Jon Stephens

Computer Science Applicant
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Education

◇ August 2018 - Present
The University of Texas at Austin — Austin, TX
Ph.D. in Computer Science

◇ August 2016 - August 2018
The University of Arizona (GPA: 4.0) — Tucson, AZ
M.S. in Computer Science — August 2018

◇ August 2011 - May 2016
The University of Arizona (GPA: 3.949) — Tucson, AZ
B.S. in Computer Science with Honors, *summa cum laude* — May 2016
B.S. in Electrical & Computer Engineering with Honors, *summa cum laude* May 2016

Research Experience

◇ **Covert Collusion Detection** — August 2017 - May 2018
Supervisor: Dr. Saumya Debray of the Department of Computer Science

- Aimed at statically analyzing android applications to determine if they have the potential to collude through overt or covert channels.

◇ **Language-Agnostic Interpreter Optimization** — July 2016 - August 2018
Supervisors: Dr. Saumya Debray, Dr. Michelle Strout and Dr. Kate Isaacs of the Department of Computer Science

- Currently aiding in the creation of a dynamic program analysis toolset capable of taking and analyzing traces of program containing signals, dynamic modification and multithreading. Our work on the creation of dynamic control flow graphs has led to a talk at WODA [4], and we are currently writing a paper on the same topic. The goal of the research effort is to eventually provide dynamic specialization and optimization of interpreted programs.

◇ **Obfuscation with Covert Channels** — July 2016 - July 2017
Supervisors: Dr. Saumya Debray and Dr. Christian Collberg of the Department of Computer Science

- Aided in the development of a framework that obfuscates data flows in a program using covert channels, allowing them to exfiltrate information without being detected. This led to a talk at the International Workshop on Obfuscation and a paper that will appear in the 3rd European Symposium on Security and Privacy (EuroS&P) [3].

◇ **Analysis of Exception-Based Control Transfers** — February 2016 - September 2016
Supervisor: Dr. Saumya Debray of the Department of Computer Science

- Developed a query caching mechanism for an SMT solver in a symbolic analysis tool aimed at discovering additional execution paths through exception handlers [2].

◇ **Malware Detection Evasion** — July 2015 - July 2016
Supervisor: Dr. Saumya Debray of the Department of Computer Science

- Investigated techniques used by modern malware to evade detection by modern tools. This was done by looking at runtime traces of malware samples and developing tools that identify control flow transfers based off of environmental inputs (such as time, date, user input, etc.).

Work Experience

◇ **Student Programmer** — July 2013 - July 2016
The High Resolution Imaging Science Experiment (HiRISE)
Tucson, Arizona

- Involved programming scientific tools and applications. Responsibilities included creating and modifying features for HiView, an image view capable of rendering high resolution JPEG 2000 images as well as programming various scientific tools necessary to process images taken by the Mars Reconnaissance Orbiter.

◇ **IT Support Student** June 2012 - June 2015
The University of Arizona Risk Management and Services Department
Tucson, Arizona

- I supported the staff of the University of Arizona's Risk Management and Services Department. Responsibilities include fixing and updating computers, managing the backup of the local server, updating the website, troubleshooting computer hardware/software issues and imaging hard drives.

◇ **Undergraduate Lab Assistant for Fundamentals of Computer Architecture (ECE 369)** August 2013 - December 2013
The University of Arizona Electrical and Computer Engineering Department

- Helped the students of ECE 369 debug and understand their laboratory assignments. In this lab, students were required to implement a datapath in Verilog and test it using Field-Programmable Gate Arrays (FPGAs). Responsibilities included holding office hours, communicating and aiding students with their lab assignments, and maintaining an expertise in Verilog as well as datapath design.

Peer-Reviewed Publications

1. Jon Stephens, Babak Yadegari, Christian Collberg, Saumya Debray, Carlos Scheidegger. Probabilistic Obfuscation through Covert Channels. *In Proceedings of the 3rd IEEE European Symposium on Security and Privacy (EuroS&P)*. 2018.
2. Michelle Mills Strout, Saumya Debray, Kate Isaacs, Barbara Kreaseck, Julio Cárdenas-Rodríguez, Bonnie Hurwitz, Kat Volk, Sam Badger, Jesse Bartels, Ian Bertolacci, Sabin Devkota, Anthony Encinas, Ben Gaska, Brandon Neth, Theo Sackos, Jon Stephens, Sara Willer, Babak Yadergari. Language-Agnostic Optimization and Parallelization for Interpreted Languages. *In Proceedings of the 30th Workshop on Languages and Compilers for Parallel Computing (LCPC)*. 2017.
3. Babak Yadegari, Jon Stephens, Saumya Debray. Analysis of Exception-Based Control Transfers. *In Proceedings of the 7th ACM Conference on Data and Application Security and Privacy (CODASPY)*. 2017.

Other Publications

4. Jesse Bartels, Jon Stephens, Saumya Debray. Constructing Dynamic Control Flow Graphs from Execution Traces. *The International Workshop on Dynamic Analysis (WODA)*. 2017.
5. Aaron Kilgallon, Jon Stephens, Sarah Sutton and Joel Mueting. AutoTriangulation: A New Tool for Controlling Stereo Pairs to Laser Altimetry. *Published abstract for Lunar and Planetary Science Conference*. 2015.

Talks

◇ Probabilistic Obfuscation through Covert Channels. *The 3rd IEEE European Symposium on Security and Privacy*. London, United Kingdom. April 2018.

◇ Hiding Data Flows with Covert Channels. *International Workshop on Obfuscation*. New York University. New York City, New York. April 2017.

Awards

◇ Provost's Graduate Excellence Fellowship (August 2018)

◇ Department of Computer Science Outstanding Graduate Scholar (May 2018)

◇ Galileo Circle Scholarship (May 2017)

◇ ECE Undergraduate Scholarship (Fall 2015 - Spring 2016)

◇ Smith-Mincks Scholarship (Fall 2014 - Spring 2015)

◇ Academic Year Highest Academic Distinction (Fall 2013 Spring 2014, Fall 2014 - Spring 2015)

◇ Academic Year Academic Distinction (Fall 2011 - Spring 2012, Fall 2012 Spring 2013)

- ◇ Dean's List Honorable Mention (Spring 2015, Fall 2015, Spring 2016)
- ◇ Deans List with Distinction (Spring 2012, Spring 2013, Fall 2013, Spring 2014, Fall 2014)
- ◇ Deans List (Fall 2011, Fall 2012)
- ◇ Presidents Education Award for Outstanding Academic Excellence (Spring 2011)
- ◇ Board of Regents Wildcat Excellence Award (Spring 2011)