

- CONTACT INFORMATION Department of Computer Science  
Columbia University  
500 West 120 Street, 515 CSB, New York, NY 10027
- Email: rg3123@columbia.edu, ronghui.gu@yale.edu  
Homepage: <http://www.guronghui.com>  
Phone: +1 (203) 430-2840  
Fax: +1 (212) 666-0140
- INTEREST Programming languages and operating systems, with a focus on language-based support for safety and security, certified system software, certified programming and compilation, formal methods, and concurrency reasoning.
- PROFESSIONAL EXPERIENCE **Columbia University** New York, NY  
*Assistant Professor* 2018 - present
- Yale University** New Haven, CT  
*Research Assistant, Associate Research Scientist* 2011 - 2017
- Working on CertiKOS, an extensible architecture for building certified OS kernels. As the lead developer of the project, verified a series of sequential and concurrent OS kernels in Coq with my Yale colleagues. The most realistic one is written in 6,500 lines of C and x86 assembly and runs on stock x86 multicore machines.
- Tsinghua University** Beijing, China  
*Research Assistant* Spring 2011
- Working on verifying the preemptive scheduling and nested interrupt handling of  $\mu\text{C}/\text{OS-II}$  running on the PowerPC platform.
- EDUCATION **Yale University** New Haven, CT  
Ph.D. in Computer Science 2011 - 2016
- Advisor: Prof. Zhong Shao
  - Thesis: An Extensible Architecture for Building Certified Sequential and Concurrent OS Kernels.
  - **Distinction Dissertation** of Yale Graduate School of Art and Science
  - Nomination for **ACM Dissertation Award**
- M.S. and M.Phil. in Computer Science 2011 - 2014
- Tsinghua University** Beijing, China  
B.S. in Computer Science 2007 - 2011
- Advisor: Prof. Yuan Dong and Prof. Shengyuan Wang
  - GPA: 91.2 / 100 Rank: 4 / 118
  - Excellent Undergraduate of Tsinghua University, **top 1.9%** (67 among 3543)
  - Honors Undergraduate Thesis of Tsinghua University, top 4% (5 among 118)
  - Excellent Undergraduate of Beijing City

SELECTED  
CONFERENCE  
PUBLICATIONS

**Certified Concurrent Abstraction Layers.**  
(with Z. Shao, J. Kim, X. Wu, J. Koenig, V. Sjöberg, H. Chen, D. Costanzo, and T. Ramanandaro)  
*Proceedings of the 39th annual ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI'18), 2018.*  
(To appear)

**An Auditing Language for Preventing Correlated Failures in the Cloud.**  
(with E. Zhai, R. Piskac, X. Lao, and X. Wang)  
*Proceedings of 32th ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA'17), 2017.*  
(Accept rate: **29%**)

**CertiKOS: An Extensible Architecture for Building Certified Concurrent OS Kernels.**  
(with Z. Shao, H. Chen, X. Wu, J. Kim, V. Sjöberg, and D. Costanzo)  
*Proceedings of the 12th USENIX Symposium on Operating Systems Design and Implementation (OSDI'16), 2016.*  
(Accept rate: **18%**)  
**Media coverage:** Yale News, International Business Times, Yale Daily News  
**Honor:** Selected in the **Research Highlights** section of the CACM.

**End-to-End Verification of Information-Flow Security for C and Assembly Programs.**  
(with D. Costanzo and Z. Shao)  
*Proceedings of the 37th annual ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI'16), 2016.*  
(Accept rate: **16%**)

**Toward Compositional Verification of Interruptible OS Kernels and Device Drivers.**  
(with C. Hao, X. Wu, Z. Shao, and J. Lockerman)  
*Proceedings of the 37th annual ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI'16), 2016.*  
(Accept rate: **16%**)

**Deep Specifications and Certified Abstraction Layers.**  
(with J. Koenig, T. Ramanandaro, Z. Shao, X. Wu, S. Weng, H. Zhang, and Y. Guo)  
*Proceedings of the 42nd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL'15), 2015.*  
(Accept rate: **23%**)

SELECTED  
PRESENTATIONS

**Introduction to CertiKOS.**  
• New England Systems Verification Day, MA Oct. 2017

**Building Fully Trustworthy OS Kernels through Formal Verification.**  
• University of Washington, WA Aug. 2017

- Chicago University, IL Apr. 2017
- University of Minnesota Twin Cities, MN Mar. 2017
- Pennsylvania State University, PA Mar. 2017
- New York University, NY Mar. 2017
- Boston University, MA Mar. 2017
- University of Connecticut, CT Feb. 2017
- Columbia University, NY Feb. 2017

#### **An Extensible Architecture for Building Certified Concurrent OS Kernels.**

- University of California, Davis, CA Dec. 2016
- Columbia University, NY Dec. 2016
- University of Pennsylvania, PA Nov. 2016
- Princeton University, NJ Nov. 2016
- OSDI, GA Nov. 2016

#### **Deep Specifications and Certified Abstraction Layers.**

- Yale Programming Languages Day, CT Nov. 2015
- New England Programming Languages and Systems Symposium June 2015
- High Confidence Software and Systems Conference, Maryland May 2015
- POPL, Mumbai, India Jan. 2015

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| SELECTED<br>HONORS         | Distinction Dissertation, Yale University  | Dec. 2016 |
|                            | Nomination for ACM Dissertation Award, Yale University   | Aug. 2016 |
|                            | Robert Willets Carle Scholarship, Yale University  | Feb. 2016 |
|                            | Excellent Undergraduate (top 1.9%), Tsinghua University  | Jul. 2011 |
|                            | Excellent Undergraduate of Beijing City  | Jul. 2011 |
|                            | Honors Undergraduate Thesis (top 4%), Tsinghua University  | Jul. 2011 |
|                            | Sohu Scholarship, Tsinghua University  | Oct. 2010 |
|                            | Ticket Master Scholarship, Tsinghua University   | Oct. 2009 |
|                            | First Prize of National Mathematical Olympiad Competition, China   | Oct. 2006 |
| PROFESSIONAL<br>ACTIVITIES | Member of Program Committee, <i>the 16th USENIX Symposium on Networked Systems Design and Implementation (NSDI)</i> , 2019.                        |           |
|                            | Member of Program Committee, <i>the 2018 IEEE Security Development Conference (SecDev)</i> , 2018.   |           |
|                            | Member of External Review Committee, <i>39th annual ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI'18)</i> , 2018. |           |
|                            | Reviewer for <i>Transactions on Computers, IET Software, Science China Information Sciences, FMAT'17, TACAS'15</i> . 2015 - present.               |           |
|                            | Member of CPS-VO. 2015 - present.  |           |

TEACHING EXPERIENCE      **Assistant Professor** at Columbia University      Spring 2018 - present

- COMS E6998 Formal Verification of System Software (Fall 2018)
- COMS W3101 Programming Languages (Python) (Spring 2018)

**Teaching Assistant** at Yale University      Fall 2012 - Fall 2015

- CPSC 422/522 Operating System Design and Implementation (Fall 2015)  
Instructor: Prof. Zhong Shao
- CPSC 458/558 Automatic Decision Systems (Fall 2015)  
Instructor: Dr. Stephen Slade
- CPSC 439/539 Software Engineering (Spring 2015 and Spring 2014)  
Instructor: Prof. Ruzica Piskac
- CPSC 424/524 Parallel Programming Techniques (Fall 2014 and Fall 2013)  
Instructor: Dr. Andrew Sherman
- CPSC 112 Introduction to Programming Languages (Spring 2013 and Fall 2012)  
Instructor: Prof. Drew V. McDermott and Prof. Daniel Abadi

CITIZENSHIP      Peoples Republic of China