JIAQI YAN

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EDUCATION

Illinois Institute of Technology *August 2014 - December 2019*
Ph.D in Computer Science
Advisor: Dr. Dong (Kevin) Jin
Thesis: A Scalable Simulation and Modeling Framework for Evaluation of Software-define Network Design and Security Applications
Interests: Deep/Machine Learning for Cyber Security, Software-defined Networking, Container-based Network Virtualization and Emulation
Overall GPA: 4.0/4.0

EXPERIENCE

Google Inc Nov 2021 - Current
Softeare Engineer Fulltime *Seattle, WA*

- Virtual Machine Memory Management in Google Cloud Platform team

Microsoft Corporation Jan 2020 - Nov 2021
Software Engineer Fulltime *Redmond, WA*

- Windows Network Adapter Window Driver Framework Class Extension (NetAdapterCx)
- Cached contiguous memory pool and IOMMU-based hybrid DMA for high performance network interface card (NIC) in Azure cloud networking
- Platform-level device reset support for Windows 11: recovery of an unresponsive NIC with both operating system and individual hardware vendor specific diagnostics
- Operating system built-in support for generic segmentation offload and receive segment coalescing in Windows 11
- Tools heavily used: C++, Kernel, Debugger, State Machine, Markdown

Facebook Inc. May 2019 - Aug 2019
Software Engineer Intern *Menlo Park, CA*

- Benchmarking Libra Blockchain System
- Built bench environment where Libra is running constantly for measuring system performance and monitoring operation healthiness
- Designed load generator and searched the maximum transaction throughput
- Found bottlenecks in production environment then successfully launch DDoS attack by injecting transactions with linearly increasing speed and volume
- Tools heavily used: Rust, Terraform, gRPC, Docker, AWS, Cargo, Git

Facebook Inc. June 2018 - Aug 2018
Software Engineer Intern *Menlo Park, CA*

- Completed tuple-space-search based generic packet classifier (GPC) BPF module redirecting nearly all Facebook datacenter's network applications
- Enhanced GPC with flow caching that improved a degree of magnitude search speed for large-scale input flows

- Built forwarding rule manager for efficient lookup/delete/update operations, and cache-evict algorithm to make dynamic control plane consistent
- High coverage unit tests and E2E tests on proof-of-concept system
- Tools heavily used: Linux eBPF, C/C++/Python, Thrift, Google Test, Mercurial

Google Inc. Feb 2018 - May 2018
Software Engineer Intern *Waterloo, Canada*

- Explored the open question why automated testing fails on ads totaling millions of impressions per day.
- Designed and implemented a **procedure** for uncovering reasons for testing quality errors for future design of countermeasures, by grouping ads along multiple dimensions.
- Organized and visualized analysis results in three highly interactive dashboards.
- Analyzed **redundant testing** to quantify potential resource savings by optimizing retry policies.
- Designed and implemented a **procedure** for identifying important 3rd parties with high proportions of test quality failures during automated testing.
- Tools heavily used: SQL dialect and query engine, data analysis and visualization platform, transactionless database systems, and protocol buffers.

RESEARCH

Deep Learning for Intrusion Detection System 2016 - 2019
PhD Research Project *Illinois Institute of Technology*

- Train deep Multilayer Perceptron network with efficient techniques, such as SGD and dropout.
- **Embed attributed control flow graph** of disassembled binary in supervised malware detection.
- Learn useful, hierarchical features unsupervisedly with generative models such as **stacked Restricted Boltzmann Machines** or **stacked Sparse/Denoise Autoencoders**, visualizing using **t-SNE**.
- Synthesize new attacking network traffics using various **Generative Adversarial Networks**.
- Measure precision/recall of NetLearner, my **TensorFlow**-based intrusion detection models, comparing to traditional ML approaches, e.g., SVM, decision trees.

Virtual Time System for Linux Container 2014 - 2016
PhD Research Project *Illinois Institute of Technology*

- Design and implement **Virtual Time System** in **Linux kernel**; features includes time dilation and time freeze for Linux container.
- Sent patch to Linux timekeeping's maintainer **John Stultz** as RFC.
- Adding virtualized clock to **Mininet**, the most popular **open source** SDN emulator, so that it can emulate 10 GB/s level link or x10 network devices.
- Integrate VTS with **DSSnet**, our hybrid modeling platform combining electric power distribution simulation with software-defined networking emulation.

PUBLICATIONS

Classifying Malware Represented as Control Flow Graphs using Deep Graph Convolutional Neural Network *DSN 2019*
Jiaqi Yan, Guanghua Yan, Dong Jin
IEEE/IFIP International Conference on Dependable Systems and Networks, Portland, Oregon

Distributed Virtual Time System on Embedded Linux for Evaluating Cyber-Physical Systems *PADS 2019*
Christopher Hannon, Jiaqi Yan, Dong Jin Best Paper
2019 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation, Chicago, IL

Virtual-Time-Accelerated Emulation for Blockchain Network and Application Evaluation *PADS 2019*
Xiaoliang Wu, Jiaqi Yan, Dong Jin
2019 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation, Chicago, IL

Simulation of a Software-defined Network as One Big Switch *PADS 2017*
Jiaqi Yan, Xin Liu, Dong Jin
2017 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation, NTU, Singapore

DSSnet: A Smart Grid Modeling Platform Combining Electrical Power Distribution System Simulation and Software Defined Networking Emulation *PADS 2016*
Christopher Hannon, Jiaqi Yan,Dong Jin Best Paper Nominee
2016 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation, Banff, Alberta, Canada

VT-Mininet: Virtual-time-enabled Mininet for Scalable and Accurate Software-Defined Network Emulation *SOSR 2015*
Jiaqi Yan, Dong Jin Acceptance Rate 19.7%
2015 ACM SIGCOMM Symposium on SDN Research, San Jose, CA, USA

A Virtual Time System for Linux-container-based Emulation of Software Defined Networks *PADS 2015*
Jiaqi Yan, Dong Jin Best Paper Nominee
2015 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation, London, UK

HONORS

Session Chair at 2017 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation *2017*
Chair of the "Simulation Applications" Session

Teaching Assistant: CS458 Cyber-Security *CS Department, IIT*

Best Poster Award *Workshop on Science of Security through Software-Defined Networking*
Towards A Secure and Resilient Industrial Control System with Software-Defined Networking
Dong Jin, Jiaqi Yan, Xin Liu, Christopher Hannon

First Place in Student Poster Session *2016 IIT Research Day*
DSSnet: A Smart Grid Modeling Platform Combining Electrical Power Distribution System Simulation and Software Defined Networking Emulation
Christopher Hannon, Jiaqi Yan, Dong Jin

Graduate Student Scholarship *2014 Beijing Normal University*
Awarded to the **top 5** student in their final year of graduate degree

Postgraduate Student Scholarship *2008 Beijing Normal University*
Awarded to the **top 10** student in their first year of Bachelors degree

TECHNICAL STRENGTHS

Computer Languages	C/C++, Python, Rust, Shell Script, LaTeX, Object-C, Swift
Platforms	Linux/Windows Kernel Development, TensorFlow, Keras, ONOS, iOS
Protocols	OpenFlow, TCP/IP, REST, JSON
Databases	MySQL, Microsoft SQL
Tools	Vim, Git, Xcode, Matlab