Rui Bian

Data Scientist · Computer Engineering Ph.D.

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Education

University of Delaware *Newark, DE*

Ph.D. in Computer Engineering *Sep 2015 - Dec 2022*

- Advisor: Dr. Chase Cotton and Dr. Haining Wang

University of Science and Technology of China *Hefei, Anhui, China*

M.S. in Techniques and Applications of Synchrotron Radiation *Aug 2012 — Jun 2015*

- Advisor: Dr. Yangchao Tian and Dr. Gang Liu

University of Science and Technology of China *Hefei, Anhui, China*

B.S. in Mechanical engineering and Automation *Sep 2008 — Jun 2012*

- Undergrad research advisor: Dr. Yangchao Tian

Professional Experience

2023 - Now	**Technical Program Committee member**, IEEESM'23
2023 - Now	**Technical Program Committee member**, ICDATE 2023
2023 - Now	**Technical Program Committee member**, BalkanCom'23
2022 - Now	**Data Scientist**, Expatiate Communications
2015-2022	**Research Assistant**, University of Delaware
2016-2022	**Teaching Assistant**, University of Delaware
2021-2021	**Software Engineer Intern**, EPS Online INC
2012-2015	**Graduate Research Assistant**, University of Science and Technology of China
2011-2012	**Undergraduate Research Assistant**, University of Science and Technology of China
2011-2011	**Research Intern**, Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences

Teaching Experience

Fall 2022	**System Hardening and Protection**, Teaching Assistant	*Newark, DE*
Spring 2022	**Introduction to Cybersecurity**, Teaching Assistant	*Newark, DE*
Fall 2021	**System Hardening and Protection**, Teaching Assistant	*Newark, DE*
Spring 2021	**Introduction to Cybersecurity**, Teaching Assistant	*Newark, DE*
Fall 2020	**Advanced Cybersecurity**, Teaching Assistant	*Newark, DE*
Summer 2020	**USCC summer camp in Delaware**, Teaching Assistant	*Newark, DE*
Spring 2020	**Introduction to Cybersecurity**, Teaching Assistant	*Newark, DE*
Fall 2019	**Advanced Cybersecurity**, Teaching Assistant	*Newark, DE*
Spring 2019	**Web Application Security**, Teaching Assistant	*Newark, DE*
Fall 2018	**Advanced Cybersecurity**, Teaching Assistant	*Newark, DE*
Spring 2018	**System Hardening and Protection**, Teaching Assistant	*Newark, DE*
Fall 2017	**Introduction to Cybersecurity** , Teaching Assistant	*Newark, DE*
Spring 2017	**ECE Design Challenges**, Teaching Assistant	*Newark, DE*
Fall 2016	**Introduction to Network Security**, Teaching Assistant	*Newark, DE*

Research Experience

Project: Detect and analyze vulnerable transparent proxies *Newark, DE*

University of Delaware, Collaborate with ODU and Virginia Tech *Aug 2020 — Sep 2022*

- Utilized a globally distributed proxy platform to detect HTTP interceptions caused by transparent proxies
- Studied the characteristics of transparent proxies from various aspects – geographically and AS level distribution, server hosting, software and services
- Characterized and analyzed vulnerable transparent proxies that might suffer cache poison attacks
- Tools: Python, Bash, API, HTTP, ProxyRack

Project: Understanding Open Proxy Ecosystem *Newark, DE*

University of Delaware, Collaborate with ODU and Virginia Tech *Jan 2019 — Jul 2020*

- Conducted a large-scale study on over 436 thousand identified proxies, including 104 thousand responsive proxies in nine months.
- Identified that 7.17% of responsive proxies modify the page content, and 76.42% of those proxies perform malicious actions
- Analyzed two particular groups of open proxies—cloud-based proxies and long-term proxies
- Tools: Python, Bash, Web crawler, API, HTML, Ping, TraceRoute, Curl

Project: Passive analysis of anycast in global routing: Unintended impact of remote peering *Newark, DE*

University of Delaware, Collaborate with UCSD CAIDA *Jul 2017 — Dec 2018*

- Invented an alternative approach to characterize anycast based on previously collected global BGP routing information and achieved 90% accuracy in detecting anycast prefixes
- proved that anycast routing has been entangled with the increased adoption of remote peering and observed that at least 19.2% of anycast prefixes have been potentially impacted by remote peering
- Tools: Python, Bash, BGP, RIPE Atlas, RouteViews, BGPStream, machine learning, routing, TraceRoute, Ping

Project: Revisiting the Cloud Network Management on Amazon EC2 *Newark, DE*

University of Delaware *Sep 2015 — Dec 2015*

- Used EC2 as a case study to explore how the instances communicate within EC2 and how the instances communicate with the internet outside the EC2
- Confirmed that Amazon EC2 enhanced security managements including hiding routing information, isolating DNS servers and set VPC as default configurations of instances
- tools: Python, AWS, Bash, Nmap, Zmap, Ping, TraceRoute, Microsoft Office

Project: Ultralong focal length microlens array fabricated based on SU-8 photoresist *Hefei, Anhui, China*

University of Science and Technology of China *Sep 2012 — Jun 2015*

- Proposed a novel method to fabricate ultralong focal length microlens arrays based on SU-8 photoresist. The longest focal length was up to 4.4 mm from the microlens of 210 μm width
- Studied and validate the formation mechanism by simulation based on the finite element method
- Tools: Matlab, C, ANSYS, Surface Evolver, Finite element method, Photolithography, OriginLab

Project: Reconstruction of limited-angle and few-view nano-CT image via TV iterative reconstruction *Hefei, Anhui, China*

University of Science and Technology of China *Sep 2011 — Sep 2013*

- Acquire nano-CT images with high quality by using conventional Fourier reconstruction methods based on limited-angle or few-view projections and utilized the total variation (TV) iterative reconstruction to carry out numerical images and nano-CT image reconstruction with limited-angle and few-view data
- Tools: Matlab, C, OriginLab, image processing, Microsoft Office

Project: Research of CT reconstruction FBP algorithm based on Compressive Sensing *Hefei, Anhui, China*

University of Science and Technology of China *Sep 2011 — Sep 2012*

- Utilize Compressing sensing technology to enhance CT reconstruction Filtered Back-Projection (FBP) algorithm
- Tools: Matlab, C, OriginLab, Photo processing, Compressing sensing, Microsoft Office

Research Intern *Changchun, Jilin, China*

Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences *Jul 2011 — Sep 2011*

- Utilize C, Matlab and ANSYS to analyze Thirty Meters Telescope (TMT)'s support structure with finite element method (FEM)
- tools: C, Matlab, ANSYS, OriginLab, Microsoft Office

Publications

Published

Rui Bian, Shuai Hao, Haining Wang, and Chase Cotton. "Shining a light on dark places: A comprehensive analysis of open proxy ecosystem." Computer Networks 208 (2022): 108893.

Bian, Rui, Shuai Hao, Haining Wang, Amogh Dhamdere, Alberto Dainotti, and Chase Cotton. "Towards passive analysis of anycast in global routing: Unintended impact of remote peering." ACM SIGCOMM Computer Communication Review 49, no. 3 (2019): 18-25.

Bian, Rui, Ying Xiong, Xiangyu Chen, Penghui Xiong, Shuangyue Hou, Shan Chen, Xiaobo Zhang, Gang Liu, and Yangchao Tian. "Ultralong focal length microlens array fabricated based on SU-8 photoresist." Applied Optics 54, no. 16 (2015): 5088-5093.

Liang, Zhiting, Yong Guan, Gang Liu, **Rui Bian**, Xiaobo Zhang, Ying Xiong, and Yangchao Tian. "Reconstruction of limited-angle and few-view nano-CT image via total variation iterative reconstruction." In X-Ray Nanoimaging: Instruments and Methods, vol. 8851, pp. 156-162. SPIE, 2013.

Patent. G Liu, Y Xiong, **R Bian**, Z Xiaobo, T Yangchao. "Manufacturing method of micro lens" CN104,614,936 A. 2015.

In Review

Rui Bian, Lin Jin, Shuai Hao, Haining Wang, and Chase Cotton. "Silent Observers Make a Difference: A Large-scale Analysis of Transparent Proxies on the Internet"

Mentoring

2014-2015	**Yue Hu**, Undergraduate Student, University of Science and Technology of China	*Anhui, China*
2019-2021	**Dan Goodman**, Master Student, University of Delaware	*Newark, DE*

Awards, Fellowships, & Grants

2017 **SANS CyberStart scholarship, ranking of 44 out of 3,935 people**, USCC
2010 **Outstanding Student Scholarship**, University of Science and Technology of China
2009 **Best annual report in Student journalists association**, University of Science and Technology of China
2008 **Outstanding Freshman Scholarship**, University of Science and Technology of China

Professional Development

Development

Delaware Secure Workshop

Peer Review

CSAE (International Conference on Computer Science and Application Engineering)
TNSE (Transactions on Network Science and Engineering)
IEEE Access
IEEE Communications Letters
PAM (Passive and Active Measurement International Conference)
ICICS (International Conference on Information and Communications Security)
DSN (International Conference on Dependable Systems and Networks)
CODASPY (Conference on Data and Application Security and Privacy)
IEEE SM (IEEE International Conference on Smart Mobility)
MDPI AI, Computers, Networks
IEEE IWCMC 2023 Security Symposium
ICDATE 2023 (International Conference on Digital Applications, Transformation & Economy 2023)
2023 IEEE Transportation Electrification Conference & Expo
IEEE IWCMC 2023 Security Symposium
ICASIS2023 (International Conference on Advanced Sensing and Intelligent Systems)
BalkanCom'23

Professional Memberships

IEEE-Institute of Electrical and Electronics Engineers
ACM-Association for Computing Machinery