University of Virginia
Department of Computer Science
Charlottesville, VA

℘ *(617) 308-0637*
FAX *(434) 982-2214*
✉ *legoues@virginia.edu*
http://www.clairelegoues.com

Claire Le Goues

Research interests

My primary research interests are in programming languages and software engineering. I am especially concerned with automatically preventing, finding, understanding, and fixing bugs in software.

Education

2013 (expected)	**Ph.D.**, *Computer Science*, University of Virginia, Charlottesville, VA.
Advisor	Westley Weimer
Thesis	Automatic, Efficient, and General Repair of Software Defects
Project website	http://genprog.cs.virginia.edu
2009	**M.S.**, *Computer Science*, University of Virginia, Charlottesville, VA.
Advisor	Westley Weimer
Thesis	Specification Mining With Few False Positives
2006	**B.A.**, *Computer Science*, Harvard University, Cambridge, MA.
Advisor	Greg Morrisett
Thesis	Algebraic Type Isomorphisms

Awards

2012	**Bronze**, *ACM SIGEVO "Humies" for Human-Competitive Results Produced by Genetic and Evolutionary Computation*, $2,000.
Jan/Feb 2012	**Featured Article**, *IEEE Transactions on Software Engineering*.
2009	**Gold**, *ACM SIGEVO "Humies" for Human-Competitive Results Produced by Genetic and Evolutionary Computation*, $10,000.
2009	**IFIP TC2 Manfred Paul Award**, *International Conference on Software Engineering*.
2009	**Best Paper**, *Genetic and Evolutionary Computation Conference*.
2009	**ACM Distinguished Paper**, *International Conference on Software Engineering*.
2009	**Best Short Paper**, *Workshop on Search-Based Software Testing*.
2009–2012	**Graduate Fellowship**, *National Science Foundation*.
2008–2009	**Graduate Teaching Award**, *University of Virginia Department of Computer Science*, Voted on by the faculty. Awarded annually to 1 student of approximately 80 with the most outstanding teaching record.

Publications

Refereed Journal Articles (3 total, 1 invited, 1 featured article)

TSE '12 **Featured Article**	**Claire Le Goues**, ThanhVu Nguyen, Stephanie Forrest and Westley Weimer. GenProg: A Generic Method for Automatic Software Repair, in *IEEE Transactions on Software Engineering*, vol. 38, no. 1, pp. 54–72, 2012. *Impact Factor: 5.45*

TSE '12 — **Claire Le Goues** and Westley Weimer. Measuring Code Quality to Improve Specification Mining, in *IEEE Transactions on Software Engineering*, vol. 38, no. 1, pp. 175–190, 2012. *Impact Factor: 5.45*

CACM '10
Invited — Westley Weimer, Stephanie Forrest, **Claire Le Goues** and ThanhVu Nguyen. Automatic Repair with Evolutionary Computation, in *Communications of the ACM*, vol. 53, no. 5, pp. 109–116, May 2010. *Impact Factor: 2.94*

Refereed Conference Publications (7 total, 2 best papers)

GECCO '12 — **Claire Le Goues**, Westley Weimer and Stephanie Forrest. Representation and Operators for Improving Evolutionary Program Repair, *Genetic and Evolutionary Computation Conference*, pp. 959–966, Philadelphia, PA, USA 2012. *Acceptance Rate: 36%*

ICSE '12 — **Claire Le Goues**, Michael Dewey-Vogt, Stephanie Forrest and Westley Weimer. A Systematic Study of Automated Program Repair: Fixing 55 out of 105 bugs for $8 Each, *International Conference on Software Engineering*, pp. 3–13, Zurich, Switzerland 2012. *Acceptance Rate: 21%*

SEFM '11 — **Claire Le Goues**, K. Rustan M. Leino and Michal Moskal. The Boogie Verification Debugger (Tool Paper), *Software Engineering and Formal Methods*, pp. 407–414, Montevideo, Uruguay, 2011. *Acceptance Rate: 29%*

GECCO '10 — Ethan Fast, **Claire Le Goues**, Stephanie Forrest and Westley Weimer. Designing Better Fitness Functions for Automated Program Repair, in *Genetic and Evolutionary Computation Conference*, pp. 965–972, Portland, OR, 2010. *Acceptance Rate: 43%*

GECCO '09
Best Paper — Stephanie Forrest, Westley Weimer, ThanhVu Nguyen and **Claire Le Goues**. A Genetic Programming Approach to Automatic Program Repair, in *Genetic and Evolutionary Computation Conference*, pp. 947–954, Montreal, QC, Canada, 2009. *Acceptance Rate: 32%*

ICSE '09
Distinguished Paper
Manfred Paul Award — Westley Weimer, ThanhVu Nguyen, **Claire Le Goues** and Stephanie Forrest. Automatically Finding Patches Using Genetic Programming, in *International Conference on Software Engineering*, pp. 364–374, Vancouver, BC, Canada, 2009. *Acceptance Rate: 12%*

TACAS '09 — **Claire Le Goues** and Westley Weimer. Specification Mining With Few False Positives, in *Tools and Algorithms for the Construction and Analysis of Systems*, pp. 292–306, York, UK, 2009. *Acceptance Rate: 20%*

Refereed Workshop Publications (2 total, 1 best paper)

FoSER '10 — **Claire Le Goues**, Stephanie Forrest and Westley Weimer. The Case for Software Evolution, in *FSE Working Conference on the Future of Software Engineering*, pp. 205–210, Santa Fe, NM, USA, 2010.

SBST '09
Best Short Paper — ThanhVu Nguyen, Westley Weimer, **Claire Le Goues** and Stephanie Forrest. Extended Abstract: Using Execution Paths to Evolve Software Patches, in *Search-Based Software Testing*, pp. 152–153, Denver, CO, USA, 2009.

Book Chapters (1 total)

Claire Le Goues, Anh Nguyen-Tuong, Hao Chen, Jack W. Davidson, Stephanie Forrest, Jason D. Hiser, John C. Knight and Matthew Gundy. Moving Target Defenses in the Helix Self-Regenerative Architecture, in *Moving Target Defense II, Advances in Information Security*, vol. 100, pp. 117–149, 2013.

Tutorials (1 total)

GECCO '12   Stephanie Forrest and **Claire Le Goues**. Evolutionary software repair, in *GECCO (Companion)*, pp. 1345–1348, Philadelphia, PA, USA, 2012.

Industrial Experience

2009   **Research Intern**, *Microsoft Research*, Research in Software Engineering (RiSE) group, Redmond, WA.

Mentor   K. Rustan M. Leino

Developed visualization techniques for formal program verification to enable effective adoption of verification technology. Prototyped a tool for debugging verification failures. The tool and codebase is available through Microsoft's open-source repository. The work resulted in a publication.

2006-2007   **Software Engineer**, *IBM Software*, XML Technologies/Compiler group, Cambridge, MA.

Supervisor   Patrick McManus

Developed and maintained the Datapower SOA appliance, which facilitates rapid and secure XML processing on large networks. Worked with a six-person team on a new internal programming language and a substantial rewrite of portions of the appliance's XML compiler.

2005   **Research Intern**, *IBM Research*, Collaborative User Experience (CUE) group, Cambridge, MA.

Mentor   Steve Rohall

Prototyped a real-time tool to allow users to collaborate in the open-source Open Office application.

2004   **Research Intern**, *Architect's Workbench group*, IBM Research, Hawthorne, NY.

Mentor   Steven Abrams

Worked with a team developing a tool that assists IT architects in the design of large systems. Added a number of features to an extensive existent code base.

Teaching Experience

All teaching experience gained while at the University of Virginia.

Guest Lecturer

2012   **CS1120**, *From Ada and Euclid to Quantum Computing and the World Wide Web*, Objects and Python Interpreters.

2011   **CS4610**, *Programming Languages*, Introduction to Static Semantics.

2011   **CS6610**, *Graduate Programming Languages*, Dependent types and data abstraction.

2010   **CS1120**, *From Ada and Euclid to Quantum Computing and the World Wide Web*, Implementing Interpreters and Charme.

2008   **CS210**, *Software Development Methods*, Data Structures: Trees and Grammars.

Teaching Assistant

2007–2008	**CS210**, *Software Development Methods*, Head TA; led weekly lab and office hours, coordinated grading and TA responsibilities.
2008	**CS415**, *Programming Languages*, Graded, developed and led test review and weekly discussion section.

Advising Experience

All mentees supervised while at the University of Virginia.

Undergraduate students

2011–present	**Shirley Park**, Collaborating on a conference submission, currently applying to graduate school.
2011	**Michael Dewey-Vogt**, Collaborated on a successful conference submission, currently employed as a software engineer.
2010	**Ethan Fast**, Collaborated on a successful conference submission, currently a doctoral student at Stanford.
2009	**Sam Block**, Completed senior thesis project, currently employed as a software engineer.

Graduate students

2009–2011	**Gu Lin**, Completed and defended Masters thesis.

Miscellaneous

Languages	Natively fluent in English and French, written and spoken.
Citizenship	Dual US-French/EU citizen.

References

Westley Weimer *(advisor)*
Associate Professor
Dept. of Computer Science, University of Virginia
Charlottesville, VA
http://www.cs.virginia.edu/~weimer
434-924-1021
weimer@cs.virginia.edu

Stephanie Forrest
Professor
Dept. of Computer Science, University of New Mexico
Albuquerque, NM
http://www.cs.unm.edu/~forrest
505-277-7104
forrest@cs.unm.edu

John C. Knight
Professor
Dept. of Computer Science, University of Virginia
Charlottesville, VA
http://www.cs.virginia.edu/~jck
434-982-2216
knight@cs.virginia.edu

Mark Harman
Professor of Software Engineering
Dept. of Computer Science, University College London
London, UK
http://www.cs.ucl.ac.uk/staff/mharman
+44 (0)20 7679 1305
mark.harman@ucl.ac.uk