|  |  |
| --- | --- |
| Kaiyu Hou | (+1) 847-641-0586  [kyhou@u.northwestern.edu](mailto:kyhou@u.northwestern.edu)  [www.kyhou.com](http://www.kyhou.com)  1111 Church St. Apt. 605  Evanston, IL, 60201 |

## Objective

|  |
| --- |
| * **Research Intern**: Networked Systems and Protocols; Microservice. |

## Education

|  |  |
| --- | --- |
| * **Ph.D.** **Student** in **Computer Science** **Northwestern University** | 2017 – (2022) |

Prof. Yan Chen Area: Networked System, Cellular Network Security

|  |  |
| --- | --- |
| * **Master’s** in **Computer Science** **Xi’an Jiaotong University** | 2014 – 2017 |

**Rank**: 1st/89 **GPA**: 3.81/4.0 **Average**: 91.7

Prof. Chengchen Hu Area: Software Defined Networking (SDN)

|  |  |
| --- | --- |
| * **B.E.** in **Software Engineering Xi’an Jiaotong University** | 2010 – 2014 |

**Rank**: 1st/78 **GPA**: 3.94/4.0 **Average**: 92.4 (in Junior and Senior year)

## Research Experience

* Design and Implementation of a **QUIC** based network system for **Microservice** based Cloud2020 – Present
* Aim to integrate QUIC protocol into Kubernetes to replace the slow https function calls
* Measure and analyze the network performance after applied QUIC
* The Vulnerabilities of Emergency Call System in Cellular Network Protocols2018 - 2019
* Used **TLA+** to formally specify the **emergency call system** in **4G/5G** cellular network protocols
* Discovered serious **availability** and **security issues** in real-world carriers
* Built a **complete cellular network testbed** and verified those issues
* Aim to design **inductive generalization algorithms** to generate fixing solutions
* Automatically Specifying and Verifying Network Protocols2018 - Present
* Specifying natural language documented protocols to formal models for security checking is hard
* Working on automated translating implementation to CFA for verifying the correctness of protocols
* Generic Security Policy Enforcement System for **SDN-based Cloud**2017 – 2018
* Designed a **policy language** for resource protection and management of SDN-based Cloud
* Implemented in **OpenDaylight** controller, and deployed on **OpenStack**
* Routing Policy for Solving Reactive Model Overhead of **Software Defined Networks**2016 – 2017
* Proposed a **routing policy** to reduce the control channel bandwidth consumption up to 80%
* Implemented in **Floodlight** controller under **OpenFlow** and evaluated in **Open vSwitch** on real trace

## Publications

* *Help! No Emergency Calls? Discovering Emergency Call Pitfalls for Cellular Networks*

Kaiyu Hou, You Li, Yinbo Yu, Yan Chen, Hai Zhou

Under Submission

* *CellScope: Automatically Specifying and Verifying Cellular Network Protocols*

Yinbo Yu, You Li, Kaiyu Hou, Yan Chen, Hai Zhou, Jianfeng Yang

ACM Special Interest Group on Data Communication (SIGCOMM, Poster), 2019

* *A Lightweight Policy Enforcement System for Resource Protection and Management in the SDN-based Cloud*

Xue Leng, Kaiyu Hou, Yan Chen, Kai Bu, Libin Song, You Li

Computer Networks,Elsevier, 2019

* *COIN: A fast packet inspection method over compressed traffic*

Xiuwen Sun, Hao Li, Dan Zhao, Xingxing Lu, Kaiyu Hou, Chengchen Hu

Journal of Network and Computer Applications, Elsevier, 2019

* *SDNKeeper: Lightweight Recource Protection and Management System for SDN-based Cloud*

Xue Leng, Kaiyu Hou, Yan Chen, Kai Bu, Libin Song

IEEE/ACM 26th International Symposium on Quality of Service (IWQoS), 2018

* *SoftRing: Taming the reactive model for software defined networks*

Chengchen Hu, Kaiyu Hou, Hao Li, Ruilong Wang, Peng Zheng, Peng Zhang, Huanzhao Wang

IEEE 25th International Conference on Network Protocols (ICNP), 2017

* *Towards A Fast Packet Inspection over Compressed HTTP Traffic*

Xiuwen Sun, Kaiyu Hou, Hao Li, Chengchen Hu

IEEE/ACM 25th International Symposium on Quality of Service (IWQoS), 2017

## Experiences

* **Reviewer/Sub-reviewer** of CCS (’18, ’19), ICDCS (’18), ToN (’18)
* **Teaching Assistant** of
* CS 214: Data Structures; EECS 343 Operating Systems2019
* EECS 340: Introduction to Networking; IT 458: Information Security and Assurance2018
* **Activities**
* **Student President** of Dept., Computer Science and Technology, Xi’an Jiaotong University 2014 – 2017
* **Chair**, the ACM-ICPC Club of Xi’an Jiaotong University2013 – 2014

## Awards

|  |  |  |
| --- | --- | --- |
| * **Bronze Medal** ACM-ICPC Asia Regional Contest | 2012, 2013, 2014 | |
| * **Silver Medal** ACM-ICPC China Province Contest, Chengdu | 2013 | |
| * **Meritorious Winner** Mathematical Contest In Model | | 2013 |

## Honor

|  |  |  |
| --- | --- | --- |
| * **Graduate with Honor**  Xi’an Jiaotong University | 2014, 2017 | |
| * **Excellent Student Award** Xi’an Jiaotong University | 2011, 2012, 2013, 2015, 2016 | |
| * **Google Excellence Scholarship** Awarded to 3 students from each of top 20 Chinese universities | | 2013 |

## Skills

* TCP/IP Protocols, Cellular Network Protocols, Software Defined Networking; Formal Verification; Python