

# JUNGHEE LIM

## CURRICULUM VITAE

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### 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*

### RESEARCH EXPERIENCES

- Jun 2011–  
present **Research Associate** Supervisor: Prof. Thomas Reps  
*Computer Sciences Department, University of Wisconsin-Madison, WI, USA*  
My research involves in the DARPA *BET* (**B**inary **E**xecutable **T**ransforms) project focusing on binary executable program analysis, particularly (i) identifying program functional components, (ii) extracting them, and (iii) verifying extracted component properties.
- 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 developed various model-checking tools, including 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.

**RESEARCH EXPERIENCES (Cont.)**

- 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–    **Research Assistant, Advanced Compiler Laboratory**            Advisor: Prof. Jaejin Lee  
 Jul. 2004    *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**).

## Journal Publications

- Junghee Lim and Thomas Reps. *TSL: A System for Generating Abstract Interpreters and its Applications to Machine-Code Analysis*. Submitted for journal publication, October 2012.
- 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).

**PUBLICATIONS (Cont.)**

## Conference Publications (Cont.)

- 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), pages 270279, 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).
- 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.

**PUBLICATIONS (Cont.)**

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-1668, 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.
- 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

**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

**TECHNICAL SKILLS**

Computer Languages	C/C++, Java, OCAML, Scheme, Python, Perl, Assembly Languages (IA32, PPC32, ARM, etc.).
Theorem Provers	Yices, Z3
Tools	LLVM, PIN, CodeSurfer
Operating Systems	Windows, Unix, Linux, MacOS

**TECHNICAL PRESENTATIONS**

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

**PERSONAL INFORMATION**

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

**REFERENCES**

Available upon request.