YIZHUO ZHAI

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EDUCATION

Xidian University *Xian, Shaanxi Province, P.R. China (Sept 2012 - June 2016)*

BS in Software Engineering GPA: 3.82/4.0, 91/100 (ranked 1st)
University of Limerick (Study Abroad) *Ireland (Sept 2015 - June 2016)*

University of California Riverside *Riverside, CA (Sept 2016 - Present)*

PhD candidate Co-advised by Srikanth V. Krishnamurthy and Zhiyun Qian
Computer Science Overall GPA: 3.92/4.00 Expected Grad: June 2021

TECHNICAL STRENGTHS

Computer Languages(In order of strength): C++, C, Java, Python, Swift, Shell Script
Software & Tools LLVM, Linux, Clang, Hadoop

PROJECTS

UBITECT Sept 2016 - Aug 2019
Research Project

- Created a static analysis tool detecting use-before-initialization (UBI) bugs scaling to the whole Linux kernel in LLVM IR level.
- This is the first work to do inter-procedural analysis targeting at the use of uninitialized variables.
- Successfully find 138 new UBI bugs in Linux kernel.

LLVMCookBook April 2019 - Aug 2019

- Established a llvm front end for the self-defined language in LLVMCookBook, registered new optimization passes in IR level.
- Refer, update and test the code in the book to be compatible with LLVM 7.0.0.
- Became more familiar with LLVM. While further understood how compiler front end, optimizer and back end works. (Github:`https://github.com/YizhuoZhai/LLVMCookBook`)

Cat Classifier June 2019
Deep Learning Project

- Applied **Logistic Regression**, **Two-layer Neural Networks** and **L-layer Neural Networks** to classify the cat vs. non-cat.
- Reach an accuracy of 80% by using L-layer Neural Networks.

Router Malware Clustering Sept 2017 - Dec 2017
Data Mining Class Project

- Clustering different kinds of router malware based on their execution trace.
- Two distinguished features are: the system call times and the memory usage over time, **dynamic time wrapping** is used to deal with the second feature.
- Eight clusters are calculated via the algorithm.

CTF Style Binary Exploits Jan 2017 - Mar 2017
Security Lab

- The lab required student to understand both offensive techniques (e.g., how exploit works) and the defensive techniques (e.g., how to patch a vulnerability).
- Topics included stack overflow, heap overflow, format string, return oriented programming, etc. (Schedule:`https://www.cs.ucr.edu/~csong/seclab/17/cal.html`)
- Solved 80/100 challenges within 10 weeks.

TowelRoot Sept 2016 - Dec 2016

OS Class Project

- Fully understand CVE-2014-3153 and can utilize it to compromise an Android device.
- CVE-2014-3153 shows some flaw when using Linux data structure. The logic is hard to understand while the proof of concept (PoC) is non-trivial.
- Get the root privilege of an Android device within 1 minutes.

NOTABLE AWARDS

09/2016 Deans Distinguished Fellowship
06/2016 Presidents Volunteer Award (Bronze)
04/2015 First Prize Scholarship by college
10/2014 National Scholarship
05/2014 Third Prize in the 12th Huawei Cup Programming Competition
10/2014 Special Scholarship by college
10/2013 First Prize Scholarship by college
03/2013 Special Scholarship by college