

JUNGHEE LIM

CURRICULUM VITAE

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RESEARCH INTERESTS

- Computer Security
- Program-Analysis Problems
- Model Checking
- Code Instrumentation
- Finding Bugs and Security Vulnerabilities
- Binary (Machine-Code) Analysis
- Static & Dynamic Analysis
- Compiler Optimization

EDUCATION

- 2006–2011 **Ph.D in Computer Sciences, May 2011** Advisor: Prof. Thomas Reps
Computer Sciences Department, University of Wisconsin-Madison, WI, USA
Dissertation: “*TSL: A System for Creating Program Analyzers and its Applications*”
- 2004–2006 **M.S. in Computer Sciences, Dec. 2006** Advisor: Prof. Thomas Reps
Computer Sciences Department, University of Wisconsin-Madison, WI, USA
- 1999–2003 **B.S. in Comp. Sci. and Eng., Jun 2003** Advisor: Prof. Jaejin Lee
Seoul National University, South Korea

HONORS AND AWARDS

- Outstanding Graduate Research Award (UW Computer Sciences Department) 2011
- EAPLS Best Paper Award (with T. Reps) ETAPS 2008
European Association for Programming Languages and Systems <http://www.eapls.org>
- Symantec Research Labs Graduate Fellowship 2008–2009
<http://www.symantec.com/about/careers/college/fellowship.jsp>
- University of Wisconsin-Madison Research Assistantship 2004–2011
- Korea National IT Industry Promotion Agency Fellowship 2002–2004
- Seoul National University Research Assistantship 2003–2004
- Seoul National University Merit-Based Scholarship 1999–2003

RESEARCH EXPERIENCES

- Jun 2011–
present **Research Associate** Advisor: Prof. Thomas Reps
Computer Sciences Department, University of Wisconsin-Madison, WI, USA
 My research involves in the *Policy Weaving* project focusing on enforcing safety properties of computer programs. The *Policy Weaving* project is supported by DARPA's Clean-slate Resilient Adaptive Secure Hosts (CRASH) Program.
- 2006–2011 **Research Assistant** Advisor: Prof. Thomas Reps
Computer Sciences Department, University of Wisconsin-Madison, WI, USA
 My research work involves in the development of the TSL (Transformer Specification Language) system, and its applications on machine-code verification and debugging. The TSL system is a tool-generator to help in the creation of tools for analyzing machine code. Using the TSL system, we have developed a model-checking tool, called MCVETO, for machine-code program.
- Feb. 2009–
Apr. 2009 **Research Intern** Supervisor: Prof. Tzi-cker Chiueh
Symantec Research Laboratory, Symantec Inc., CA, USA
 Developed a tool, called BCE (**B**otnet **C**ommand **E**xtractor), that analyzes botnet zombies to recover information about the commands that they respond to.
- 2004–2006 **Research Assistant, Wisconsin Safety Analyzer (WiSA) project**
Computer Sciences Department, University of Wisconsin-Madison, WI, USA
 The WiSA project focuses on the use of static analysis to detect vulnerabilities in possibly malicious programs. My research work concerned CodeSurfer/x86, which is a prototype system that provides a framework for investigating the properties and behaviors of x86 executables. Advisor: Prof. Thomas Reps
- Aug. 2003–
Jul. 2004 **Research Assistant, Advanced Compiler Laboratory** Advisor: Prof. Jaejin Lee
Seoul National University, South Korea
 SNACK (Seoul National University Advanced Compiler Tool Kit) is a research project involved with the development of a series of advanced compilers for embedded systems. My research work involved the development of the postpass optimizer for ARM processors called *STACK-pop*.

PUBLICATIONS

Digital copies can be downloaded from <http://www.cs.wisc.edu/~junghee/>

Thesis

- Junghee Lim, *Transformer Specification Language: A System For Creating Analyzers and its Applications*, Ph.D. Dissertation, Computer Sciences Department, University of Wisconsin, Madison, WI, May 2011 (**Won the UW Computer Sciences Department's Outstanding Graduate Student Research Award for 2011**).

PUBLICATIONS (Cont.)

Journal Publications

- W. Zhang, C. Sun, J. Lim, S. Lu, and T. Reps. *ConMem: Detecting Crash-Triggering Concurrency Bugs through an Effect-Oriented Approach*. To appear on TOSEM.
- Junghee Lim, Akash Lal, and Thomas Reps. *Symbolic Analysis via Semantic Reinterpretation*. In *Int. Journal on Software Tools for Technology Transfer* 13 (STTT), 1 (2011), 61-87.

Conference Publications

- Elder, M., Lim, J., Sharma, T., Andersen, T., and Reps, T. *Symbolic Analysis via Semantic Reinterpretation*. To appear in Proceedings of 18th International Static Analysis Symposium (SAS), Venice, Italy, 2011.
- Zhang, W., Lim, J., Olichandran, R., Scherpelz, J., Jin, G., Lu, S., and Reps, T. *ConSeq: Detecting Concurrency Bugs through Sequential Errors*. In Proceedings of Architectural Support for Programming Language and Operating Systems (ASPLOS), New Port Beach, California, 2011.
ASPLOS'11 acceptance rate: 21% (32/152).
- A. Thakur, J. Lim, A. Lal, A. Burton, E. Driscoll, M. Elder, T. Andersen, and T. Reps. *Directed Proof Generation for Machine Code*. In Proceedings of Computer-Aided Verification (CAV), Edinburgh, Scotland, 2010.
CAV'10 acceptance rate: 35% (51/145).
- Junghee Lim, Akash Lal, and Thomas Reps. *Symbolic Analysis via Semantic Reinterpretation*. In *Proceedings of the SPIN Workshop of Model Checking of Software*, Grenoble, France, 2009.
SPIN'09 acceptance rate: 44% (18/41).
- Junghee Lim and Thomas Reps. *A System for Generating Static Analyzers for Machine Instructions*. In Proceedings of the International Conference on Compiler Construction (CC), Budapest, Hungary, 2008.
CC'08 acceptance rate: 25% (18/71).
(Won the EAPLS Best Paper Award at ETAPS 2008.)
- Junghee Lim, Thomas Reps, and Ben Liblit. *Extracting File Formats from Executables*. In Proceedings of the 13th Working Conference on Reverse Engineering (WCRE), Benevento, Italy, 2006.
WCRE'06 acceptance rate: 29% (24/84).
- Akash Lal, Junghee Lim, Marina Polishchuk, and Ben Liblit. *Path Optimization in Programs and its Application to Debugging*. In Proceedings of European Symposium on Programming (ESOP), Vienna, Austria, 2006.
ESOP'06 acceptance rate: 24% (21/87).

PUBLICATIONS (Cont.)

Conference Publications

- Balakrishnan, G., Reps, T., Kidd, N., Lal, A., Lim, J., Melski, D., Yong, S., Chen, C.-H., and Teitelbaum, T. *Model checking x86 executables with CodeSurfer/86 and WPDS++*. In Proceedings of Computer Aided Verification (CAV), Edinburgh, Scotland.
CAV'05 acceptance rate: 26% (32/125).
- Chanik Park, Junghee Lim, Kiwon Kwon, Jaejin Lee, and Sang Lyul Min. *Compiler Assisted Demand Paging for Embedded Systems with Flash Memory*. In Proceedings of the 4th International Conference on Embedded Software (EMSOFT), Pisa, Italy, 2005.
EMSOFT'04 acceptance rate: 36% (31/87).

Invited Papers

- Reps, T., Lim, J., Thakur, A., Balakrishnan, G. and Lal, A. *There's plenty of room at the bottom: Analyzing and verifying machine code*. In Proc. Computer Aided Verification (CAV), Edinburgh, Scotland, 2010.
- Reps, T., Balakrishnan, G., and Lim, J. *Intermediate-representation recovery from low-level code*. In Workshop on Partial Evaluation and Program Manipulation (PEPM), Charleston, SC, 2006.
- Reps, T., Balakrishnan, G., and Lim, J. *A next-generation platform for analyzing executables*. In the 3rd Asian Symposium on Programming Language and Systems (APLAS), Tsukuba, Japan, 2005.

Reprinted in Collections

- Reps, T., Balakrishnan, G., Lim, J., and Teitelbaum, T., *A Next-Generation Platform for Analyzing Executables*. In *Malware Detection*, Advances in Information Security series, Springer-Verlag, 2006, pp. 43-61.

Other Publications and Reports

- Junghee Lim and Thomas Reps. *BCE: Extracting Botnet Commands from Bot Executables*. Tech Report TR-I668, Computer Science Department, University of Wisconsin-Madison, February 2010.
- Junghee Lim and Thomas Reps. *A System for Generating Static Analyzers for Machine Instructions*. Tech Report TR-1622r, Computer Science Department, University of Wisconsin-Madison, October 2007.

PUBLICATIONS (Cont.)

Other Publications and Reports

- Akash Lal, Junghee Lim and Marina Polishchuk, and Ben Liblit. *BTrace: Path Optimization for Debugging*. Tech Report TR-1535, Computer Science Department, University of Wisconsin-Madison, October 2005.
- Balakrishnan, G., Reps, T., Kidd, N., Lal, A., Lim, J., Melski, D., Yong, S., Chen, C.-H., and Teitelbaum, T. *Model checking x86 executables with CodeSurfer/86 and WPDS++*. In Workshop on Evaluation of Software Defect Detection Tools, Chicago, IL, June 2005

TECHNICAL PRESENTATIONS

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| Feb. 2012 | Analysis of Executables: Benefits and Challenges - Dagstuhl Seminar 12051
<i>TSL: A System for Automatically Creating Analyzers and its Applications</i> | Wadern,
Germany |
| Oct. 2011 | DARPA Crash site-visit
<i>McWeave: Machine-Code Policy Weaving</i> | Madison, WI, USA |
| Apr. 2011 | Dissertation
<i>TSL: A System for Automatically Creating Analyzers and its Applications</i> | Computer Sciences Dept., University of Wisconsin
Madison, WI, USA |
| Aug. 2010 | Comp. Sci. & Eng. Dept., Seoul National University
<i>TSL: A System for Automatically Creating Analyzers and its Applications</i> | Seoul, South Korea |
| Jun. 2009 | SPIN Workshop of Model Checking of Software
<i>Symbolic Analysis via Semantic Reinterpretation</i> | Grenoble, France |
| Apr. 2009 | Symantec Research Laboratory
<i>The TSL System and its Application on Botnet-Command Extraction</i> | Culver City, CA, USA |
| Feb. 2009 | Symantec Research Laboratory
<i>A System for Generating Static Analyzers for Machine Instructions</i> | Culver City, CA, USA |
| Apr. 2008 | Conference on Compiler Construction (CC)
<i>A System for Generating Static Analyzers for Machine Instructions</i> | Budapest, Hungary |
| Nov. 2007 | LIAFA, Université Paris Diderot - Paris 7
<i>A System for Generating Static Analyzers for Machine Instructions</i> | Paris, France |
| Oct. 2006 | Working Conference on Reverse Engineering (WCRE)
<i>Extracting File Formats from Executables</i> | Benevento, Italy |
| Jan. 2006 | Seoul National University
<i>Analyzing Memory Accesses in x86 Executables</i> | Seoul, South Korea |

OTHER ACADEMIC ACHIEVEMENTS AND ACTIVITIES

- Travel Grant Award from Google for ASPLOS'12 March, 2012
- SAT/SMT Solver Summer School June 12-17, 2011
The goal is to connect SAT/SMT developers and power users. MIT, Cambridge, MA
- CRW-A Travel Grant June 4-5, 2011
Career Mentoring Workshop for Junior Academic/Industrial Researchers San Jose, CA
- Travel Grant from CRA-W/CDC Mar. 2011
Workshop on Multicore Systems – Architectures, Runtime Systems and Software Development
Newport Beach, CA
- Student Travel Grant from ASPLOS'11 Mar. 2011
16th International Conference on Architectural Support for Programming Languages and Operating
Systems Newport Beach, CA
- Student Travel Grant from FLoC'10 July 2010
Federated Logic Conference Edinburgh, Scotland
- Volunteer at FLoC'10 in Edinburgh July 2010

PROFESSIONAL ACTIVITIES

- Reviewer (as an external referee) for Computer and Communications Security (CCS) 2010.
- Reviewer (as an external referee) for Computer Aided Verification (CAV) 2006.

WORK EXPERIENCES

- Jan.2001–Aug.2002, part-time Software Engineer (Application Programming), Cellvic Co.

TECHNICAL SKILLS

Computer Languages	C/C++, Java, OCAML, Scheme, PHP, Python, Perl, Assembly Languages (IA32, PPC32, ARM, etc.).
Operating Systems	Windows, Unix, Linux, MacOS

PERSONAL INFORMATION

- US Visa Status: US Green Card Holder
- Country of Citizenship: South Korea
- Language Proficiency: Korean, English

REFERENCES

Available upon request.