

YIZHUO ZHAI

900 University Ave, Riverside, CA 92521

(+1) 951 476 6303 ♦ yizhuo dot zhai at email dot ucr dot edu

EDUCATION

Xidian University	<i>Xian, Shaanxi Province, P.R. China (Sept 2012 - June 2016)</i>
BS in Software Engineering	GPA: 3.82/4.0, 91/100 (ranked 1st)
University of Limerick (Study Abroad)	<i>Ireland (Sept 2015 - June 2016)</i>
University of California Riverside	<i>Riverside, CA (Sept 2016 - Present)</i>
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

IncAnalyzer <i>Research Project</i>	Sept 2019 - Current
<ul style="list-style-type: none">Incremental analysis for Linux kernel.We are building a framework to enable the incremental analysis across different versions of Linux kernel.	
UBITECT <i>Research Project</i>	Sept 2016 - Aug 2019
<ul style="list-style-type: none">Created a static analysis tool detecting use-before-initialization (UBI) bugs scaling to the whole Linux kernel in LLVM IR level.This is a work to do inter-procedural/inter-module analysis targeting at the use of uninitialized variables.Successfully find 138 new UBI bugs in Linux kernel, 52 bugs are confirmed.	
LLVMCookBook	April 2019 - Aug 2019
<ul style="list-style-type: none">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 <i>Deep Learning Project</i>	June 2019
<ul style="list-style-type: none">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 <i>Data Mining Class Project</i>	Sept 2017 - Dec 2017
<ul style="list-style-type: none">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 <i>Security Lab</i>	Jan 2017 - Mar 2017

- 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.

SELECTED VOLUNTEER WORK

UCR MESA

Sept 2017 - Current

I currently work as a volunteer for the UCR MESA (<https://mesa.engr.ucr.edu>) events. I mainly help with the middle school and high school technique competitions.

- 6/2018 GEMS(Girls Excelling in Mathematics and Succeeding) events: Student Organizer
- 3/2018 2018 Seaperch Competition: Runner
- 2/2018 MESA Day: Judge for High School NEDC (National Engineering Design Competition)
- 11/2017 MESA Robotics Invitational: High School Judge

SELECTED CLASSES

System:	Advanced OS, Program Verification, Advanced Compiler Construction, Computer Security
AI:	Machine Learning, Data Mining, Artificial Intelligence, Probablistic Module of AI

NOTABLE AWARDS

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