

Rui Bian

DATA SCIENTIST · COMPUTER ENGINEERING PH.D.

Los Angeles, CA, 91367

✉ bianrui@udel.edu | 🏠 bianrui0315.github.io | 📧 bianrui0315 | 🌐 bianrui0315 | 🐦 @Ru1B1an

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

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	System Hardening and Protection , Teaching Assistant	Newark, DE
Spring 22	Introduction to Cybersecurity , Teaching Assistant	Newark, DE
Fall 21	System Hardening and Protection , Teaching Assistant	Newark, DE
Spring 21	Introduction to Cybersecurity , Teaching Assistant	Newark, DE
Fall 20	Advanced Cybersecurity , Teaching Assistant	Newark, DE
Summer 20	USCC summer camp in Delaware , Teaching Assistant	Newark, DE
Spring 20	Introduction to Cybersecurity , Teaching Assistant	Newark, DE
Fall 19	Advanced Cybersecurity , Teaching Assistant	Newark, DE
Spring 19	Web Application Security , Teaching Assistant	Newark, DE
Fall 18	Advanced Cybersecurity , Teaching Assistant	Newark, DE
Spring 18	System Hardening and Protection , Teaching Assistant	Newark, DE
Fall 17	Introduction to Cybersecurity , Teaching Assistant	Newark, DE
Spring 17	ECE Design Challenges , Teaching Assistant	Newark, DE
Fall 16	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. "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 Dhamdhere, 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

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

PAPER REVIEWER

Conference Reviewer

- IEEE INFOCOM '17 '18 '19 '20 '21
- IEEE CNS '18 '20
- IEEE HASE '19' MIND '20
- ACNS '20

- SRDS '21
- CSAE '22
- PAM '22
- ICICS '20
- DSN '19 '21 '22
- CODASPY '20'21
- IEEE SM '20'23
- IEEE IWCMC Security Symposium '23
- ICDATE '23
- IEEE ITEC '23
- ICASIS '23
- BalkanCom'23
- IEEE ICECIE '23
- STECONF '23
- ICCCM '23
- IEEE-ECCE '23
- Algotel/Cores '23
- IEEE RTC '23
- WiCV 2023 at CVPR '23
- IEEE LCN-MarCaS '23
- IEEE NetSoft S4SI '23

Journal Reviewer

- TNSE (Transactions on Network Science and Engineering)
- IEEE Access
- IEEE Communications Letters
- Mobile Information Systems

PROFESSIONAL MEMBERSHIPS

IEEE-Institute of Electrical and Electronics Engineers

ACM-Association for Computing Machinery