

Umar Iqbal

Research Interests

Privacy; Security; Usability; Online Tracking; Online Advertising.

Employment

- Starting **University of Washington, Postdoctoral Scholar**
October 2021 Advisor: Prof. Franziska Roesner
- 2020–21 **University of California-Davis, Visiting Student**
Advisor: Prof. Zubair Shafiq
- 2016–21 **University of Iowa, Research Assistant**
Advisor: Prof. Zubair Shafiq
- 2020 **Apple, WebKit Privacy Research Intern**
Selected among the cohort of interns to present to Craig Federighi (SVP)
- 2019 **Mozilla, Privacy Research Intern**
- 2018 **Brave, Research Intern**
- 2017 **Microsoft, Program Manager Intern**
- 2016 **Systems and Security Group, LUMS University, Pakistan, Research Assistant**
- 2013–16 **LMKT, Pakistan, Solution Analyst**

Education

- 2016–21 **Ph.D. in Computer Science**
University of Iowa, *Dissertation title: Towards a Privacy-Preserving Web*
Graduate Research Excellence Award
Ada Louise Ballard and Seashore Dissertation Fellowship
Graduate College Post-Comprehensive Research Fellowship
- 2009–13 **B.S. in Computer Science**
National University of Computer & Emerging Sciences (NUCES), Pakistan.
Dean's list of honor (2012,2013)

Honors & Awards

- 2021 **Computing Innovation Fellowship, Computing Research Association (CRA)**
- 2021 **Graduate Research Excellence Award, University of Iowa**
- 2020 **Best Applied Research Paper (AdGraph), 3rd place, Cybersecurity Awareness Worldwide (CSAW)**
- 2020 **Ada Louise Ballard and Seashore Dissertation Fellowship, University of Iowa**
- 2019 **Graduate College Post-Comprehensive Research Fellowship, University of Iowa**
- 2016 **Winner PeaceTech Exchange, LUMS University, Pakistan**
- 2012–13 **Dean's List of Honor, NUCES University, Pakistan**
- 2016–21 **Travel Grants, IEEE S&P (2020, 21), NDSS (2020), AMC IMC (2017), IEEE CNS (2016), USENIX Security (2016)**

Publications

- USENIX 2022 **WebGraph: Capturing Advertising and Tracking Information Flows for Robust Blocking**
Sandra Siby, **Umar Iqbal**, Steven Englehardt, Zubair Shafiq, Carmela Troncoso
To appear at the USENIX Security Symposium 2022
- ACSAC 2021 **Eluding ML-based Adblockers With Actionable Adversarial Examples**
Shitong Zhu, Zhongjie Wang, Xun Chen, Shasha Li, Keyu Man, **Umar Iqbal**, Zhiyun Qian, Kevin S Chan, Srikanth V Krishnamurthy, Zubair Shafiq, Yu Hao, Guoren Li, Zheng Zhang, Xiaochen Zou
To appear at the Annual Computer Security Applications Conference 2021
- S&P 2021 **Fingerprinting the Fingerprinters: Learning to Detect Browser Fingerprinting Behaviors**
Umar Iqbal, Steven Englehardt, Zubair Shafiq
IEEE Symposium on Security and Privacy, San Francisco, 2021
Acceptance rate: 77/643=11.9%
- S&P 2020 **AdGraph: A Graph-Based Approach to Ad and Tracker Blocking**
Umar Iqbal, Peter Snyder, Shitong Zhu, Benjamin Livshits, Zhiyun Qian, Zubair Shafiq
IEEE Symposium on Security and Privacy, San Francisco, 2020
Acceptance rate: 104/841=12.3%
Best applied research paper, 3rd place, CSAW, NYU Tandon
- WWW 2019 **ShadowBlock: A Lightweight and Stealthy Adblocking Browser**
Shitong Zhu, **Umar Iqbal**, Zhongjie Wang, Zhiyun Qian, Zubair Shafiq, Weiteng Cheng
The Web Conference, San Francisco, 2019
Acceptance rate: 225/1247=18%
- IMC 2017 **The Ad Wars: Retrospective Measurement and Analysis of Anti-Adblock Filter Lists**
Umar Iqbal, Zubair Shafiq, Zhiyun Qian
ACM Internet Measurement Conference, London, 2017
Acceptance rate: 42/179=23.5%
- DSN 2016 **Malware Slums: Measurement and Analysis of Malware on Traffic Exchanges**
Salman Yousaf, **Umar Iqbal**, Shehroze Farooqi, Raza Ahmad, Zubair Shafiq, Fared Zaffar
IEEE/IFIP International Conference on Dependable Systems and Networks, France, 2016
Acceptance rate: 58/259 =22.4%

Open Source & Industry Impact

- Brave Browser **AdGraph/PageGraph in Brave Browser**
I proposed and implemented a machine learning based ad and tracker blocking system that is being integrated in the Brave Browser. [\[Official Announcement\]](#) [\[Brave's Integration\]](#) [\[Source Code\]](#)
- Safari WebKit **WebKit's Intelligent Tracking Protection (ITP)**
I have contributed to the Intelligent Tracking Protection in Safari WebKit. My code patches to WebKit allow for logging of JavaScript API execution. [\[Code Patch\]](#) [\[Code Patch\]](#)
- Mozilla Firefox **JavaScript API Fingerprint-ability Reduction**
FP-Inspector's detected fingerprinting APIs are being re-evaluated for their fingerprint-ability by Firefox. [\[Bug reports to Mozilla Firefox\]](#)
- Microsoft Edge **Adblock Landscape**
I wrote a technical report that evaluated the feasibility of ad and tracker blocking in Microsoft Edge. In light of my evaluation, Microsoft joined Coalition for Better Ads (CBA) to develop better ads standards for desktop and mobile web.
- Ad/Tracker Blocking Filter Lists **Contribution to Filter Lists**
Popular filter lists such as DuckDuckGo (used by Safari), Disconnect (used by Firefox and Edge), and Easylist/EasyPrivacy (used by uBlock Origin and dozens of other anti-tracking tools) have incorporated trackers detected by FP-Inspector. [\[Bug reports to filter lists\]](#)

██████████ Fellowships (Total award: ~ \$275,000)

- CI Fellowship **Computing Innovation Fellowship**, *Computing Research Association (CRA)*
2021-23, Total amount: \$254,934
- Dissertation Fellowship **Ada Louise Ballard and Seashore Dissertation Fellowship**, *University of Iowa*
2020, Total amount: \$10,000
- Post-comp Fellowship **Graduate College Post-Comprehensive Research Fellowship**, *University of Iowa*
2019, Total amount: \$10,000

██████████ Teaching

- CS 1210 **Fundamentals of Computing**
Summer 2021, University of Iowa
- CS 4980 **Online Advertising & Tracking**
Fall 2019, University of Iowa

██████████ Mentoring

Undergraduate

- 2019- **Charlie Wolfe**, The University of Iowa
- 2020- **Charles Nguyen**, University of California-Davis

Masters

- 2020-21 **Pooneh Bahrami**, University of California-Davis, *Post-grad: Ph.D. at UC Davis*

Ph.D.

- 2019- **Sandra Siby**, EPFL Switzerland
- 2020- **Zengrui Liu**, Texas A&M University
- 2020- **Shoor Munir**, University of California-Davis
- 2020- **Yash Vekaria**, University of California-Davis

██████████ Services

- PETS 2022 **Program Committee Member**
Privacy Enhancing Technologies Symposium (PETS)
- CCS 2021 **Program Committee Member**
ACM Conference on Computer and Communications Security
- 2017-21 **Invited Reviewer**
The Web Conference (WWW)
Privacy Enhancing Technologies Symposium (PETS)
International Symposium on Research in Attacks, Intrusions and Defenses (RAID)
IEEE Transactions on Dependable and Secure Computing (TDSC)
- Ulowa **Student Travel Grant Review Committee Member**
2018-19 Graduate & Professional Student Government, The University of Iowa
- IMC 2017 **Shadow Program Committee Member**
ACM Internet Measurement Conference

██████████ Invited Talks

- 2020 **Fingerprinting the Fingerprinters**
Brave Software
- 2019 **Machine Learning for Ad and Tracker Blocking**
Ulowa Graduate Research Symposium
- 2019 **AdGraph: A Graph-Based Approach to Ad and Tracker Blocking**
Adblock Developer Summit

2019 **Machine Learning For Detecting Fingerprinting Scripts**

Mozilla Corporation

2019 **An Overview of Ad and Tracker Blocking**

Mozilla Security Research Summit

Selected Media Coverage

CNET 2018 **Brave's AI blocks ads better than today's browser plug-ins, company says**, *Stephen Shankland*, [\[Link\]](#)

ZDNet 2020 **A quarter of the Alexa Top 10K websites are using browser fingerprinting scripts**, *Catalin Cimpanu*, [\[Link\]](#)

VentureBeat
2020 **Researchers use AI to combat and quantify browser fingerprinting**, *Kyle Wiggers*, [\[Link\]](#)

Forbes 2020 **No More Third Party Cookies, No Problem**, *Augustine Fou*, [\[Link\]](#)