACM/IEEE International Conference on Software Engineering (ICSE) Subreviewer, 2012.
IEEE Annual International Computers, Software & Applications (COMPSAC) Subreviewer, 2010.
Asia Pacific Software Engineering Conference (APSEC) Subreviewer, 2010.
International Conference on Quality Software (QSIC) Subreviewer, 2010.

Community Service

- Samsung Software Membership** (www.secmem.org), supported by *Samsung Electronics* 2003 – 2006
Initiated or participated in experimental projects, such as ‘Developing A.I. module based on a decision-tree-based pattern clustering algorithm for Tetris game’ and ‘SoriLotte: a Caller ID (CID) based cell phone alarm service’ while housed in a Samsung Software Membership branch office at Daejeon, South Korea. Developed major algorithmic modules in the projects and exchanged IT technologies with other students.
- Korea IT Volunteers**, Jahangirnagar University, Dhaka, Bangladesh Jan. 2004 – Feb. 2004
- Offered basic computer training for professors at Jahangirnagar University with support from Korean National Information Society Agency (NIA). Worked with a team of four as an IT specialist for the team, teaching how to install and operate Linux and promoting a cultural exchange between the two countries.
 - Counseled Jahangirnagar University in constructing the network infrastructure, such as routers and internet proxy servers, to maximize the utilization of a low-bandwidth connection.

Publications

- [ESEJ] Mouna Hammoudi, Ali Alakeel, Brian Burg, **Gigon Bae**, Gregg Rothermel, “Facilitating Debugging of Web Applications Through Recording Reduction: A Family of Empirical Studies,” to be published in the Empirical Software Engineering journal, 2017 (DOI: 10.1007/s10664-017-9519-z).
- [FSE’15] Mouna Hammoudi, Brian Burg, **Gigon Bae**, Gregg Rothermel, “On the Use of Delta Debugging to Reduce Recordings and Facilitate Debugging of Web Applications,” in Proceedings of the 2015 10th Joint Meeting on Foundations of Software Engineering, pp. 333–344, 2015.
- [JSS] **Gigon Bae**, Gregg Rothermel, and Doo-Hwan Bae, “Comparing Model-based and Dynamic Event-extraction Based GUI Testing Techniques: An Empirical Study,” Journal of Systems and Software, vol. 97, pp. 15–46, Nov. 2014.
- [KCSE’14] Jihun Park, Donghwan Shin, Gwangui Hong, Dongwon Seo, Jimin Hwa, **Gigon Bae**, Yeoung-Seok Seo, Doo-Hwan Bae, “실무 요구사항을 고려한 소프트웨어 프로젝트 계획 생성 지원 기법 및 도구,” in Proceedings of Korea Conference on Software Engineering 2014 – KCSE 2014, vol. 16, no. 1. pp. 66–67, Feb., 2014.
- [JSES] Jihun Park, Donghwan Shin, Gwangui Hong, Dongwon Seo, Jimin Hwa, **Gigon Bae**, Yeoung-Seok Seo, Doo-Hwan Bae, “Automatic Project Planning Technique and Tool Based on Software Industry Requirements,” Journal of Software Engineering Society, vol. 26, no. 4, pp. 77–92, Dec. 2013.
- [KISS] Jimin Hwa, Jihun Park, Donghwan Shin, Gwangui Hong, **Gigon Bae**, Yeoung-Seok Seo, Doo-Hwan Bae, “Automated Human Resource Allocation based on Practical Feedback from Software Industry,” Journal of the Korean Information Science Society(B): Software and Applications, vol. 40, no. 7, pp. 369–380, Jul. 2013.
- [KCSE’13] Jimin Hwa, Jihun Park, Donghwan Shin, Gwangui Hong, **Gigon Bae**, Yeoung-Seok Seo, Doo-Hwan Bae, “An Approach to Automated Human Resource allocation including Practical Issues in Software Projects,” in Proceedings of Korea Conference on Software Engineering 2013 – KCSE 2013, vol. 34, no. 1. pp. 111–112, Jan., 2013. Won best paper

award at the conference. (Originally submitted a 10-page paper and then invited to “Journal of the Korean Information Science Society”.)

[ISSRE’12] Gigon Bae, Gregg Rothermel, and Doo-Hwan Bae, “On the relative strengths of model-based and dynamic event extraction-based GUI testing techniques: An empirical study,” in Proceedings of the International Symposium on Software Reliability Engineering, pp. 181–190, Nov. 2012.

[SPE] Sukhee Lee, Gigon Bae, Heung Seok Chae, Doo-Hwan Bae, and Yong Rae Kwon, “Automated scheduling for clone-based refactoring using a competent GA,” *Software: Practice and Experience*, vol. 41, no. 5, pp. 521–550, Apr. 2011.

[KCC’07] Gigon Bae, Sukhee Lee, and Yong Rae Kwon, “Memory Leak Detection in C,” in Proceedings of Korea Computer Congress 2007 – KCC 2007, vol. 34, no. 1, pp. 510–515, Jun. 2007.