

# Ruoyu (Fish) Wang

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## Education

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### **Ph.D. candidate in Computer Science**

University of California, Santa Barbara

*Expected Jun. 2018*

**Areas of study:** Computer and Information Security.

**Research interests:** Static analysis and symbolic execution on COTS binaries

**Advisors:** Professor Dr. Giovanni Vigna and Professor Dr. Christopher Kruegel

### **Bachelor of Engineering in Computer Software**

Tsinghua University, China

*Sep. 2009 – Jun. 2013*

## Publications

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### **Summary**

*8 publications (2 first-authors, 3 second-authors) in top-tier security conferences (Oakland, USENIX, NDSS, and CCS).*

### **Refereed Conference Proceedings**

- Rise of the HaCRS: Augmenting Autonomous Cyber Reasoning Systems with Human Assistance**  
Yan Shoshitaishvili, Michael Weissbacher, Lukas Dresel, Christopher Salls, Ruoyu Wang, Christopher Kruegel, and Giovanni Vigna  
In *Proceedings of the ACM Conference on Computer and Communications Security (CCS '17)*, ACM, 2017
- How Shall We Play a Game? A Game-Theoretical Model for Cyber-warfare Games.**  
Tiffany Bao, Yan Shoshitaishvili, Ruoyu Wang, Christopher Kruegel, Giovanni Vigna, and David Brumley  
In *Proceedings of IEEE Computer Security Foundation Symposium (CSF '17)*, IEEE, 2017
- Ramblr: Making Reassembly Great Again.**  
Ruoyu Wang, Yan Shoshitaishvili, Antonio Bianchi, Aravind Machiry, John Grosen, Paul Grosen, Christopher Kruegel, and Giovanni Vigna  
In *Proceedings of Network and Distributed System Security Symposium 2017 (NDSS '17)*, Internet Society, 2017.  
\* **Won Distinguished Paper Award**
- BOOMERANG: Exploiting the Semantic Gap in Trusted Execution Environments.**

- Aravind Machiry, Eric Gustafson, Chad Spensky, Christopher Salls, Nick Stephens, Ruoyu Wang, Antonio Bianchi, Yung Ryn Choe, Christopher Kruegel, and Giovanni Vigna  
In *Proceedings of Network and Distributed System Security Symposium 2017 (NDSS '17)*, Internet Society, 2017.
5. **Your Exploit is Mine: Automatic Shellcode Transplant for Remote Exploits.**  
Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, and David Brumley  
In *Proceedings of IEEE Symposium on Security and Privacy (Oakland '17)*, IEEE, 2017
  6. **(State of) The Art of War: Offensive Techniques in Binary Analysis.**  
Yan Shoshitaishvili, Ruoyu Wang, Christopher Salls, Nick Stephens, Mario Polino, Andrew Dutcher, John Grosen, Siji Feng, Christophe Hauser, Christopher Kruegel, and Giovanni Vigna  
In *Proceedings of IEEE Symposium on Security and Privacy (Oakland '16)*, IEEE, 2016.
  7. **Driller: Augmenting Fuzzing Through Selective Symbolic Execution.**  
Nick Stephens, John Grosen, Christopher Salls, Andrew Dutcher, Ruoyu Wang, Jacopo Corbetta, Yan Shoshitaishvili, Christopher Kruegel, and Giovanni Vigna  
In *Proceedings of the Network and Distributed System Security Symposium (NDSS '16)*, Internet Society, 2016.
  8. **Firmalice - Automatic Detection of Authentication Bypass Vulnerabilities in Binary Firmware.**  
Yan Shoshitaishvili, Ruoyu Wang, Christophe Hauser, Christopher Kruegel, and Giovanni Vigna  
In *Proceedings of the Network and Distributed System Security Symposium (NDSS '15)*. Internet Society, 2015.
  9. **Steal This Movie: Automatically Bypassing DRM Protection in Streaming Media Services.**  
Ruoyu Wang, Yan Shoshitaishvili, Christopher Kruegel, and Giovanni Vigna  
In *Proceedings of the 22nd USENIX conference on Security (USENIX '13)*. USENIX Association, 2013.  
\* Nominated as a finalist in CSAW Best Applied Research Paper Award 2013
  10. **De-obfuscation and Detection of Malicious PDF Files with High Accuracy.**  
Xun Lu, Jianwei Zhuge, Ruoyu Wang, Yinzhi Cao, and Yan Chen  
In *Proceedings of 46th Hawaii International Conference on System Sciences (HICSS '13)*. IEEE, 2013.

## Refereed Journal Articles

1. **Mechanical Phish: Resilient Autonomous Hacking**  
Yan Shoshitaishvili, Kevin Borgolte, Antonio Bianchi, Jacopo Corbetta, Francesco Disperati, Andrew Dutcher, John Grosen, Paul Grosen, Aravind Machiry, Giovanni Vigna, Ruoyu Wang  
To appear in *IEEE Security & Privacy Magazine – SPSI: Hacking without Humans*. IEEE, 2017

## Professional Activities

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### Workshop Co-chair

- The Workshop on Binary Analysis Research (BAR) .....2018

## Program Committee

- Security Track of ACM SIGAPP Symposium on Applied Computing (SAC).....2016 – 2018

## External Reviewer

- Network and Distributed System Security Symposium (NDSS) .....2017
- USENIX Security Symposium (USENIX) .....2015

## Presentations, Talks, and Tutorials

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### On angr and binary analysis

- **angr – The Next Generation of Binary Analysis**.....Sep. 2017  
IEEE Cybersecurity Development Conference (IEEE SecDev '17), Boston
- **Making Binary Analysis Easier with angr** .....Mar. 2017  
Institute of Information Engineering at China Academy of Science, Beijing, China
- **angr – Advancing Next Generation Research into Binary Analysis** .....Dec. 2016  
Annual Computer Security Applications Conference (ACSAC '16), Los Angeles
- **Angry Hacking** .....Apr. 2016  
OCON, Shanghai, China
- **Angry Hacking** .....Apr. 2016  
Sichuan University, Chengdu, China
- **Angry Hacking – The Next Generation of Binary Analysis** .....Aug. 2015  
DEF CON 23, Las Vegas

### On Cyber Grand Challenge

- **Stories Behind the Shellphish CGC Team**.....Oct. 2016  
InForSec Forum, Beijing, China
- **Cyber Grand Shellphish** .....Aug. 2016  
DEF CON 24, Las Vegas

## Teaching Experience

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- Teaching assistant, *Advanced Topics in Computer Security* (CS279 at UCSB).....Fall 2017
- Teaching assistant, *Translation of Programming Languages* (CS160 at UCSB).....Fall 2016
- Teaching assistant, *Advanced Topics in Computer Security* (CS279 at UCSB).....Fall 2015

## Other Experience

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- Co-founder and core developer of the binary analysis platform *angr*.....since 2013
- Core player of CTF team Shellphish.....since 2013
- Core player of CTF team Blue-Lotus.....2010 – 2013

## Awards

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### Academic

- Outstanding Publication Award.....May. 2017  
Computer Science Department of University of California, Santa Barbara
- Distinguished Paper Award .....Feb. 2017  
Network and Distributed System Security Symposium 2017 (NDSS '17)
- Nominated as a finalist in CSAW Best Applied Research Paper Award .....Oct. 2013

### Cybersecurity

- Third Place, Application Security Competition at CyberSEED (team tos).....Nov. 2017
- Fourth Place, HITCON CTF 2016 Finals (team Shellphish) .....Dec. 2016
- Second Place, BuildItBreakIt Cybersecurity Competition (team tos) .....Nov. 2016
- Third Place, DARPA Cyber Grand Challenge Final Event (team Shellphish).....Aug. 2016  
Shellphish is the top-ranked Open Track team and the top-ranked Academic Team, won \$750,000
- Fourth Place, OCTF 2016 Finals (team Shellphish) .....Apr. 2016

## References

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### Dr. Giovanni Vigna

Professor, UC Santa Barbara  
[vigna@cs.ucsb.edu](mailto:vigna@cs.ucsb.edu)  
PhD Advisor

### Dr. Christopher Kruegel

Professor, UC Santa Barbara  
[chris@cs.ucsb.edu](mailto:chris@cs.ucsb.edu)  
Co-PhD Advisor

### Dr. David Brumley

Professor, Carnegie Mellon University  
[dbrumley@cmu.edu](mailto:dbrumley@cmu.edu)  
Research Internship Mentor

### Dr. Weidong Cui

Principal Researcher, Microsoft Research  
[Weidong.Cui@microsoft.com](mailto:Weidong.Cui@microsoft.com)  
Research Internship Mentor