

CINDY RUBIO GONZÁLEZ

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Research Interest

My research area of interest is programming languages, in particular program analysis. My focus is on developing and applying new program-analysis techniques to make software more reliable. I am particularly interested in error handling in systems software.

Education

- 2006–Present **Ph.D. in Computer Science, Minor in Piano Performance**
University of Wisconsin–Madison, Madison, WI.
- Research Area: Programming Languages and Compilers.
 - Advisor: Ben Liblit.
 - CS GPA: 3.8/4.00, Cumulative GPA: 3.55/4.00.
 - Expected graduation date: August 2012.
- 2002–2004 **Master of Science in Computer Science**
University of Wisconsin–Milwaukee, Milwaukee, WI.
- Thesis title: Class Invariant Shape Analysis.
 - Thesis advisor: Adam Brooks Webber.
 - Cumulative GPA: 3.76/4.00.
- 1996–2000 **Bachelor of Science in Computer Systems Engineering**
Saltillo Institute of Technology, Saltillo, Coahuila, Mexico.
- Cumulative GPA: 98.9/100. Ranking: 1/300.
 - Only student awarded Summa Cum Laude (Mención Honorífica)
- 1991–1999 **Bachelor of Music in Piano Performance**
Autonomous University of Coahuila, Saltillo, Coahuila, Mexico.
- Cumulative GPA: 94.75/100. 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 first 6 semester of CS while enrolled in this program.

Publications

Peer-Reviewed Conference Papers

- [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*, September 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*, July 2011, Toronto, Canada. Acceptance rate: 35/121 = 29%.
- [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*, 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*, February 2008, San Jose, CA. Acceptance rate: 21/94 = 22%.

Peer-Reviewed Workshop Papers

- [GHC'11] **C. Rubio-González**, and Ben Liblit. "Finding Error-Handling Bug in Systems Code Using Static Analysis". In *Proceedings of the 11th Grace Hopper Celebration of Women in Computing* (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*, June 2010, Toronto, Canada. Acceptance rate: $12/29 = 41\%$.

Dissertations

C. Rubio-González. "Finding Error-Handling Bugs in Systems Code Using Static Analysis". Ph.D. Dissertation, Computer Sciences Department, University of Wisconsin–Madison. In progress.

C. Rubio. "Class Invariant Shape Analysis". Master's thesis, Department of Electrical Engineering and Computer Science, University of Wisconsin–Milwaukee, December 2004.

Posters

- [PLDI'11] "Finding Error-Handling Bugs in Systems Code Using Static Analysis". *32nd ACM SIGPLAN Conference on Programming Language Design and Implementation* (Student Research Competition), June 2011, San Jose, CA.
- Won **Second place** in the *Graduate Category* and will participate in the ACM Student Research Competition Grand Finals in March 2012.
- [PLOSA'09] "Error Propagation Analysis for File Systems". *CRA-W/CDC Programming Languages, Operating Systems, and Architecture Workshop*, co-located with the Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'09), March 2009, Washington, D.C.

Presentations

Technical Presentations

- 11/2011 Grace Hopper Celebration of Women in Computing (GHC'11), PhD Forum, "Finding Error-Handling Bugs in Systems Code Using Static Analysis", Portland, OR.
- 09/2011 École Polytechnique Fédérale de Lausanne (EPFL), Systems Seminar, "Finding Error-Handling Bugs in Systems Code Using Static Analysis", Lausanne, Switzerland.
- 09/2011 International Static Analysis Symposium (SAS'11), "Statically Validating Must Summaries for Incremental Compositional Dynamic Test Generation", Venice, Italy.
- 09/2011 University of Wisconsin–Madison, Programming Languages Seminar, "Statically Validating Must Summaries for Incremental Compositional Dynamic Test Generation", Madison, WI.
- 07/2011 International Symposium on Software Testing and Analysis (ISSTA'11), "Defective Error/Pointer Interactions in the Linux Kernel", Toronto, Canada.
- 07/2011 University of Wisconsin–Madison, Programming Languages Seminar, "Defective Error/Pointer Interactions in the Linux Kernel", Madison, WI.
- 06/2011 Invited talk at Google Inc, "Finding Error-Handling Bugs in Systems Code Using Static Analysis", Madison, WI.
- 06/2011 Conference on Programming Languages Design and Implementation (PLDI'11), Student Research Competition, "Finding Error-Handling Bugs in Systems Code Using Static Analysis", San Jose, CA.
- 08/2010 Stanford University, Stanford Software Seminar, "Error Propagation Analysis for File Systems" (extended version), Stanford, CA.

- 08/2010 Invited talk at Mozilla Corporation, Mozilla Research Talks Series, “Error Propagation Analysis for File Systems” (extended version), Mountain View, CA.
- 06/2010 Workshop on Program Analysis for Software Tools and Engineering (PASTE’10), “Expect the Unexpected: Error Code Mismatches Between Documentation and the Real World”, Toronto, Canada.
- 05/2010 University of Wisconsin–Madison, Programming Languages Seminar, “Expect the Unexpected: Error Code Mismatches Between Documentation and the Real World”, Madison, WI.
- 08/2009 Microsoft Research, “Incremental Compositional Dynamic Test Generation”, Redmond, WA.
- 06/2009 Conference on Programming Languages Design and Implementation (PLDI’09), “Error Propagation Analysis for File Systems”, Dublin, Ireland.
- 06/2009 Microsoft Research, “Error Propagation Analysis for File Systems”, Redmond, WA.
- 05/2009 University of Wisconsin–Madison, Programming Languages Seminar, “Error Propagation Analysis for File Systems”, Madison, WI.
- 08/2008 Microsoft’s Center for Software Excellence, “Improving Dynamic Test Generation Using Loop Invariants”, Redmond, WA.
- 08/2008 Microsoft Research, “Improving Dynamic Test Generation Using Loop Invariants”, Redmond, WA.

Non-Technical Refereed Presentations

- 09/2010 **C. Rubio-González**, I. Burcea, R. Enciso, S. Sadarshti, 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. Garretton, **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 Experience

- 09/2006–Present **Graduate Research Assistant**, *University of Wisconsin–Madison*, CS Department
 Advisor: Ben Liblit.
 Designed and implemented a tool that performs interprocedural static analysis using weighted pushdown systems (WPDS) to find how error codes are propagated through Linux file system implementations and drivers. Found hundreds of error-handling bugs confirmed by developers. Tool used by the NASA/JPL laboratory for reliable software. Currently exploring aspects of error handling in systems software, disk-based program analysis techniques, and working towards applying the error propagation analysis to the Mozilla code base.
- 05/2009–
08/2009 **Research Intern**, *Microsoft Research*, Software Reliability Research
 Mentors: Patrice Godefroid and Shuvendu Lahiri.
 Made compositional dynamic test generation (as implemented in SAGE – Scalable, Automated, Guided Execution) incremental by using static analysis to determine whether program summaries of one version of a program are still valid in another version of the same program. Reported results for various versions of three large Windows image parsers (published in SAS’11).
 - P. Godefroid, S.K. Lahiri, and **C. Rubio-González**. “Incremental Compositional Dynamic Test Generation”. U.S. Patent filed by Microsoft Corporation in June 2010.

- 05/2008–
08/2008 **Research Intern, Microsoft Research, Software Reliability Research**
Mentor: Patrice Godefroid.
Improved dynamic test generation (as implemented in SAGE) using static analysis, in particular loop invariants. Studied input-dependent loops in several Windows applications.

Teaching Experience

- 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).

Industry Experience

- 09/2000–
01/2001 **Intern, Daimler Chrysler of Mexico, Information Technology Department, Saltillo, Mexico.**
Responsible for project management and technical support.

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.
- 1996-2000 **TELMEX Foundation Scholarship.**
National level scholarship to pursue undergraduate studies (Mexico).
- 1996-2000 **Scholarship for Outstanding Academic Achievement.**
Awarded by Saltillo Institute of Technology to top undergraduate students.
- 1996-2000 **Ateneo Fuente High School Foundation Scholarship.**
Awarded to the top 10 students from over 600 students graduating from High School to pursue undergraduate studies.

- 1996-1999 **Art Scholarship.**
Awarded by the Autonomous University of Coahuila to top undergraduate students in the Arts.
- 1995-1996 **Academic Excellence Scholarship.**
Awarded by Autonomous University of Coahuila to top undergraduate students.

Awards and Honors

- 06/2011 **PLDI Student Research Competition, *Second Place.***
Will participate in the Student Research Competition Grand Finals in March 2012.
- 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.
- 04/1999 **Academic Excellence in Computer Engineering Award.**
Awarded by Saltillo City. Personally received from the City Mayor.
- 04/1998 **Academic Excellence in Music Performance Award.**
Awarded by Saltillo City. Personally received from the City Mayor.

Grants

- 11/2011 NSF Scholarship to attend Grace Hopper 2011 in Portland, OR.
- 09/2011 Travel grant to attend SAS 2011 in Venice, Italy.
- 06/2011 ACM's SRC travel award to attend PLDI 2011 in San Jose, CA.

- 06/2011 PAC SIGPLAN grant to attend PLDI 2011 in San Jose, CA.
- 01/2011 Recipient of a grant for \$56,000 from Mozilla Corporation to conduct research of error propagation in the Mozilla code base.
- 09/2010 NSF Scholarship to attend the Grace Hopper Conference 2010 in Atlanta, GA.
- 06/2010 Google travel grant and PAC SIGPLAN grant to attend PASTE/PLDI 2010 in Toronto, Canada.
- 09/2009 Symantec Scholarship to attend the Grace Hopper Conference 2009 in Tucson, AZ.
- 06/2009 Google travel grant and a PAC SIGPLAN grant to attend PLDI 2009 in Dublin, Ireland.
- 03/2009 Travel grant to attend CRA-W/CDC Workshop PLOSA 2009 in Washington, D.C.
- 09/2008 Yahoo! travel grant to attend the Grace Hopper Conference 2008 in Keystone, CO.

Recent Leadership Activities

- 05/2011–Present **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 Computer Sciences 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–Present **Graduate CS Mentor, University of Wisconsin–Madison.**
Part of the WACM Mentoring program for undergraduate female students. Currently mentoring three students.
- 10/2008–Present **Member of Latinas in Computing, USA.**
A community created by and for the Latinas in computing with a mission of promoting their representation and success in computing related fields.
- 03/2009–Present **Anita Borg Institute Ambassador, USA.**
The ABI Ambassadors are 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.
- 2009 **Member of the Graduate Admissions Committee, University of Wisconsin–Madison.**
Student volunteer to review prospective graduate student applications in the Computer Sciences Department.

Other CS Activities

- 01/2012 Invited to attend the 2012 Google Graduate Researchers in Academia of Diverse backgrounds (GRAD) CS Forum, Google Inc., Mountain View, CA.
- 06/2011 Attended the CRA-W Career Mentoring Workshop, Federated Computing Research Conference (FCRC'11), San Jose, CA.
- 05/2011 External Reviewer for the ACM SIGPLAN Conference on Object Oriented Programming, Systems, Languages and Applications (OOPSLA), 2011.
- 03/2009 External Reviewer for the 6th IEEE Working Conference on Mining Software Repositories (MSR), 2009.
- 07/2007 Attended the Summer School on Language-Based Techniques for Integrating with the External World, July 18-26 2007, University of Oregon, Portland, OR.

Music Activities

- 02/2009 Offered a Solo Piano Recital as part of the requirements to obtain a Ph.D. Minor in Piano Performance, Morphy Hall, School of Music, University of Wisconsin-Madison. Performed works by Bach, Mozart, Chopin, Prokofiev and Rachmaninoff.
- 09/2006–05/2009 Advanced piano lessons with world-renowned pianist Christopher Taylor, School of Music, University of Wisconsin-Madison.
- 2001–2003 Volunteer pianist at Centrobroad Church, Milwaukee, Wisconsin.
- 1999 Performed, as part of the Solo Senior Recital, Rachmaninoff's Concerto No. 2 Op. 18 in C minor for Piano and Orchestra (under the supervision of the Russian pianist Elena Zolotova). Also performed Beethoven's Concerto No. 3 Op. 37 in C minor for Piano and Orchestra in 1998.
- 1997-2001
- Piano accompanist for the Adult's and Children's Choirs of the State of Coahuila. Offered about 30 recitals in the states of Coahuila, Puebla and Tlaxcala in Mexico.
 - Piano accompanist for the Chamber Orchestra, School of Music, Autonomous University of Coahuila. Offered recitals in the states of Coahuila and Chihuahua in Mexico.
 - Selected as one of the two pianists to perform Carmina Burana by Carl Off with the Orchestra of the state of Nuevo Leon in Mexico.
- Participated in more than 70 recitals as soloist as well as in ensembles with strings (violin, cello and guitar), woodwinds (flute and bassoon) and voice.

Personal Information

Country of Citizenship: Mexico
Visa Status: F1

References

Available upon request