

# Vilas Jagannath

## EDUCATION

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**University of Illinois at Urbana-Champaign, USA** August 2006 - May 2012 (expected)  
PhD Candidate in Computer Science  
Advised by Prof. Darko Marinov and Prof. Gul Agha  
Thesis research: Improved Regression Testing of Multithreaded Programs

**University of Illinois at Urbana-Champaign, USA** July 2010  
Master of Science in Computer Science  
Thesis title: Reducing the Costs of Bounded-Exhaustive Testing

**University of Illinois at Urbana-Champaign, USA** December 2010  
Graduate Certificate in Strategic Technology Management

**University of Auckland, New Zealand** March 2001 - November 2004  
Bachelor of Engineering in Software Engineering CGPA: 7.95(A) - Highest Honors

## RESEARCH INTERESTS

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Software engineering with an emphasis on improving software reliability through software testing and analysis

## AWARDS AND HONORS

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Paper [6] was awarded the ACM SIGSOFT Distinguished Paper Award at ICSE 2010

Paper [6] was invited for submission to the ACM Transactions on Software Engineering and Methodology

Paper [7] was invited for submission to Wiley Software Testing, Verification and Reliability

Awarded ETAPS 2009 scholarship to present paper [9]

Elected best graduating Software Engineering student in 2004 (awarded by Auckland University Engineering Society)

Awarded the Kiwiplan Scholarship in 2004 for excellence in Computer Science and Software Engineering

On the Deans Honors List for 2002 and 2003

## INDUSTRY EXPERIENCE

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**Microsoft Research** Research Intern  
Mountain View, California, USA May 2010 - August 2010  
Researched and developed support for debugging DryadLINQ applications  
Technologies & tools: DryadLINQ, C#, and Visual Studio Automation Framework

**Yahoo! Inc** Software Engineering Intern  
Champaign, Illinois, USA June 2008 - August 2008  
Worked on a generic data generation tool for testing Yahoo!'s backend processes  
Chosen as the best intern project in the 'Best Practices' category  
Technologies & tools: Perl, Java, ASN, XSD, and Eclipse

**Infosys Technologies Ltd - SETLabs** Research Intern - Instep Global Internship  
Bangalore, Karnataka, India May 2007 - August 2007  
Researched techniques and tools for automating functional testing and estimating functional testing effort

Technologies & tools: Java, Digester, XMI, UML, RCP, SWT, and Eclipse

**Kiwiplan NZ Ltd**

Auckland, New Zealand

Developed the Kiwiplan Transport Scheduling System

Technologies & tools: Java, JUnit, SOA, Jini, Hibernate, MySQL, JNI, GIS, Maven, and Rational Functional Tester

**Software Engineer**

November 2004 - July 2006

**Kiwiplan NZ Ltd**

Auckland, New Zealand

Developed a customizable form navigation system for the Kiwiplan Enterprise Sales Processing system

Technologies & Tools: Visual Basic, Visual Studio, Visual Sourcesafe, RUP, and Code Generation from UML

Software Engineering Intern

November 2003 - March 2004

CONFERENCE PAPERS (PEER REVIEWED)

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- [1] V. Jagannath, M. Kirn, Y. Lin, and D. Marinov, "Evaluating Machine-Independent Metrics for State-Space Exploration," in *5th IEEE International Conference on Software Testing, Verification and Validation (ICST)*, Acceptance: 27%, 39/145, Montreal, Canada, Apr. 2012, TO APPEAR.
- [2] E. Alves, M. Gligoric, V. Jagannath, and M. D'Amorim, "Fault-Localization Using Dynamic Slicing and Change Impact Analysis," in *26th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, Short paper, Acceptance: 37%, Lawrence, Kansas, Nov. 2011, pp. 520–523.
- [3] V. Jagannath, M. Gligoric, D. Jin, Q. Luo, G. Rosu, and D. Marinov, "Improved Multithreaded Unit Testing," in *13th European Software Engineering Conference and 19th ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE)*, Acceptance: 17%, 34/203, Szeged, Hungary, Sep. 2011, pp. 223–233.
- [4] V. Jagannath, Q. Luo, and D. Marinov, "Change-Aware Preemption Prioritization," in *20th International Symposium on Software Testing and Analysis (ISSTA)*, Acceptance: 29%, 35/121, Toronto, Canada, Jul. 2011, pp. 133–143.
- [5] B. Daniel, D. Dig, T. Gvero, V. Jagannath, J. Jiaa, D. Mitchell, J. Nogiec, S. H. Tan, and D. Marinov, "ReAssert: A Tool for Repairing Broken Unit Tests," in *ACM/IEEE 33rd International Conference on Software Engineering (ICSE)*, Tool demo paper, Acceptance: 37%, 22/60, Honolulu, Hawaii, May 2011, pp. 1010–1012.
- [6] M. Gligoric, T. Gvero, V. Jagannath, S. Khurshid, V. Kuncak, and D. Marinov, "Test Generation through Programming in UDITA," in *ACM/IEEE 32nd International Conference on Software Engineering (ICSE)*, Awarded the ACM SIGSOFT Distinguished Paper Award, Invited for submission to the ACM Transactions on Software Engineering and Methodology, Acceptance: 15%, 54/380, Cape Town, South Africa, May 2010, pp. 225–234.
- [7] M. Gligoric, V. Jagannath, and D. Marinov, "MuTMuT: Efficient Exploration for Mutation Testing of Multithreaded Code," in *3rd International Conference on Software Testing, Verification and Validation (ICST)*, Invited for submission to Wiley Software Testing, Verification and Reliability, Acceptance: 27%, 41/154, Paris, France, Apr. 2010, pp. 55–64.
- [8] B. Daniel, V. Jagannath, D. Dig, and D. Marinov, "ReAssert: Suggesting Repairs for Broken Unit Tests," in *24th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, Acceptance: 18%, 38/222, Auckland, New Zealand, Nov. 2009, pp. 433–444.
- [9] V. Jagannath, Y. Y. Lee, B. Daniel, and D. Marinov, "Reducing the Costs of Bounded-Exhaustive Testing," in *12th International Conference on Fundamental Approaches to Software Engineering (FASE)*, Acceptance: 25%, 30/124, York, United Kingdom, Mar. 2009, pp. 171–185.

WORKSHOP PAPERS (PEER REVIEWED)

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- [10] V. Jagannath, Z. Yin, and M. Budiu, "Monitoring and Debugging DryadLINQ Applications with Daphne," in *16th International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS) co-located with the 25th IEEE International Parallel & Distributed Processing Symposium (IPDPS)*, Anchorage, Alaska, May 2011, pp. 1266–1273.

- [11] V. Jagannath, M. Gligoric, D. Jin, G. Rosu, and D. Marinov, “IMUnit: Improved Multithreaded Unit Testing (Position Statement),” in *3rd International Workshop on Multicore Software Engineering (IWMSE) co-located with the ACM/IEEE 32nd International Conference on Software Engineering (ICSE)*, Cape Town, South Africa, May 2010, pp. 48–49.
- [12] V. Jagannath, M. Gligoric, S. Lauterburg, D. Marinov, and G. Agha, “Mutation Operators for Actor Systems,” in *5th International Workshop on Mutation Analysis (MUTATION) co-located with the 3rd International Conference on Software Testing, Verification and Validation (ICST)*, Paris, France, Apr. 2010, pp. 157–162.
- [13] R. Sharma, M. Gligoric, V. Jagannath, and D. Marinov, “A Comparison of Constraint-based and Sequence-based Generation of Complex Input Data Structures,” in *2nd Workshop on Constraints in Software Testing, Verification and Analysis (CSTVA) co-located with the 3rd International Conference on Software Testing, Verification and Validation (ICST)*, Paris, France, Apr. 2010, pp. 337–342.

## TECHNICAL REPORTS

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- [14] M. Gligoric, T. Gvero, V. Jagannath, S. Khurshid, V. Kuncak, and D. Marinov, “On Test Generation through Programming in UDITA,” Ecole Polytechnique Fédérale de Lausanne Technical Report, Tech. Rep., Sep. 2009.
- [15] B. Daniel, V. Jagannath, D. Dig, and D. Marinov, “ReAssert: Suggesting Repairs for Broken Unit Tests,” University of Illinois Technical Report, Tech. Rep., Aug. 2009.

## SOFTWARE

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Research projects released publicly (open-source):

**IMUnit:** Improved unit testing of multithreaded code  
Available at: <http://mir.cs.illinois.edu/imunit>

**ReEx:** Re-execution based exploration of multithreaded programs  
Available at: <http://mir.cs.illinois.edu/reex>

**UDITA:** Test generation using declarative and imperative test abstractions  
Available at: <http://mir.cs.illinois.edu/udita>

**ReAssert:** Automated repair of test assertions  
Available at: <http://mir.cs.illinois.edu/reassert>

**ASTGen:** Test generation using imperative test abstractions  
Available at: <http://mir.cs.illinois.edu/astgen>

## PRESENTATIONS

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Visits:

**IMUnit: Improved Multithreaded Unit Testing**  
At Columbia University, New York, NY in August 2011

**IMUnit: Improved Multithreaded Unit Testing**  
At NEC Labs, Princeton, NJ in August 2011

**IMUnit: Improved Multithreaded Unit Testing**  
At Microsoft Research, Mountain View, CA in August 2011

**IMUnit: Improved Multithreaded Unit Testing**  
At Google, Mountain View, CA in August 2011

Conferences/Workshops:

**SMutant: A Tool for Type-Sensitive Mutation Testing in a Dynamic Language (Tool Demo)**

At ESEC/FSE, Szeged, Hungary in September 2011

**IMUnit: Improved Multithreaded Unit Testing**

At ESEC/FSE, Szeged, Hungary in September 2011

**CoDeSe: Fast Deserialization via Code Generation**

At ISSTA, Toronto, Canada in July 2011

**CAPP: Change-Aware Preemption Prioritization**

At ISSTA, Toronto, Canada in July 2011

**MuTMuT: Efficient Exploration for Mutation Testing of Multithreaded Code**

At ICST, Paris, France in April 2010

**Mutation Operators for Actor Systems**

At Mutation, Paris, France in April 2010

**Reducing the Costs of Bounded-Exhaustive Testing**

At FASE, York, UK in March 2009

Symposiums/Seminars:

**IMUnit: Improved Multithreaded Unit Testing**

At UPCRC Symposium, Intel Campus, Santa Clara, CA in August 2011

**IMUnit: Improved Multithreaded Unit Testing**

At UPCRC Illinois Summit, Refactoring Workshop, Urbana, IL in April 2011

**IMUnit: Improved Multithreaded Unit Testing**

At UPCRC Illinois Summit, Disciplined Parallel Programming Workshop, Urbana, IL in April 2011

**IMUnit: Improved Multithreaded Unit Testing**

At UPCRC Seminar, University of Illinois, Urbana, IL in April 2011

**MuTMuT: Efficient Exploration for Mutation Testing of Multithreaded Code**

At UPCRC Seminar, University of Illinois, Urbana, IL in February 2010

Lectures:

**IMUnit: Improved Multithreaded Unit Testing**

At CS 527: Advanced Topics in Software Engineering, University of Illinois, Urbana, IL in September 2011

**Automated Testing of Refactoring Engines**

At CS498DM: Software Testing, University of Illinois, Urbana, IL in April 2009

**RESEARCH SERVICE**

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Reviewer for IEEE Transactions on Software Engineering (TSE)

Secondary reviewer for ASE 2011, MBT 2010, ASE 2009, PLDI 2009, FSEN 2009, ICST 2009, ISSRE 2008, and ASE 2008

Student volunteer at OOPSLA 2009 and OOPSLA 2008

TEACHING/EDUCATIONAL SERVICE

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University of Illinois:

**Advanced Topics in Software Engineering (CS527)** Fall 2011  
Gave a guest lecture and mentored some group projects

**Software Engineering Seminar (CS591se)** Spring 2010  
Co-organized the seminar

**Software Testing (CS498dm)** Springs 2008 & 2009  
Lectured some of the classes, graded machine problems and monitored progress of group projects

**Advanced Topics in Software Engineering (CS527)** Fall 2008  
Graded paper reviews and monitored progress of group projects

University of Auckland:

**Operating Systems (SE370)** 2004  
Tutored labs and graded machine problems

**Graphical User Interfaces and Database Management (SE350)** 2004  
Graded machine problems

**Object Oriented Software Construction (SE251)** 2003  
Tutored labs and graded machine problems

OTHER ACTIVITIES

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Senator, Illinois Student Senate January 2010 - Ongoing  
Member of the Student Senate Committee on:  
    Graduate and Professional Affairs August 2009 - Ongoing  
    International, Transfer and Non-Traditional Students August 2010 - Ongoing  
Member of the Academic Senate Committee on:  
    Conduct Governance August 2011 - Ongoing  
    Information Technology August 2010 - Ongoing  
    Committees August 2010 - August 2011  
Member of a Block Grant Review Area Committee August 2010 - Dec 2010  
Member of the Engineering Dean's Graduate Student Advisory Committee January 2009 - May 2009  
Member of the Graduate College Student Advisory Committee August 2008 - May 2009  
Member of the Residence Hall Judicial Commission August 2006 - May 2008  
Placed first Google Games, Illinois April 2008  
Ran the Chicago Marathon October 2007  
Acted in On the Rocks (organized by the Krannert Center Student Association) April 2007  
Played squash for the University of Auckland Squash Club and captained a team 2003 - 2004