ZHIYU ZHANG

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EDUCATION

Huazhong University of Science and Technology   *Sep 2017 - Present*
School of Electric Information and Communications   Junior Undergraduate
Third-year GPA: 90.5/100   Rank: 2/26

RESEARCH EXPERIENCE

Research of Intrusion Detection/Prevention System for APTs   Sep 2019 - Present
Advisor: Associate Professor Guihui Zhong and Chengwei Zhang   *Dian Group, HUST, Wuhan*

· Proposed a Fast Recoverable System for Cyber Range in order to conduct destructive experiments efficiently. (Oral presentation on IEEE ICTC 2020)
· Analyzed the execution principles of malware based on reverse engineering — e.g. WannaCry would scan 445 port of the public IP and send payload by overflow of SMB I.
· Based on the analysis of malware principles, leveraged the spatial and timing features to detect malicious traffic with pattern matching and deep learning — e.g. We managed to detect almost 100% nmap scan. (In submission of Cybersecurity 2020)

An Interactive Online NS-3 Platform for Learning Network Protocols Jan 2020 - Mar 2020
Advisor: Associate Professor Xiaojun Hei   *Dian Group, HUST, Wuhan*

· Proposed and implemented an online NS-3 server with Vue, Nodejs and NS-3 engine, as the installation and configuration of NS-3 are complicated.
· Provided tutorial pages and relevant experiment guidelines on the Web UI.
· Adopted polling queue to improve the efficiency of NS-3 compiling, efficiency improved around 4x (In submission of SIMUtools 2020)

Smart City: Recovery of Damaged Structure based on Deep Learning Aug 2019 - Sep 2019
Advisor: Professor Shaofan Li   *UC Berkeley, CA*

· Adopted Finite Element Analysis method to simulate the physical principles of Cantilever.
· Collected the deformation data at various force position, direction and magnitude.
· Built deep neural network and trained the model to rebuild the initial status of the structure.

PROJECT EXPERIENCE

Matlab Music Generator and Composer   Feb 2019 - May 2019
Advisor: Professor Hao Wen   *Course Final Project*

· Analyzed the harmonics and envelopes of several instruments for timbre simulation.
· Defined protocols to parse sheet music and generate songs according to the sheet music input.
· Utilized open-source datasets to train our music composer AI. (ongoing)
· Designed UI for generator and composer.

NGINX Reverse Proxy for Secure File Sharing Service   Jun 2018 - Dec 2018
Advisor: Associate Professor Guihui Zhong   *Enterprise-level Project*

· Developed Windows Network Driver to redirect file-retrieving traffic to Nginx Server.
· Designed special flags and payloads for secure authentication. Parsed Samba protocol and dump the sharing files for access control.

· Improved Nginx server performace by adopting epoll mechanism and set up LVS for load balancing.

PUBLICATIONS

Zhiyu Zhang, Guohang Lu, Chengwei Zhang, Yayu Gao, Yajun Wu, Guohui Zhong, "CyFRS: A Fast Recoverable System for Cyber Range based on Real Network", IEEE Information Communication Technologies Conference 2020. (Online Oral Report)

Dewei Zeng[1] , **Zhiyu Zhang**[1] , Jiye Chen, Xiaojun Hei, "An Interactive Online Programming Platform for Learning Computer Network Protocols", SIMUtools 2020. (Submitted)

Si Liao, Chenming Zhou, Yonghui Zhao, **Zhiyu Zhang**, Chengwei Zhang, Yayu Gao, Guohui Zhong, "A Comprehensive Detection Approach of Nmap: Priciples, Rules and Experiments", Cybersecurity 2020. (Submitted)

COMPETITION AWARDS

Honorable Prize of American College Students Mathematical Modeling Competition.	Feb 2018, 2020
First Prize of Mathematical Modeling Competition of HUST, Top 1.5% among 128.	Dec 2018
Third Prize of Chinese College Students Mathematics Modeling Competition.	May 2018

MISCELLANEOUS

Computer Languages	C/C++, Python, Matlab, Go, LaTeX, Verilog, Assembly
Professional Skills	DevOps, Machine Learning, Binary Reverse, PWN, Backend
Software & Others	Linux, Multisim, Abaqus, PR
English	TOEFL 93 (Listening 23, Reading 27, Speaking 23, Writing 20)