

# CRISTIAN ZAMFIR

cristi@cyberhaven.io  
<http://dslab.epfl.ch/people/zamfir>

I am currently a co-founder and COO at Cyberhaven, a stealth-mode security startup developing a radical new way to ensure the safety and security of IT assets.

## INTERESTS

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I am passionate about building secure and reliable systems.

## EDUCATION

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- Post-doctoral researcher, Ecole Polytechnique Fédérale de Lausanne** Switzerland *2013–2014*  
Developed an automated testing service to find high-impact security vulnerabilities in binary software.
- Ph.D. in Computer Science, Ecole Polytechnique Fédérale de Lausanne** Switzerland *2008–2013*  
Thesis: Execution Synthesis: A Technique for Automating the Debugging of Software  
Advisor: Prof. George Candea
- M.Sc. by Research in Computer Science, University of Glasgow** UK *2006–2007*  
Thesis: Live Migration of User Environments Across Wide Area Networks  
Advisors: Dr. Peter Dickman and Dr. Colin Perkins
- B.Eng., University Politehnica of Bucharest (UPB)** Romania *2000–2005*  
Thesis: Security and Trust Management in Distributed Recommender Systems  
Advisors: Prof. Wolfgang Nejdl and Prof. Valentin Cristea

## WORK EXPERIENCE

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- Co-founder and COO, Cyberhaven Inc.** *2014–present*  
Developing a radical new way to ensure the safety and security of IT assets while enabling organizations as well as individuals to achieve total IT security while preserving their productivity.
- Post-doctoral Research Assistant, EPFL** Lausanne, Switzerland *2013–2014*  
Developed components of a system to automatically find high-impact security vulnerabilities in binary software. Set the grounds for a technology transfer from EPFL to CodeTickler.
- Research Assistant, EPFL** Lausanne, Switzerland *2008–2014*  
Developed execution synthesis, a technique for automated debugging, that can reproduce concurrency and memory safety bugs starting from just a bug report, in just a few minutes.
- Visiting Researcher, University of California, Berkeley** Berkeley, USA *2010–2011*  
Developed together with with Prof. Ion Stoica and Gautam Altekar a system for replay-debugging data-center applications. We also defined and proposed ways to achieve “debug determinism”, the sweet spot between runtime recording overhead and replay fidelity for replay debugging systems.
- Research Intern, Microsoft Research** Cambridge, UK *2007*  
Developed and analyzed various parts of a background transfer service, a receiver-side controller designed to detect and reduce the interference of background traffic on normal priority TCP flows.

- Research Assistant, New Jersey Institute of Technology** Newark, NJ *2016*  
 Developed a hybrid routing protocol for vehicular networks that aims to reduce routing overhead and improve TCP performance.
- Research Intern, L3S Research Center** Hanover, Germany *2005*  
 Developed metrics for identifying shilling attacks in distributed recommender systems and an algorithm that prevents large groups of shilling attackers from interfering with a recommender system.
- Research Assistant, National Center for Information Technology** Bucharest, Romania *2003–2005*  
 Developed an efficient electronic cash platform for smartphones based on Merkle Hash Trees and symmetric cryptography.  
 Developed an autonomous robot for motion detection-based video surveillance.

## PROFESSIONAL SERVICE

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### Member of Program Committees

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| BigDataCloud – Intl. Workshop on Big Data Management in Clouds                 | 2014 |
| DSN Student Forum – Dependable Systems and Networks                            | 2014 |
| BigDataCloud – Intl. Workshop on Big Data Management in Clouds                 | 2013 |
| CloudCP – Intl. Workshop on Cloud Computing Platforms                          | 2012 |
| SFMA – Intl. Workshop on Systems for Future Multi-core Architectures           | 2012 |
| CloudCP – Intl. Workshop on Cloud Computing Platforms                          | 2011 |
| NBiS – Intl. Conference on Network-Based Information Systems                   | 2011 |
| DOLAP – ACM Intl. Workshop On Data Warehousing and OLAP                        | 2010 |
| 3PGCIC – Intl. Conference on P2P, Parallel, Grid, Cloud and Internet Computing | 2010 |

### Journal Reviewer

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|---|------|
| IEEE Transactions on Software Engineering         | 2014 |
| IEEE Transactions on Reliability                  | 2014 |
| IEEE Software                                     | 2014 |
| ACM Computing Reviews (member of)                 | 2014 |
| JSEP – Journal of Software: Evolution and Process | 2012 |

### ShadowPC Committee Member

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| EuroSys–ACM SIGOPS/EuroSys European Conference on Computer Systems | 2010 |
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### External Reviewer

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| OSDI – USENIX Symposium on Operating Systems Design and Implementation                           | 2014             |
| CIDR – Conference on Innovative Data Systems Research  | 2013             |
| SOCC – ACM Symposium on Cloud Computing  | 2012             |
| EuroSys – ACM SIGOPS/EuroSys European Conference on Computer Systems                             | 2009, 2011, 2012 |
| SOSP – Symposium on Operating Systems Principles   | 2011             |
| USENIX Annual Technical Conference   | 2011             |
| SPIN – Intl. SPIN Workshop on Model Checking of Software   | 2011             |
| ASPLOS – ACM Conference on Architectural Support for Programming Languages and Operating Systems | 2010             |

## ENTREPRENEURSHIP TRAINING

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| <b>Technology Ventures in IT, semester course, EPFL</b> Lausanne, Switzerland        | <i>2014</i> |
| <b>CTI Business Creation, one week intensive course</b> Lausanne, Switzerland        | <i>2014</i> |
| <b>Swiss Venture Leaders, two weeks intensive course, Babson College</b> Boston, USA | <i>2013</i> |
| <b>Venture Challenge, semester course, EPFL</b> Lausanne, Switzerland                | <i>2013</i> |

- [1] Automated Classification of Data Races for Both Strong and Weak Memory Models. Baris Kasikci, Cristian Zamfir, and George Candea. *ACM Transactions of Programming Languages and Systems (TOPLAS)*, May 2015.
- [2] RaceMob: Crowdsourced Data Race Detection. Baris Kasikci, Cristian Zamfir, and George Candea. *Symp. on Operating Systems Principles*, Farmington, PA, November 2013.
- [3] Automating the Debugging of Datacenter Applications with ADDA. Cristian Zamfir, Gautam Altekar, George Candea, and Ion Stoica. *Intl. Conf. on Dependable Systems and Networks*, Budapest, June 2013.
- [4] Reconstructing Core Dumps. Jeremias Rökler, Andreas Zeller, Gordon Fraser, Cristian Zamfir, and George Candea. *Intl. Conf. on Software Testing Verification and Validation (ICST)*, Luxembourg, March 2013.
- [5] Data Races vs. Data Race Bugs: Telling the Difference with Portend. Baris Kasikci, Cristian Zamfir, and George Candea. *Intl. Conf. on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, London, UK, March 2012.
- [6] Parallel Symbolic Execution for Automated Real-World Software Testing. Stefan Bucur, Vlad Ureche, Cristian Zamfir, and George Candea. *ACM EuroSys European Conf. on Computer Systems (EUROSYS)*, Salzburg, Austria, April 2011.
- [7] Low-Overhead Bug Fingerprinting for Faster Debugging. Cristian Zamfir and George Candea. *Intl. Conf. on Runtime Verification (RV)*, Malta, November 2010.
- [8] Automated Software Testing as a Service. George Candea, Stefan Bucur, and Cristian Zamfir. *Symp. on Cloud Computing (SOCC)*, Indianapolis, IN, June 2010.
- [9] Execution Synthesis: A Technique for Automated Debugging. Cristian Zamfir and George Candea. *ACM EuroSys European Conf. on Computer Systems (EUROSYS)*, Paris, France, April 2010.
- [10] Deadlock Immunity: Enabling Systems To Defend Against Deadlocks. Horatiu Jula, Daniel Tralamazza, Cristian Zamfir, and George Candea. *Symp. on Operating Sys. Design and Implem. (OSDI)*, San Diego, CA, December 2008.
- [11] An Efficient Electronic Cash Platform for Smart Phones. Cristian Zamfir, Ionut Constandache, Andrei Damian, and Valentin Cristea. *E-COMM-LINE International Conference*, Bucharest, Romania, 2004.
- [12] Implementing the IMS Question and Test Interoperability Specification: An Architectural Overview. Cristian Zamfir, Ionut Constandache, and Octavian Udrea. *E-COMM-LINE International Conference*, Bucharest, Romania, 2003.

PEER-REVIEWED WORKSHOP PUBLICATIONS

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- [13] CodeTickler: Automated Software Testing as a Service. Cristian Zamfir. *Workshop on High Performance Transaction Systems (HPTS)*, Pacific Grove, CA, September 2013.
- [14] Automated Debugging for Arbitrarily Long Executions. Cristian Zamfir, Baris Kasikci, Johannes Kinder, Edouard Bugionon, and George Candea. *Workshop on Hot Topics in Operating Systems (HOTOS)*, Santa Ana Pueblo, NM, May 2013.
- [15] CoRD: A Collaborative Framework for Distributed Data Race Detection. Baris Kasikci, Cristian Zamfir, and George Candea. *Workshop on Hot Topics in Dependable Systems (HOTDEP)*, Hollywood, CA, October 2012.

- [16] Debug Determinism: The Sweet Spot for Replay-based Debugging. Cristian Zamfir, Gautam Altekar, George Candea, and Ion Stoica. *Workshop on Hot Topics in Operating Systems (HOTOS)*, Napa, CA, May 2011.
- [17] Cloud9: A Software Testing Service. Liviu Ciortea, Cristian Zamfir, Stefan Bucur, Vitaly Chipounov, and George Candea. *Workshop on Large Scale Distributed Systems and Middleware*, Big Sky, MT, October 2009.
- [18] Selective Symbolic Execution. Vitaly Chipounov, Vlad Georgescu, Cristian Zamfir, and George Candea. *Workshop on Hot Topics in Dependable Systems (HOTDEP)*, Cascais, Portugal, June 2009.
- [19] Preventing Shilling Attacks in Online Recommender Systems. Paul-Alexandru Chirita, Wolfgang Nejdl, and Cristian Zamfir. *ACM International Workshop on Web Information and Data Management (WIDM)*, Bremen, Germany, 2005.

## INVITED TALKS

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1. “A Testing Service for Software Binaries” at *The 30th CREST Open Workshop: Search Based Software Testing and Dynamic Symbolic Execution*, at University College, London, 2014
2. “A Testing Service for Software Binaries” at *Royal Holloway University of London*, 2014
3. “Classifying Data Races with Portend” at *Microsoft ICES Workshop*, Cambridge, UK, 2012
4. “Classifying Data Races with Portend” at *Imperial College, London, UK*, 2012
5. “Execution Synthesis: A technique for Automated Debugging” at *U.C. Berkeley, CA*, 2010
6. “Execution Synthesis: A technique for Automated Debugging” at *Intel Research, Berkeley, CA*, 2010

## TALKS AT PEER-REVIEWED CONFERENCES AND WORKSHOPS

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1. “CodeTickler: Automated Software Testing as a Service” at the *Workshop on High Performance Transaction Systems (HPTS)*, Pacific Grove, CA, 2013.
2. “Automating the Debugging of Datacenter Applications with ADDA” at the *Conference on Dependable Systems and Networks (DSN)*, Budapest, Hungary, 2013.
3. “Automated Debugging for Arbitrarily Long Executions” at the *Workshop on Hot Topics in Operating Systems (HotOS)*, Santa Ana Pueblo, NM, 2013.
4. “Debug Determinism: The Sweet Spot for Replay-based Debugging” at the *Workshop on Hot Topics in Operating Systems (HotOS)*, Napa, CA, 2011.
5. “Execution Synthesis: A Technique for Automated Debugging” at the *European Conf. on Computer Systems (EuroSys)*, Paris, France, 2010.
6. “Low-Overhead Bug Fingerprinting for Faster Debugging” at the *Intl. Conf. on Runtime Verification (RV)*, Malta, 2010.
7. “Selective Symbolic Execution” at the *Workshop on Hot Topics in Dependable Systems (HotDep)*, Cascais, Portugal, 2009.
8. “An Efficient Electronic Cash Platform for Smart Phones” at the *E-COMM-LINE International Conference*, Bucharest, Romania, 2004.

## PATENTS

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- *Automatic Generation of Program Execution that Reaches a Given Failure Point*, Cristian Zamfir and George Candea, US Patent No. 8,966,453 (Feb 15, 2015)
- *Parallel symbolic execution on cluster of commodity hardware*, Stefan Bucur, Cristian Zamfir, and George Candea, US Patent No. 8,863,096 (Oct 14, 2014)

## AWARDS

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<b>Innigrant</b> – recipient of \$100'000 funding to work on EPFL technology transfer.	2013
<b>Open Source Software World Challenge</b> – Gold Medal with the Cloud9 project.	2013
<b>Intel Doctoral Student Honor Programme</b> – recipient of \$35,000 Intel award	2012
<b>Faculty Scholarship</b> – University of Glasgow	2006
<b>Overseas Research Scholarship</b> – University of Glasgow	2006
<b>Merit Scholarship (top 5% of my class)</b> – University Politehnica of Bucharest	2001–2005
<b>2nd prize in UPB Annual Project Competition</b> – Advanced Remote Surveillance System	2004
<b>3rd prize in the National Mathematics Olympiad</b> – Romania	2000
<b>2nd prize in the National Mathematics Olympiad</b> – Romania	1999
<b>1st prize in National Mathematics Summer Camp</b> – Romania	1998
<b>Silver Medal in International Mathematics Project Competition</b> – Turkey	1998
<b>1st prize in the National Mathematics Olympiad</b> – Romania	1996
<b>2nd prize in the National Mathematics Olympiad</b> – Romania	1995

## TEACHING

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<b>Software Engineering</b> (3 <sup>rd</sup> year undergraduate level at EPFL)	
Teaching assistant	2008–2012
<b>Software Systems for Computer Networks</b> (5 <sup>th</sup> year undergraduate level at UPB)	
Teaching assistant	2005
<b>Co-supervised M.Sc. thesis</b> (Hanover University)	2005
Title: “Distributed Recommender Systems”, student Jurgen Belizki	
<b>Co-supervised M.Sc. thesis</b> (Masaryk University)	2012
Title: “Execution Synthesis: Formal Description and Core Dump Interface”, student Martin Milata	

## ADDITIONAL QUALIFICATIONS

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<b>4th International School on Foundations of Security Analysis and Design</b>	2004
<b>Cisco Networks</b> – taken 2 semesters of CCNA courses	2003
<b>IBM WebSphere Application Server Development Workshop</b>	2003

## UNDERGRADUATE ACADEMIC PROJECTS

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<b>Device Drivers</b>	2004
Linux and Windows device drivers for serial port, firewall, and virtual disk drive.	
<b>Robot online searching in star-shaped polygons.</b>	2002

## MISCELLANEOUS

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### **Interests**

Playing guitar and singing  
Photography  
Rock climbing  
Table tennis  
Cycling

### **Languages**

English (fluent)  
Spanish (fair)  
Romanian (mother tongue)  
French (beginner)