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## Yonghee Shin

1117-1B Crab Orchard Drive, Raleigh, NC, 27606, 919.946.0781  
yonghee.shin@ncsu.edu  
<http://www4.ncsu.edu/~yshin2/>

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### QUALIFICATION SUMMARY

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- Strong background on software reliability, software metrics, fault prediction, and automated software testing
  - Extensive experience in Java, database, and web programming
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### EDUCATION

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*North Carolina State University, Raleigh, NC*  
**Ph.D. Student in Computer Science** **Expected Fall 2009**  
Topic: Predicting vulnerabilities using software metrics  
Advisor: Dr. Laurie Williams  
GPA 4.0

*Texas A&M State University, College Station, TX*  
**M.S. in Computer Science** **2003**  
GPA 3.69

*Sookmyung Women's University, Seoul, Korea*  
**B.S. in Computer Science** **1992**  
GPA Major 3.78, Overall 3.66

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### ACADEMIC EXPERIENCE

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#### Research Interests

Software reliability engineering, Fault prediction, Vulnerability prediction, Automated software (security) testing

*North Carolina State University, Raleigh, NC*

#### Research Assistant (Advisor: Dr. Laurie Williams) **Spring 2006 - Present**

- Investigating models and metrics to predict vulnerabilities in source code using internal and external metrics obtained from source code repository and failure databases. Performed a case study on Mozilla open source code to build a model using statistical analysis. Future work includes various modeling on industrial projects using statistical analysis and machine learning.
- Performed research on automated security testing and created a tool for generating test cases to detect SQL injection vulnerabilities using static and dynamic analysis.

*North Carolina State University, Raleigh, NC*

#### Teaching Assistant **Fall 2004 – Fall 2005**

- Programming Concepts – Java (Fall 2004)
- Introduction to Software Testing (Spring 2005)
- String Processing Languages (Perl) (Spring 2005)
- Software Testing and Reliability (Fall 2005)

Assisted in grading, lab sections, projects and assignments design.

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## INDUSTRIAL EXPERIENCE

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*AT&T Labs, Inc., Florham Park, NJ*

**Research Intern**

**Summer 2008**

- Conducted research on fault prediction using calling structure information and showed the usefulness of using calling structure information in fault prediction. Mentored by Dr. Elaine Weyuker, Dr. Thomas Ostrand, and Dr. Robert Bell.

*ABB, Inc., Raliegh, NC*

**Research Intern**

**Summer 2005**

- Conducted research on prioritizing process improvement area in Capability Maturity Model Integration (CMMI) to reduce defect rate using Analytic Hierarchy Process. Developed a web application for the prioritization. Mentored by Dr. Aldo Dagnino.

*Samsung SDS Co., Ltd., Seoul, Korea,*

**Software Engineer**

**1996-2000**

- *Developed web sites for companies* - Analyzed user requirements, coordinated web designers and developers, and implemented web pages. E.g. Samsung Card Ltd., a credit card company in Korea.
- *Developed authoring tools and browsers for video and data service* - Developed authoring tools and browsers for video-on-demand service on TCP/IP and ATM network, and for data broadcast service on digital TV. Mainly covered the network library design and implementation, and video server management. Assisted some GUI programming.

*Software Research Center, Daewoo Telecom Co., Ltd., Seoul, Korea*

**Software Engineer**

**1992-1996**

- *Developed a database management system* - Customized and tested the storage management layer of a multi-user database management system with the functionality of indexes, concurrency control, and recovery control. Implemented administrator's tools for the DBMS.

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## TECHNICAL SKILLS

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- Languages: Java, C, SQL, JSP, JavaScript, HTML, XML, Perl, Shell scripts
- OS: MS-Windows, UNIX, Linux
- Tools and Database: Eclipse, JUnit, MySQL, PostGreSQL
- Network: TCP/IP and UDP socket programming, RPC, CORBA.
- Analytical Software: SAS, R

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## PUBLICATIONS

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- Yonghee Shin and Laurie Williams, "Is Complexity Really the Enemy of Software Security?", *the 4<sup>th</sup> Workshop on Quality of Protection (QoP'08), co-located with CCS-2008*, Short paper, October. 2008 (To appear).
  - Yonghee Shin and Laurie Williams, "An Empirical Model to Predict Security Vulnerabilities using Code Complexity Metrics", *the 2<sup>nd</sup> International Symposium on Empirical Software Engineering and Measurement (ESEM'08)*, Short paper, October. 2008 (To appear).
  - Yonghee Shin, "Exploring Complexity Metrics as Indicators of Software Vulnerability", *the 3<sup>rd</sup> International Doctoral Symposium on Empirical Software Engineering (IDoESE'08)*, co-located with ESEM-2008, October. 2008 (To appear).
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- Ben Smith, Yonghee Shin, Laurie Williams, "Proposing SQL Statement Coverage Metrics", *the 4<sup>th</sup> International Workshop on Software Engineering for Secure Systems (SESS'08) in conjunction with the 30<sup>th</sup> International Conference on Software Engineering (ICSE'08)*, Leipzig, Germany, 17 May, 2008.
  - Yonghee Shin, "Improving the Identification of Actual Input Manipulation Vulnerabilities", *the 14th ACM SIGSOFT Symposium on Foundations of Software Engineering*, Doctoral symposium, Portland, OR. November 2006.
  - Yonghee Shin, Laurie Williams, and Tao Xie, "SQLUnitGen: SQL Injection Testing Using Static and Dynamic Analysis", *the 17th IEEE International Symposium on Software Reliability Engineering (ISSRE'06)*, Student Program, Raleigh, NC, November 2006.
  - Laurie Williams and Yonghee Shin, "Work in Progress: Exploring Security and Privacy Concepts through the Development and Testing of the iTrust Medical Records System", *the 36th Annual Frontiers in Education Conference*, San Diego, CA, October 2006, pp.30-31.

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## ACTIVITIES

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### **Co-Reviewer**

- International Conference on Software Engineering (ICSE) – 2007, 2008
- International Conference on Software Testing, Verification, and Validation (ICST) – 2007, 2008
- Agile Development Conference – 2007
- International Conference on Software Process (ICSP) – 2007
- International Symposium on Software Reliability Engineering (ISSRE) – 2007
- Asia Pacific Software Engineering Conference (APSEC) – 2006

### **Memberships**

- Student member, Association for Computer Machinery (ACM)
- Student member, Institute of Electrical and Electronics Engineers (IEEE)

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## AWARDS AND HONORS

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### **Scholarships and Fellowships**

- N.C. State Research Assistantship funded by the Graduate Student Support Plan, 2004 - Present
  - Korea IT Industry Promotion Agency Scholarship, 2001-2003
  - Korea Telecom Company Scholarship, 1988-1991
  - Sookmyung Women's University Scholarship, 1988
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