

## Nicholas Chun Yuan Chen

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CONTACT INFORMATION Department of Computer Science  
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RESEARCH INTERESTS My broad area of research lies in creating developer-oriented software tools that help developers evolve their code to improve functionality, maintainability, readability and performance. Currently, I am focusing on creating tools to help developers parallelize their sequential programs to take advantage of multi-processors.

### EDUCATION **The University of Illinois at Urbana-Champaign**

Ph.D., Computer Science (expected graduation date: June 2013)

- Topic: Interactive Source-to-source Transformations for Flow-based Applications
- Advisor: Professor Ralph E. Johnson
- Area of Study: Software Engineering

M.S., Computer Science, Dec 2008

- *EXMLREF: Extending Automated Refactoring Support Across XML Configuration Files*
- Advisor: Professor Ralph E. Johnson
- Area of Study: Software Engineering

B.S., Electrical and Computer Engineering, May 2006

- Highest Honors
- Minor in Math

### PUBLICATIONS

#### **Use, Disuse, and Misuse of Automated Refactorings**

*Mohsen Vakilian, Nicholas Chen, Stas Negara, Balaji Rajkumar, Brian Bailey and Ralph Johnson*

International Conference for Software Engineering (ICSE 2012)

#### **The Language of Languages Research Project: Unifying Concepts Expressed Across Different Notations**

*James R. Douglass, Nicholas Chen and Ralph Johnson*

SPLASH/OOPSLA 2011 Demos Track

#### **Expressing Pipeline Parallelism Using TBB Constructs: A Case Study on What Works and What Doesn't**

*Eric Reed, Nicholas Chen and Ralph Johnson*

TMC 2011 (at SPLASH/OOPSLA 2011)

**The Need for Richer Refactoring Usage Data**

*Mohsen Vakilian, Nicholas Chen, Stas Negara, et al.*  
PLATEAU 2011 (at SPLASH/OOPSLA 2011)

**Toward Dietary Assessment via Mobile Phone Video Cameras**

*Nicholas Chen, Yun Young Lee, Maurice Rabb and Bruce Schatz*  
American Medical Informatics Association 2010 Annual Symposium (AMIA)

**Feasibility of Long-term Monitoring of Everyday Health Through Smartphones**

*Nicholas Chen, Maurice Rabb, Yun Young Lee and Bruce Schatz*  
UIUC Technical Report 2010

**Personalized Implicit Health Monitors**

*Nicholas Chen, Yun Young Lee, Maurice Rabb and Bruce Schatz*  
UIUC Technical Report 2010

**Patterns for Cache Optimizations on Multi-Processor Machines**

*Nicholas Chen and Ralph Johnson*  
2nd Workshop on Parallel Programming Patterns (ParaPLoP 2010)

**A Pattern Language for Screencasting**

*Nicholas Chen and Maurice Rabb*  
16th Conference on Pattern Language of Programs (PLoP 2009)

**Topology Aware Mapping**

*Abhinav Bhatele, Laxmikant V. Kale, Nicholas Chen and Ralph Johnson*  
1st Workshop on Parallel Programming Patterns (ParaPLoP 2009)

**Collective Communication Patterns**

*Nicholas Chen, Rajesh Karmani, Amin Shali, et. al*  
1st Workshop on Parallel Programming Patterns (ParaPLoP 2009)

**Barrier Synchronization Pattern**

*Rajesh Karmani, Nicholas Chen, Bor-Yiing Su, et. al*  
1st Workshop on Parallel Programming Patterns (ParaPLoP 2009)

**Toward Refactoring in a Polyglot World**

*Nicholas Chen and Ralph Johnson*  
2nd Workshop on Refactoring Tools (WRT 2008).

SELECTED  
RESEARCH  
PROJECTS

**Transformations for Flow-based Applications** Summer 2011 - Present  
*with Ralph Johnson*

Emerging applications in the domains of recognition, mining and synthesis (RMS); image and video processing; information flow; and automatic financial trading exhibit *flow-based* forms of parallelism. Currently, developers are left with the arduous and error-prone task of parallelizing these sequential applications by hand. To alleviate this, we are creating tools for interactive source-to-source transformations. Our work will demonstrate that these tools are useful, practical and can help in a variety of different use cases.

### **CodingSpectator**

Fall 2010 - Present

*with Mohsen Vakilian, Stas Negara, Brian Bailey and Ralph Johnson*

CodingSpectator is an Eclipse plug-in developed at the University of Illinois. This plug-in listens for various actions that the user performs while working with Eclipse. CodingSpectator gathers a rich set of data about the usage of Eclipse that could reveal many interesting patterns in the usage of this IDE. CodingSpectator serves as a platform for better understanding how developers interact with their IDEs, allowing us to create tools that better align with those needs.

### **Language of Languages**

Fall 2009 - Present

*with James Douglass (The Boeing Company) and Ralph Johnson*

Maintaining the consistency of multiple notations used in large projects is daunting. Language of Languages(LoLs) is our experimental language workbench that fulfills a frequently overlooked but important role: unify the different notations so developers can better understand and evolve a project. Due to the impossibility of anticipating all the notations that may be used in a project, LoLs adopts a language agnostic view and supports different notations from free-form text to graphical forms and shapes.

### **Personal Health Instrumentation**

Fall 2009 - Fall 2010

*with Maurice Rabb, Yun Young Lee, Karrie Karahalios, Bruce Schatz and Richard Berlin (Carle Hospital)*

Current primary healthcare suffers from the single feature, single point-in-time syndrome. Typically, our vital signs are measured only when we visit a primary care facility. Even when measured, they represent only a partial snapshot of our everyday health at that moment alone — failing to capture the continuous spectrum in our lives. Without such data, primary care physicians/professionals (PCP) are limited in their ability to make informed and reliable recommendations toward improving our health. Our project aims to provide continuous monitoring through minimally-intrusive health instruments; the data collected will then be analyzed to help predict health issues.

## RESEARCH SERVICES

Demonstrations Program Committee for SPLASH 2011

Passionate on Parallelism REU and ITI Undergraduate Internship Student mentor for Summer 2011

External reviewer for ASE 2011

External reviewer for FSE 2010

Reviewer for Transactions on Pattern Languages of Programming

External reviewer for OOPSLA 2009

Student volunteer at OOPSLA 2009

Shepherd for EuroPLoP 2008

AWARDS &  
HONORS

2010 Graduate Student Outstanding Service Award  
2010 CIMIT Prize for Primary Healthcare Finalist (\$10 000 award)  
Outstanding TA award for CS242, CS427, CS428 & CS598REJ  
*Eta Kappa Nu*, Electrical and Computer Engineering Honor Society, Illinois Alpha Chapter  
*Tau Beta Pi*, Engineering Honor Society, Illinois Alpha Chapter  
Full undergraduate scholarship (2003-2006) awarded by the Public Service Department of Malaysia

SYNERGISTIC  
ACTIVITIES

Member, ACM  
Member, IEEE  
Computer Science Fellowships, Awards and Admissions (FAA) Committee, Student Representative, Fall 2010 - Spring 2011  
Computer Science Graduate Ambassador, Spring 2010, Spring 2011  
Computer Science Graduate Academic Council, Fall 2009 - Spring 2011

TEACHING  
EXPERIENCE

*Teaching Assistant – CS427/428 Software Engineering I & II*

**Outstanding TA Award**

**Fall 2007, Spring 2008, Fall 2008, Spring 2009**

- Designed homework assignments, machine problems and exams
- Utilized *Eclipse* proficiency to help students with their group projects
- Supervised group projects with biweekly milestone meetings

*Teaching Assistant – CS598REJ Object-Oriented Programming and Design*

**Outstanding TA Award**

**Summer 2007**

- Supervised group projects in Squeak Smalltalk
- Designed and graded quizzes and exams

*Teaching Assistant – CS242 Programming Studio*

**Outstanding TA Award**

**Fall 2005, Spring 2006, Fall 2006, Spring 2007**

- Collaborated with the class instructor to come up with the *original* course syllabus and weekly projects
- Designed, coded and maintained internal grading application for the course

*Undergraduate Teaching Assistant – ECE390 x86 Assembly Programming*

**Fall 2004, Spring 2005, Fall 2005**

- Held lab hours for programming assignments
- Designed and graded machine problems
- Graded homework and exams

REFEREES

Available upon request.