Kaiyu Hou

(+1) 847-641-0586
kyhou@u.northwestern.edu
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 – Present
  GPA: 3.96/4.0
  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

- The Vulnerabilities of Emergency Call System in Cellular Network Protocols   2018 - Present
  - Using **TLA+** to formally specify the emergency call system in **4G/5G** cellular network system
  - Discovering serious **security issues** in deployed emergency call system in real-world carriers
  - Building a **complete cellular network testbed**
  - Designing **inductive generalization algorithms** to generate fixing solutions

- Automatically Specifying and Verifying Network Protocols   2018 - 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
  - Applying CEGAR to efficiently inspects cellular network protocols in large scale

- 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

- *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
  - ACM Conference on Computer and Communications Security (CCS) — 2018, 2019
  - IEEE International Conference on Distributed Computing Systems (ICDCS) — 2018
  - IEEE/ACM Transactions on Networking (ToN) — 2018

- **Teaching Assistant** of
  - CS 214: Data Structures; EECS 343 Operating Systems — 2019
  - EECS 340: Introduction to Networking; IT 458: Information Security and Assurance — 2018

- **Activities**
  - **Student President** of Dept., Computer Science and Technology, Xi'an Jiaotong University — 2014 – 2017
  - **Chair**, the ACM-ICPC Club of Xi'an Jiaotong University — 2013 – 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; Formal Verification, Software Defined Networking, Python