

SheharBano

(February 28, 2018)

Postdoctoral Research Associate, University College London

Dept. of Computer Science, Malet Place Engineering Building. Gower Street, London WC1E 6BT, UK.

☐ sheharbano_86 (Skype) | ✉ s.bano@ucl.ac.uk | 🏠 sheharbano.com | 📱 sheharbano | 🌐 shehar-bano

Research Interests

- Network & System Security; Internet Measurement; Blockchains; Information Control [Censorship, Discrimination & Misinformation]; Malware & Intrusion Detection.

Education

University of Cambridge

Cambridge, UK

PHD IN COMPUTER SCIENCE

2013–2017

Thesis: “Characterization of Internet Censorship from Multiple Perspectives”. Supervisors: Jon Crowcroft. Co-Supervisors: Steven Murdoch (University College London), Vern Paxson (UC Berkeley), Ross Anderson

National University of Science and Technology (NUST)

Islamabad, Pakistan

MASTERS IN COMPUTER AND COMMUNICATION SECURITY. CGPA: 3.95/4.0.

2010–2013

Thesis: “A Study of Botnets: Systemization of Knowledge and Correlation-based Detection”. Supervisors: S. Ali Khayam, Fauzan Mirza.

International Islamic University

Islamabad, Pakistan

BACHELORS IN COMPUTER SCIENCE. CGPA: 3.98/4.0

2005–2010

Honors & Awards

- **Mary Bradburn Scholarship**, The British Federation of Women Graduates (Aug'16); **Best Paper Nomination**, ACM Internet Measurement Conference (Nov'14); **Honorary Cambridge Trust Scholar**, University of Cambridge (Aug'13); **Recipient of President's Gold Medal**, NUST, Pakistan (Feb'13); **Merit Scholarship**, International Islamic University, Pakistan (2006-08), **National Talent Scholarship**, Board of Intermediate and Secondary Education Peshawar, Pakistan (Aug'04).

Experience

University College London

London, UK

RESEARCH ASSOCIATE

Mar. 2017–PRESENT

- Design, scalability and applications of blockchains funded by EU DECODE and EPSRC Glass Houses.

Computer Lab, Univ. of Cambridge

Cambridge, UK

RESEARCH ASSISTANT

Oct. 2013–Feb. 2017

- Characterisation of Internet censorship funded by EPSRC-Royal Society “Understanding, Measuring and Improving Online Privacy”.

Networking Group, International Computer Science Institute (ICSI)

Berkeley, U.S.A

SUMMER INTERN

Jul. 2013–Sep. 2013

- Developed methodologies to establish censorship ground truth based on offline analysis of captured network data.

Self-Employed

King's Lynn, UK

INDEPENDENT RESEARCHER

Nov. 2012–Jun. 2013

- Designed and implemented BotFlex—a domain-specific, flexible and extensible network-based tool for botnet detection. Evaluated it over 500 GB enterprise traffic collected from an ISP, with ground truth provided by Team Cymru.
- Demonstrated that illumination of the network analysis model of a censorship system can facilitate circumvention attempts by probing the Great Firewall of China and inferring its traffic analysis model.

Networking Group, International Computer Science Institute (ICSI)

Berkeley, U.S.A

SUMMER INTERN

Aug. 2012–Oct. 2012

- Conducted black box penetration testing of a network security monitor Bro's IPv6 implementation. Wrote cluster-friendly scripts for detection of DNS and ICMP attacks, and malicious scanning.

SysNet Lab, Foundation for Advancement of Science and Technology (FAST)

Islamabad, Pakistan

RESEARCH ASSISTANT

Feb. 2012–Jul. 2012

- Developed a taxonomy of botnet behaviour, detection mechanisms and defense strategies.
- Employed Bayesian network to make evidence-based predictive and diagnostic inferences for botnet infection.

- Investigated the effect of frequent power outages in Pakistan on botnet command and control communication (C&C).

Publications

[C = CONFERENCE] [J = JOURNAL] [W = WORKSHOP] [M = MAGAZINE] [P = POSTER] [T = TECHNICAL REPORT]

- [T] Alberto Sonnino, Mustafa Al-Bassam, **Shehar Bano** and George Danezis. “Coconut: Threshold Issuance Selective Disclosure Credentials with Applications to Distributed Ledgers”. arXiv preprint, Feb’18.
- [C] Shweta Bhatt, Sagar Joglekar, **Shehar Bano** and Nishanth Sastry. “Illuminating the Ecosystem of Partisan Websites”. To appear in the World Wide Web Conference (WWW), 2018.
- [T] **Shehar Bano**, Alberto Sonnino, Mustafa Al-Bassam, Sarah Azouvi, Patrick McCorry, Sarah Meiklejohn, and George Danezis. “SoK: Consensus in the Age of Blockchains”. arXiv preprint, Nov’17.
- [M] **Shehar Bano**, Mustafa Al-Bassam, George Danezis. “The Road to Scalable Blockchain Designs”. *USENIX ;login: Magazine*, Winter 2017, Vol. 42, No. 4 (;login: 2017).
- [C] Mustafa Al-Bassam, Alberto Sonnino, **Shehar Bano**, Dave Hryczynyn and George Danezis. “Chainspace: A Sharded Smart Contracts Platform”. Proceedings of the 25th Network and Distributed System Security Symposium (NDSS), 2018.
- [M] Hamed Haddadi, Rishab Nithyanand, **Sheharbano Khattak**, Mobin Javed, Narseo Vallina-Rodriguez, Marjan Falahrastegar, Julia E. Powles, Emiliano De Cristofaro, Steven J. Murdoch. “The Adblocking Tug-of-War”. *USENIX ;login: Magazine*, Winter 2016, Vol. 41, No. 4 (;login: 2016).
- [W] Rishab Nithyanand, **Sheharbano Khattak**, Mobin Javed, Narseo Vallina-Rodriguez, Marjan Falahrastegar, Julia E. Powles, Emiliano De Cristofaro, Hamed Haddadi and Steven J. Murdoch. “Ad-Blocking and Counter Blocking: A Slice of the Arms Race”. Proceedings of the 6th USENIX Workshop on Free and Open Communications on the Internet (FOCI), 2016.
- [C] **Sheharbano Khattak**, Tariq Elahi, Laurent Simon, Colleen Swanson, Steven J. Murdoch, Ian Goldberg. “SoK: Making Sense of Censorship Resistance Systems”. Proceedings on Privacy Enhancing Technologies (PETS), Vol. 2016, No. 4, 2016.
- [C] **Sheharbano Khattak**, David Fifield, Sadia Afroz, Mobin Javed, Srikanth Sundaresan, Vern Paxson, Steven J. Murdoch, and Damon McCoy. “Do You See What I See? Differential Treatment of Anonymous Users”. Proceedings of the 23rd Network and Distributed System Security Symposium (NDSS), 2016.
- [J] **Sheharbano Khattak**, Zaafer Ahmed, Affan A. Syed and Syed Ali Khayam. “BotFlex: A community-driven tool for botnet detection”, *Elsevier Journal of Network and Computer Applications*, Volume 58, Dec’15, Pages 144-154.
- [T] **Sheharbano Khattak**, Laurent Simon, and Steven J. Murdoch. “Systemization of Pluggable Transports for Censorship Resistance”. arXiv preprint, Dec’14.
- [C] **Sheharbano Khattak**, Mobin Javed, Syed Ali Khayam, Zartash Afzal Uzmi and Vern Paxson. “A Look at the Consequences of Internet Censorship Through an ISP Lens”. Proceedings of the 14th ACM SIGCOMM conference on Internet measurement (IMC), 2014.
- [P] **Sheharbano Khattak**, Zaafer Ahmed, Affan A. Syed and Syed Ali Khayam. “POSTER: BotFlex: A Community-driven Tool for Botnet Detection”, ACM International Conference on Computer and Communication Security (CCS), 2013.
- [J] **Sheharbano Khattak**, Naurin Rasheed Ramay, Kamran Riaz Khan, Affan A. Syed and Syed Ali Khayam. “A Taxonomy of Botnet Behavior, Detection and Defense”, *IEEE Journal of Communications Surveys & Tutorials*, Vol. PP, Issue 99, Oct’13, pp. 1 - 27.
- [W] **Sheharbano Khattak**, Mobin Javed, Philip D. Anderson and Vern Paxson. “Towards Illuminating a Censorship Monitor’s Model to Facilitate Evasion”, in proceedings of the 3rd USENIX Workshop on Free and Open Communications on the Internet (FOCI), 2013.
- [P] Naurin Rasheed Ramay, **Sheharbano Khattak**, Affan A. Syed and Syed Ali Khayam. “POSTER: Bottleneck: A Generalized, Flexible, and Extensible Framework for Botnet Defense”, IEEE Symposium on Security and Privacy (S&P), 2012.

Media Coverage

- The Morning Paper, BBC, The Register, Ars Technica, PCWorld, The Next Web, heise.de, Naked Security, CoinDesk, BuzzFeed, Cambridge TV.

Selected Talks

- Characterization of Internet Censorship from Multiple Perspectives.** Techtime Talk, The Guardian, Jun’17., London UK. Security Research Talk, Imperial College London, Jun’17, London UK. Darwin Science Seminar, Darwin College, University of Cambridge, May’17, Cambridge UK. Networks Research Group Seminar, Queen Mary University London, Apr’17, London, UK. Networked Systems Seminar, King’s College London, Mar’17, London, UK. InfoSec Seminar, University College London, Mar’17, London, UK. Centre for Research in the Arts, Social Sciences and Humanities (CRASSH) Seminar, University of Cambridge, Mar’17, Cambridge, UK.
- Do You See What I See? Differential Treatment of Anonymous Users.** Constructive Security Group Seminar, Microsoft Research Cambridge, Apr’16, Cambridge UK. The Network and Distributed System Security Symposium (NDSS), Feb’16, San Diego US. InfoSec Seminar, University College London, Feb’16, London UK. Security Seminar, University of Cambridge, Feb’16, Cambridge UK.
- A Look at the Consequences of Internet Censorship Through an ISP Lens.** IRTF Workshop on Global Access to the Internet for All (GAIA), Nov’15, London UK. 14th ACM SIGCOMM Conference on Internet Measurement (IMC), Nov’14, Vancouver Canada.
- Computerphile Talks.** “Scaling Blockchains”, “Internet Censorship Explained” and “Botnets”.

Teaching

- Session Convener. “Blockchain” track, Master’s course “Computer Security: Current Applications and Research”, University of Cambridge. Mar’18.
- Guest Lecturer. “Internet Censorship, Circumvention and Measurement”, Master’s course “Privacy Enhancing Technologies”, University College London. Feb’18.

- Reading Group Convener. “Internet Measurement” (2018–Present), “Blockchains” (2017–Present), University College London.
- Session Convener. “Censorship Resistance” track, Master’s course “Computer Security: Current Applications and Research”, University of Cambridge. Feb’15, Feb’16, Mar’17.
- Supervisor (small-group teaching). Undergraduate course “Operating Systems”, University of Cambridge. 2013.

Service / Professional Membership

- General co-chair. IEEE Workshop on Security & Privacy on the Blockchain (IEEE S&B) 2018.
- PC co-chair. IEEE Workshop on Security & Privacy on the Blockchain (IEEE S&B) 2018.
- PC member. ACM Conference on Computer and Communications Security (CCS) 2018, ACM Symposium on Electronic Crime Research (eCrime) 2018, IEEE Workshop on Blockchain Technologies and Applications (BTA) 2018, The Web Conference (WWW) 2018, Privacy Enhancing Technologies Symposium (PETS) 2017–19. USENIX Workshop on Free and Open Communications on the Internet (FOCI) 2017.
- External reviewer. The Network and Distributed System Security Symposium (NDSS) 2017, 2018. Financial Cryptography (FC) 2016, ACM Conference on Computer and Communications Security (CCS) 2016.
- Journal reviewer. IEEE Pervasive Computing 2018, ACM Transactions on the Web (TWEB) 2018.
- Member. IC3—The Initiative For Cryptocurrencies & Contracts (2017–Present), UCL CBT—The Centre for Blockchain Technologies (2017–Present).
- Volunteer mentor. GradApp Lab, a mentorship program for Pakistani students applying to graduate schools abroad. 2015–Present.
- Founder and steering committee member. London Infosec, a consortium for UK information security academics. 2018–Present.

References

- Available on request.