

CINDY RUBIO GONZÁLEZ

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Research Interest

My research areas of interest are programming languages and software engineering, in particular program analysis and software testing. My focus is on developing and applying program-analysis techniques to make software more reliable and efficient.

Education

- 2006–2012 **Ph.D. in Computer Science**
University of Wisconsin–Madison.
- Thesis title: "Finding Error-Propagation Bugs in Large Software Systems Using Static Analysis".
- Thesis advisor: Ben Liblit.
- Ph.D. Minor in Piano Performance.
- 2002–2004 **Master of Science in Computer Science**
University of Wisconsin–Milwaukee.
- Thesis title: "Class Invariant Shape Analysis".
- Thesis advisor: Adam Brooks Webber.
- 1996–2000 **Bachelor of Science in Computer Systems Engineering**
Saltillo Institute of Technology, Saltillo, Coahuila, Mexico.
- Ranking: 1/300. Summa Cum Laude (Mención Honorífica).
- 1991–1999 **Bachelor of Music in Piano Performance**
Autonomous University of Coahuila, Saltillo, Coahuila, Mexico.
- Ranking: 1/4 (from an initial class size of 100).
- Normal duration of this program is 8 years. Granted admission at the age of 11.
- Completed middle school, high school and the first 6 semesters of CS while enrolled in this program.

Work Experience

- 11/2014–Present **Assistant Professor**, *Department of Computer Science.*
University of California, Davis.
- 09/2012–
09/2014 **Postdoctoral Researcher**, *Department of Electrical Engineering and Computer Science.*
University of California, Berkeley.
Mentors: Koushik Sen, James Demmel, and Costin Iancu (LBNL).
- 09/2006–
08/2012 **Graduate Research Assistant**, *Department of Computer Sciences.*
University of Wisconsin–Madison.
Advisor: Ben Liblit.
- 05/2009–
08/2009 **Research Intern**, *Software Reliability Research.*
Microsoft Research.
Mentors: Patrice Godefroid and Shuvendu Lahiri.
- 05/2008–
08/2008 **Research Intern**, *Software Reliability Research.*
Microsoft Research.
Mentors: Patrice Godefroid.

Publications

Peer-Reviewed Conference and Workshop Papers

- [ICSE'16] **C. Rubio-González**, C. Nguyen, B. Mehne, K. Sen, J. Demmel, W. Kahan, C. Iancu, W. Lavrijsen, D. H. Bailey, and D. Hough. "Floating-Point Precision Tuning Using Blame Analysis". To appear in *Proceedings of the 38th International Conference on Software Engineering (ICSE'16)*, May 2016, Austin, TX. Acceptance rate: $101/530 = 19\%$.
- [ICSE'15] C. Weiss, **C. Rubio-González**, and B. Liblit. "Database-Backed Program Analysis for Scalable Error Propagation". In *Proceedings of the 37th International Conference on Software Engineering (ICSE'15)*, May 2015, Florence, Italy. Acceptance rate: $84/452 = 18.5\%$.
- [PLATEAU'14] J. Galenson, **C. Rubio-González**, S. Chasins, and L. Gong. "Research.js: Evaluating Research Tool Usability on the Web". In *Proceedings of the 5th Workshop on Evaluation and Usability of Programming Languages and Tools (PLATEAU'14)*, October 2014, Portland, OR.
- [NFM'14] S. Arlt, **C. Rubio-González**, P. Rümmer, M. Schäf, and N. Shankar. "The Gradual Verifier". In *Proceedings of the 6th NASA Formal Methods Symposium (NFM'14)*, April 2014, Houston, TX. Acceptance rate: $29/83 = 35\%$.
- [SC'13] **C. Rubio-González**, C. Nguyen, H. D. Nguyen, J. Demmel, W. Kahan, K. Sen, D. H. Bailey, C. Iancu, and D. Hough. "Precimonious: Tuning Assistant for Floating-Point Precision". In *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'13)*, November 2013, Denver, CO. Acceptance rate: $91/457 = 20\%$.
- [SAS'11] P. Godefroid, S.K. Lahiri, and **C. Rubio-González**. "Statically Validating Must Summaries for Incremental Compositional Dynamic Test Generation". In *Proceedings of the 18th International Static Analysis Symposium (SAS'11)*, Sep 2011, Venice, Italy. Acceptance rate: $22/67 = 33\%$.
- [ISSTA'11] **C. Rubio-González**, and B. Liblit. "Defective Error/Pointer Interactions in the Linux Kernel". In *Proceedings of the 20th International Symposium on Software Testing and Analysis (ISSTA'11)*, July 2011, Toronto, Canada. Acceptance rate: $35/121 = 29\%$.
- [GHC'11] **C. Rubio-González**, and B. Liblit. "Finding Error-Handling Bug in Systems Code Using Static Analysis". In *Proceedings of the 11th Grace Hopper Celebration of Women in Computing (GHC'11)*, PhD Forum, November 2011, Portland, OR. Acceptance rate: $10/17 = 59\%$.
- [PASTE'10] **C. Rubio-González**, and B. Liblit. "Expect the Unexpected: Error Code Mismatches Between Documentation and the Real World". In *Proceedings of 9th ACM SIGPLAN/SIGSOFT Workshop on Program Analysis for Software Tools and Engineering, (PASTE'10)*, June 2010, Toronto, Canada. Acceptance rate: $12/29 = 41\%$.
- [PLDI'09] **C. Rubio-González**, H.S. Gunawi, B. Liblit, R.H. Arpaci-Dusseau, and A.C. Arpaci-Dusseau. "Error Propagation Analysis for File Systems". In *Proceedings of the 2009 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI'09)*, June 2009, Dublin, Ireland. Acceptance rate: $41/194 = 21\%$.
- [FAST'08] H.S. Gunawi, **C. Rubio-González**, A.C. Arpaci-Dusseau, R.H. Arpaci-Dusseau, and B. Liblit. "EIO: Error-handling is Occasionally Correct". In *Proceedings of the 6th USENIX Conference on File and Storage Technologies (FAST'08)*, February 2008, San Jose, CA. Acceptance rate: $21/94 = 22\%$.
- Theses **C. Rubio-González**. "Finding Error-Propagation Bugs in Large Software Systems Using Static Analysis". Ph.D. thesis, Department of Computer Sciences, University of Wisconsin–Madison, August 2012.
- C. Rubio**. "Class Invariant Shape Analysis". Master's thesis, Department of Electrical Engineering and Computer Science, University of Wisconsin–Milwaukee, December 2004.

Patent P. Godefroid, S.K. Lahiri, and **C. Rubio-González**. “Incremental Compositional Dynamic Test Generation”. United States Patent Number 8,578,344 issued in November 2013.

Presentations

Technical Presentations

05/2016 **Floating-Point Precision Tuning Using Blame Analysis**, International Conference on Software Engineering (ICSE), Austin, TX.

Dynamic Analyses for Floating-Point Precision Tuning.

05/2016 Ecole Thématique Maths-Info-HPC, St Germain au Mont d’Or, France - 2hr Lecture.

05/2016 Sixth Summer School on Formal Techniques, Atherton, CA - 1hr Lecture.

Scalable Program Analyses to Improve Software Reliability.

06/2015 Information Science & Technology Seminars, Los Alamos National Laboratory, Los Alamos, NM.

04/2015 Salishan Conference for High-Speed Computing, Gleneden, OR.

05/2014 **Precision Tuning of Floating-Point Programs**, Berkeley Programming Systems (Chaperone) Retreat, Santa Cruz, CA.

Improving Software Reliability and Performance Using Program Analysis.

04/2014 University of California, Irvine, Irvine, CA.

03/2014 University of Texas at Dallas, Dallas, TX.

03/2014 University of California, Davis, Davis, CA.

02/2014 The University of New York at Buffalo, Buffalo, NY.

02/2014 College of William and Mary, Williamsburg, VA.

02/2014 SRI International, Menlo Park, CA.

Precimonious: Tuning Assistant for Floating-Point Precision.

01/2014 UC Berkeley ASPIRE Winter Retreat, Tahoe, CA.

12/2013 Bay Area Scientific Computing Day (BASCD’13), LBNL, Berkeley, CA.

11/2013 Conference for High Performance Computing, Storage and Analysis (SC’13), Denver, CO.

11/2013 Massachusetts Institute of Technology, Cambridge, MA.

08/2013 Oracle Corporation, Compiler Technical Talks Series, Santa Clara, CA.

06/2013 Lawrence Berkeley National Laboratory DEGAS Retreat, Santa Cruz, CA.

Finding Error-Handling Bugs in Systems Software Using Static Analysis.

05/2012 University of California, Berkeley, Berkeley, CA.

04/2012 IBM Research, T.J. Watson Research Center, Hawthorne, NY.

04/2012 Oracle Labs, Redwood City, CA.

04/2012 GrammaTech, Ithaca, NY.

04/2012 Fusion-io, Santa Clara, CA.

04/2012 NetApp, Sunnyvale, CA.

04/2012 Virginia Tech, Blacksburg, VA.

03/2012 Microsoft Research, Redmond, WA.

Statically Validating Must Summaries for Incremental Dynamic Test Generation.

09/2011 International Static Analysis Symposium (SAS’11), Venice, Italy.

09/2011 University of Wisconsin–Madison, Programming Languages Seminar, Madison, WI.

Defective Error/Pointer Interactions in the Linux Kernel.

- 07/2011 International Symposium on Software Testing and Analysis (ISSTA'11), Toronto, Canada.
 07/2011 University of Wisconsin–Madison, Programming Languages Seminar, Madison, WI.
Finding Error-Handling Bugs in Systems Code Using Static Analysis.
 11/2011 Grace Hopper Celebration of Women in Computing (GHC'11), PhD Forum, Portland, OR.
 09/2011 École Polytechnique Fédérale de Lausanne (EPFL), Systems Seminar, Lausanne, Switzerland.
 06/2011 Google Inc, Madison, WI.
 06/2011 Conference on Programming Languages Design and Implementation (PLDI'11), Student Research Competition, San Jose, CA.
Error Code Mismatches Between Documentation and the Real World.
 06/2010 Workshop on Program Analysis for Software Tools and Engineering (PASTE'10), Toronto, Canada.
 05/2010 University of Wisconsin–Madison, Programming Languages Seminar, Madison, WI.
Error Propagation Analysis for File Systems.
 08/2010 Stanford University, Stanford Software Seminar, Stanford, CA.
 08/2010 Mozilla Corporation, Mozilla Research Talks Series, Mountain View, CA.
 06/2009 Conference on Programming Languages Design and Implementation (PLDI'09), Dublin, Ireland.
 06/2009 Microsoft Research, Redmond, WA.
 05/2009 University of Wisconsin–Madison, Programming Languages Seminar, Madison, WI.
 08/2009 **Incremental Compositional Dynamic Test Generation**, Microsoft Research, Redmond, WA.
Improving Dynamic Test Generation Using Loop Invariants.
 08/2008 Microsoft's Center for Software Excellence, Redmond, WA.
 08/2008 Microsoft Research, Redmond, WA.

Mentoring + Research Talks

- 07/2016 Invited Speaker, UC Davis C-STEM Center Robotics Camp.
 06/2016 Invited Panelist, What I Wish I Knew When I Started Grad School, Programming Languages Mentoring Workshop PLMW@PLDI, Santa Barbara, CA.
 03/2015 Keynote Speaker, NWCIT Aspirations in Computing Awards Ceremony, Davis, CA.
 02/2015 Keynote Speaker, #FixIT Hackathon, Universidad Autonoma de Mexico (UNAM), Mexico City.
 01/2015 Presenter at Woodland High School, Woodland CA.
 06/2014 Invited Panelist, 2014 Google Scholar's Retreat Outreach Panel, Google, Mountain View, CA.

Non-Technical Refereed Presentations

- 09/2010 **C. Rubio-González**, I. Burcea, R. Enciso, S. Sadarshi, and Y. Watanabe. "Conference Networking Across Boundaries". Grace Hopper Celebration of Women in Computing (GHC'10), Birds of a Feather (BoF), Atlanta, GA.
 09/2010 B. Poblete, I. Burcea, R. Enciso, G. Garreton, **C. Rubio-González**, A. Juarez-Dominguez, S. Pehlivan, V. Herskovic, and S. Kini, S. Bhattachalya. "Minorities without Borders: Giving Back to Developing Countries". Grace Hopper Celebration of Women in Computing (GHC'10), Birds of a Feather (BoF), Atlanta, GA.
 09/2009 **C. Rubio-González**, D. M. Abreu, R. Enciso, A. Koufakou, and J. Simmonds. "Cross-Cultural Communication Challenges Faced by Women in Computing". Grace Hopper Celebration of Women in Computing (GHC'09), Birds of a Feather (BoF), Tucson, AZ.

Research Grants

- 07/2016 Principal Investigator, NSF CISE Research Infrastructure (CRI) grant, \$1,033,655.00 (with co-PIs Premkumar Devanbu and Bogdan Vasilescu).
- 03/2015 Principal Investigator, NSF CRII grant, \$182,500.00.
- 01/2011 Mozilla Corporation, \$56,000.00 (with Prof. Ben Liblit).

Teaching Experience

Instructor, *University of California, Davis*, CS Department.

- Winter 2016 ECS 140A Programming Languages (Undergraduate Level).
- Fall 2015 ECS 260 Software Engineering (Graduate Level).
- Spring 2015 ECS 260 Software Engineering (Graduate Level).
- Winter 2015 ECS 289C Seminar on Program Analysis (Graduate Level).

01/2002–
05/2006 **Teaching Assistant**, *University of Wisconsin–Milwaukee*, EECS Department.

Conducted two to three weekly 2-hour lab sections of 25 students each. Composed and graded midterms, quizzes, lab exercises and programming assignments. Wrote solutions to all assignments and held office hours. Courses:

- CS 132 Introduction to Computers and Programming (01/2002-12/2005).
- CS 251 Intermediate Computer Programming (01/2006-05/2006).

01/2004–
05/2005 **Lecturer**, *University of Wisconsin–Milwaukee*, EECS Department.

Taught two lectures per week to an average of 25 students. Composed and graded exams and lab assignments. Wrote solutions to all assignments and held office hours. Courses:

- CS 132 Introduction to Computers and Programming (06/2004-08/2004, 01/2005-05/2005).
- CS 140 Introduction to the Computer Science Labs (01/2004-05/2004).

06/1994–
12/1997 **Piano Instructor**, *Autonomous University of Coahuila*, School of Music.

Taught piano lessons to an average of 10 students per course period (7 semesters).

Fellowships and Scholarships

06/2009 **Google Anita Borg Scholarship Finalist.**

One of fifty scholars selected among more than 400 applicants. Attended the 2009 Google Scholars Retreat in Mountain View, CA.

2008–2009 **AAUW International Doctoral Fellowship.**

Awarded by the American Association of University Women. One of two computer scientist fellows out of 75 fellows (selected among 1050 applicants). One of two Mexican fellows.

2002–2007 **CONACYT Graduate Fellowship.**

Awarded by the National Council of Science and Technology (Mexico) to pursue graduate studies abroad. This fellowship is comparable to an NSF Graduate Fellowship.

06/2006 **Google Anita Borg Scholarship Finalist.**

One of forty seven finalists selected among 324 applicants from 90 different universities across the country. Attended the 2006 Google Scholars Retreat in Mountain View, CA.

2003–2004 and
2006–2007 **SEP Graduate Scholarship.**

Awarded by the Secretariat of Public Education (Mexico). One of eighty scholars (from all fields of study) nationwide. Received twice.

Awards and Honors

- 11/2014 **CAMPOS Faculty Scholar, UC Davis.**
Scholars are selected for their transformative thinking, interdisciplinary approaches, and leadership potential to impact their STEM discipline in profound and enduring ways. One of six awardees campus wide.
- 09/2013 **Young Researcher Participant in the 1st Heidelberg Laureate Forum 2013.**
Abel, Fields and Turing Awards Meet the Next Generation, Heidelberg, Germany. One of 200 young mathematicians and computer scientists selected among more than 600 applicants from around the world.
- 06/2011 **PLDI Student Research Competition, Second Place.**
Title: Finding Error-Handling Bugs in Systems Code Using Static Analysis. Graduate Category.
- 03/2009 **National Youth Award for Outstanding Academic Achievement, Nominated.**
Premio Nacional de la Juventud. Nominated by the State of Coahuila to receive this award, presented by the President of Mexico each year.
- 12/2007 **State Youth Award for Outstanding Academic Achievement, First Place.**
Premio Estatal de la Juventud. The highest academic honor presented each year to a citizen not older than 29. Personally received from the Governor of Coahuila. Selected among 418 nominees from across the state.
- 11/2007 **Distinguished Alumna Award.**
Awarded by the Ateneo Fuente High School in the celebration of its 140th Anniversary.
- 2003-2006 **Chancellor's Graduate Student Award.**
Awarded by the University of Wisconsin-Milwaukee. Received three times.
- 06/2001 **"Nazario S. Ortiz Garza" Diploma and Medal for Academic Excellence.**
Awarded by the State of Coahuila for Academic Excellence in Computer Engineering. Personally received from the Governor of Coahuila.
- 02/2001 **Best Graduating Student in Computing Engineering.**
Awarded by the Saltillo Institute of Technology. Highest GPA over the four years of undergraduate studies among those graduating with a Computer Engineering degree.
- 02/2001 **Best Graduating Student of Class 2000.**
Awarded by the Saltillo Institute of Technology. Highest ranked student among all those graduating from all departments.
- 01/2001 **Summa Cum Laude (Mención Honorífica).**
Awarded by the Saltillo Institute of Technology. Only awardee among 300 graduating students.
- 11/1999 **"Juan Antonio de la Fuente" Diploma and Medal for Academic Excellence.**
Awarded by the Autonomous University of Coahuila. The highest honor presented to students. Personally received from the University President.
- 06/1999 **"Nazario S. Ortiz Garza" Diploma and Medal for Academic Excellence.**
Awarded by the State of Coahuila for Academic Excellence in Music. Personally received from the Governor of Coahuila.
- 06/1999 **Best Graduating Student in Music Performance.**
Awarded by the School of Music at the Autonomous University of Coahuila. Highest GPA over the eight years of undergraduate studies.

Professional Activities

Conference Organization

- 2017 PC Member, International Symposium on Software Testing and Analysis (ISSTA'17).
- 2017 PC Member, International Conference on Compiler Construction (CC'17).
- 2016 PC Member, Conference on Programming Language Design and Implementation (PLDI'16).

- 2016 PC Member, Conf. for High Performance Computing, Networking, Storage, and Analysis (SC'16).
- 2016 PC Member, USENIX Workshop on Hot Topics in Storage and File systems (HotStorage'16).
- 2016 SRC Co-Chair, International Symposium on the Foundations of Software Engineering (FSE'16).
- 2016 SRC Selection Committee Member, Conference on Programming Language Design and Implementation (PLDI 2016).
- 2015 PC Member, Latin American Women in Technology (LAtINiTY'15).
- 2015 Publication Chair, Conference on Parallel Architectures and Compilation Techniques (PACT'15).

External Reviewer

- 2012, 2014 Conference on Programming Language Design and Implementation (PLDI).
- 2014 International Conference on Computer Aided Verification (CAV).
- 2014 International Parallel and Distributed Processing Symposium (IPDPS).
- 2014 International Symposium on High Performance Computer Architecture (HPCA).
- 2011, 2013 Conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA).
- 2013 International Computers, Software and Applications Conference (COMPSAC).
- 2013 Symposium on Principles and Practice of Parallel Programming (PPoPP).
- 2009 Working Conference on Mining Software Repositories (MSR).

Service

- 2016 Hiring Committee, Department of Computer Science, University of California, Davis.
- 2015 Proposal Review Panel, National Science Foundation (NSF).
- 2015 UC Mexus-Conacyt Review Panel for Engineering and Computer Science.
- 2015 Proposal Review Panel, National Science Foundation (NSF).
- 2015 Graduate Admissions Committee, Department of Computer Science, University of California, Davis.
- 2009 Graduate Admissions Committee, Department of Computer Sciences, University of Wisconsin-Madison.

Professional Development

- 03/2016 Leadership Institute Phase 2, UC Davis ADVANCE CAMPOS, Davis, CA.
- 08/2015 Leadership Institute, UC Davis ADVANCE CAMPOS, Davis, CA.
- 06/2015 CRA-W Early Career Mentoring Workshop, FCRC'15, Portland, OR.
- 07/2014 Leadership Skills for Engineering and Science Faculty Workshop, MIT, Cambridge, MA.
- 11/2013 2nd Rising Stars in EECS Workshop, MIT, Cambridge, MA.
- 01/2012 2012 Google Graduate Researchers in Academia of Diverse Backgrounds (GRAD) CS Forum, Google Inc., Mountain View, CA.
- 06/2011 CRA-W Career Mentoring Workshop, FCRC'11, San Jose, CA.
- 07/2007 Summer School on Language-Based Techniques for Integrating with the External World, July 18-26 2007, University of Oregon, Portland, OR.

Mentoring and Leadership Activities

10/2008–Present

Member of Latinas in Computing.

A community created by and for the Latinas in computing with a mission of promoting their representation and success in computing related fields.

- 01/2013–
09/2014 **WICSE AWE Mentor**, *University of California, Berkeley*.
Part of the WICSE AWE Mentoring Program for undergraduate CS female students.
- 05/2011–
08/2012 **WACM President**, *University of Wisconsin–Madison*.
WACM is the University of Wisconsin–Madison’s student chapter of ACM-W (ACM’s committee on Women in Computing). WACM provides social, educational and outreach for women in the CS Department.
- 09/2006–
05/2011 **WACM Vice President**, *University of Wisconsin–Madison*.
Served as Vice Present of the UW–Madison ACM’s committee on Women in Computing.
- 02/2010–
08/2012 **Graduate CS Mentor**, *University of Wisconsin–Madison*.
Part of the WACM Mentoring Program for undergraduate female students.
- 03/2009–
05/2012 **Anita Borg Institute Ambassador**, *USA*.
The ABI Ambassadors is a network of technical women leaders who are passionate about ABI’s mission, engaged in ABI’s programs, and working to improve technical women’s opportunities and impact in their own organizations. Ambassador representing Latinas in Computing.
- 12/2008–
07/2009 **Girl Game Company Virtual Mentor**, *USA*.
The aim of the Girl Game Company is to increase middle school girls’ interest, ability and motivation to pursue courses and careers in Computer Science. Mentored two Latinas from California.

Music Activities

- 09/2006–
05/2009 Advanced piano lessons with internationally acclaimed pianist Christopher Taylor, School of Music, University of Wisconsin–Madison.
- Participated in more than 100 recitals as soloist as well as piano accompanist. Performed in the Mexican States of Coahuila, Nuevo Leon, Chihuahua, Puebla, and Tlaxcala.

Personal Information

Country of Citizenship: Mexico, Visa Status: H-1B