

# Rui Bian

DATA SCIENTIST · COMPUTER ENGINEERING PH.D.

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## Education

### University of Delaware

PH.D. IN COMPUTER ENGINEERING

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

Newark, DE

Sep 2015 - Dec 2022

### University of Science and Technology of China

M.S. IN TECHNIQUES AND APPLICATIONS OF SYNCHROTRON RADIATION

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

Hefei, Anhui, China

Aug 2012 — Jun 2015

### University of Science and Technology of China

B.S. IN MECHANICAL ENGINEERING AND AUTOMATION

• Undergrad research advisor: Dr. Yangchao Tian

Hefei, Anhui, China

Sep 2008 — Jun 2012

## Professional Experience

2023 - Now **Technical Program Committee member**, IEEE SM'23  
2023 - Now **Technical Program Committee member**, ICDATE 2023  
2023 - Now **Technical Program Committee member**, BalkanCom'23  
2023 - Now **Technical Program Committee member**, IEEE ICECIE'20233  
2022 - Now **Data Scientist**, Expatriate 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 22	<b>System Hardening and Protection</b> , Teaching Assistant	Newark, DE
Spring 22	<b>Introduction to Cybersecurity</b> , Teaching Assistant	Newark, DE
Fall 21	<b>System Hardening and Protection</b> , Teaching Assistant	Newark, DE
Spring 21	<b>Introduction to Cybersecurity</b> , Teaching Assistant	Newark, DE
Fall 20	<b>Advanced Cybersecurity</b> , Teaching Assistant	Newark, DE
Summer 20	<b>USCC summer camp in Delaware</b> , Teaching Assistant	Newark, DE
Spring 20	<b>Introduction to Cybersecurity</b> , Teaching Assistant	Newark, DE
Fall 19	<b>Advanced Cybersecurity</b> , Teaching Assistant	Newark, DE
Spring 19	<b>Web Application Security</b> , Teaching Assistant	Newark, DE
Fall 18	<b>Advanced Cybersecurity</b> , Teaching Assistant	Newark, DE
Spring 18	<b>System Hardening and Protection</b> , Teaching Assistant	Newark, DE
Fall 17	<b>Introduction to Cybersecurity</b> , Teaching Assistant	Newark, DE
Spring 17	<b>ECE Design Challenges</b> , Teaching Assistant	Newark, DE
Fall 16	<b>Introduction to Network Security</b> , Teaching Assistant	Newark, DE

## Research Experience

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### **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  $\mu\text{m}$  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

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### PUBLISHED

**Rui Bian.** "Using Stand-Off Observation and Measurement to Understand Aspects of the Global Internet", in proquest, Dissertation, University of Delaware, Electrical and Computer Engineering, Dec 2022.

**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.

**Rui Bian.** "The Research of Microlens Arrays based on SU 8 Photoresist", in University of Science and Technology of China, Master Thesis, University of Science and Technology of China, Jul 2015.

**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

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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

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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

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### DEVELOPMENT

#### Delaware Secure Workshop

### PAPER REVIEWER

- 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
- IEEE ICECIE'2023
- STECONF(Science, Technology and Engineering Conferences) 2023
- ICCCM 2023
- IEEE-ECCE 2023
- Algotel/Cores 2023
- 2023 IEEE RTC
- WiCV 2023 (Women in Computer Vision Workshop) at CVPR

#### **PROFESSIONAL MEMBERSHIPS**

IEEE-Institute of Electrical and Electronics Engineers

ACM-Association for Computing Machinery