ANUPAM DAS

Assistant Professor ► Department of Computer Science ► North Carolina State University
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EDUCATION

University of Illinois at Urbana-Champaign (UIUC), Urbana, IL   2016

- **Ph.D.**, Computer Science
- Dissertation: *Understanding and Mitigating the Privacy Risks of Smartphone Sensor Fingerprinting*
- Advisor: Dr. Nikita Borisov

Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh   2010

- **M.S.**, Computer Science and Engineering
- Thesis: *Dynamic Trust Model for Multi-agent Systems*
- Advisor: Dr. M. Mahfuzul Islam

Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh   2008

- **B.S.**, Computer Science and Engineering
- Thesis: *Evolution of Neural Network using Genetic Algorithm*
- Thesis Supervisor: Dr. Md. Monirul Islam and Dr. Md. Shohrab Hossain

ACADEMIC AND RESEARCH APPOINTMENTS

Assistant Professor   2019 – present
Computer Science, North Carolina State University, Raleigh, NC

Postdoctoral Fellow   2016 – 2018
Computer Science, Carnegie Mellon University, Pittsburgh, PA

Research Assistant   2011 – 2016
Computer Science, University of Illinois at Urbana-Champaign, Urbana, IL

Lecturer   2008 – 2010
Computer Science and Engineering, Bangladesh University of Engr. and Tech., Dhaka, Bangladesh

TEACHING

Instructor, Department of Computer Science, NCSU

- CSC 495 – Special topic in Privacy: Spring 2019, Spring 2020
- CSC 591 – Special topic in Privacy: Fall 2019

Guest Lecturer, School of Computer Science, CMU

- CS 15-421/08-731 – Information Security and Privacy: Fall 2016

Instructor, Department of Computer Science and Engineering, BUET

- CSE 321 – Computer Networks: May 2010
- CSE 209 – Digital Electronics and Pulse Techniques: Oct. 2009
- CSE 409 – Computer Graphics: Mar. 2009
- CSE 205 – Digital Logic Design: Jul. 2008
- CSE 100 – Introduction to Computer Programming: Apr. 2008

Cisco Regional Academy Instructor, BUET

- CNNA Exploration Module 1 to 4: May 2008 – Aug. 2010

STUDENTS/MENTORING

Current PhD Students: Shaohu Zhang; Taufiq Islam Protick
Current PhD Committees: Albert Gorski [advised by Dr. Will Enck]
Current MS Students: Sheel Jayesh Shah
Current Undergraduate Students: Neetya Shah; Courtney Weglar; Evan Lafontaine
Past Masters Students: Suraj Siddharudh (Fall 2019); Prashanthi Kanniappan (Fall 2019); Deepayan Bardhan (Fall 2019)
Past Master Committees: Sanket Goutam (Spring 2019) [advised by Dr. Will Enck and Dr. Brad Reaves]

INDUSTRIAL EXPERIENCE

Research Intern   Spring 2015
   Google, Mountain View, CA
Research Intern   Summer 2014
   VMware, Palo Alto, CA
Research Associate   Summer 2013
   DisruptDev (startup), New York, NY
Research Intern   Summer 2012
   NEC Labs America, Princeton, NJ

AFFILIATIONS

- The Association for Computing Machinery (ACM)
- The Institute of Electrical and Electronics Engineers (IEEE)
- USENIX Advanced Computing Systems Association (USENIX)

HONORS AND AWARDS

- **Best Paper Award at the 8th ACM International Conference on Multimedia System (MMSys)**, *with Junjue Wang, Brandon Amos, Padmanabhan Pillai, Norman Sadeh, and Mahadev Satyanarayanan*, June 2017.

- **Distinguished Poster Award at the 13th USENIX Symposium on Usable Privacy and Security (SOUPS)**, *with Norman Sadeh, Martin Degeling, Aerin Shikun Zhang, Alessandro Acquisti, Lujo Bauer, Lorrie Cranor, Anupam Datta, and Daniel Smullen*, July 2017.

- **Best Paper Award at the 9th ACM Symposium on Information, Computer and Communications Security (ASI-ACCS)**, *with Nikita Borisov, Prateek Mittal, and Matthew Caesar*, June 2014.

- **Symantec Research Labs Fellowship Finalist**, 2015.

- **Feng Chen Memorial award**, *University of Illinois at Urbana-Champaign*, 2015.

- **Fulbright Science and Technology Fellow**, 2010 – 2013.

- **Student Travel Grants** to CCS 2014, HotSoS 2014, ASIACCS 2014, FC 2013, PETS 2013, DIMACS 2013 and IEEE LCN 2010.

- **Academic merit scholarship in each of the eight semesters for outstanding result**, *Bangladesh University of Engineering and Technology*, 2003 – 2007.

PATENTS

- **U.S. Patent 9,143,452**. FlowComb: Boosting Big Data Processing with OpenFlow, *Cristian Lumezanu, Anupam Das, Yueping Zhang, Vishal Kumar Singh, Curtis Yu, Guofei Jiang*, September 22, 2015

- **U.S. Patent 20190108353**. Personalized Privacy Assistant, *Norman Sadeh, Bin Liu, Anupam Das, Martin Degeling, Florian Schaub*, April 11, 2019 (pending)

RESEARCH SUPPORT

- Title: **CRII: SaTC: Analyzing Information Leak in Smart Homes**
  Sponsor: **National Science Foundation**
  Total Award: $174,995

Duration: 2 years (June 01, 2019 – May 31, 2021)
Single PI

- Title: **Understanding People's Privacy Perceptions, Concerns and Preferences in Using Internet of Things (IoT) Technologies**
Sponsor: **NCSU FRPD**
Total Award: $10,000
Duration: 1 year (July 1, 2019 - June 30, 2020)
Single PI

PROFESSIONAL ACTIVITIES

Conference and Workshop Organization:
- Co-chair: ACM MMSys Special session on IoT and Smart cites: 2018.

Technical Program Committees:
- ACM Conference on Computer and Communications Security (CCS): 2017.
- ISOC Network and Distributed System Security Symposium (NDSS): 2020.
- Privacy Enhancing Technologies Symposium (PETS): 2019, 2020.
- International World Wide Web Conference (WWW): 2018.
- ACM Workshop on Privacy in the Electronic Society (WPES): 2019.
- IEEE CVPR Workshop on The Bright and Dark Sides of Computer Vision: Challenges and Opportunities for Privacy and Security (CV-COPS): 2018.

Reviewer (Journal and Magazine): ACM Transactions on the Web: 2017; ACM Transactions on Privacy and Security: 2017, 2018, 2019; IEEE Transactions on Dependable and Secure Computing: 2013; IEEE Transactions on Information Forensics and Security 2016, 2017, 2019; IEEE Pervasive Computing 2018; IEEE Transactions on Mobile Computing 2019; Elsevier Pervasive and Mobile Computing 2015;

Reviewer (Conference and Workshop): ACM Conference on Computer and Communications Security: 2011, 2012, 2014, 2015; IEEE Symposium on Security and Privacy: 2017; ISOC Networked and Distributed System Security Symposium: 2012, 2016; USENIX Security Symposium: 2012, 2013, 2016, 2017; USENIX Symposium on Usable Privacy and Security: 2017; International conference of Human-Computer Interaction (CHI): 2018; ACM Communications and Computer Networks (SigComm): 2014; IEEE Conference on Local Computer Networks (LCN): 2010; ACM Genetic and Evolutionary Computation Conference (GECCO): 2009;

PUBLICATIONS

JOURNAL PUBLICATIONS

1. Anupam Das, Nikita Borisov, and Edward Chou. Every move you make: Exploring practical issues in smartphone motion sensor fingerprinting and countermeasures. *Proceedings on Privacy Enhancing Technologies*, 2018(1):88–108, 2018.

2. Junjue Wang, Brandon Amos, Anupam Das, Padmanabhan Pillai, Norman M. Sadeh, and Mahadev Satyanarayanan. Enabling live video analytics with a scalable and privacy-aware framework. *ACM Transactions on Multimedia Computing, Communications and Applications (TOMM)*, 14(3s):64:1–64:24, 2018.

3. Joshua Juen, Aaron Johnson, Anupam Das, Nikita Borisov, and Matthew Caesar. Defending tor from network adversaries: A case study of network path prediction. *Proceedings on Privacy Enhancing Technologies*, 2015(2):171–187, 2015.

4. Anupam Das and Mohammad Mahfuzul Islam. SecuredTrust: A dynamic trust computation model for secured communication in multiagent systems. *IEEE Transactions on Dependable and Secure Computing (TDSC)*, 9(2):261–274, 2012.

PEER-REVIEWED CONFERENCE PUBLICATIONS

1. Anupam Das, Gunes Acar, Nikita Borisov, and Amogh Pradeep. The web's sixth sense: A study of scripts accessing smartphone sensors. In *Proceedings of the 25th ACM SIGSAC Conference on Computer and Communications Security (CCS)*, pages 1515–1532, October 2018. (Acceptance Rate: 16.6%).

2. William Melicher, Anupam Das, Mahmood Sharif, Lujo Bauer, and Limin Jia. Riding out DOMsday: Towards detecting and preventing DOM cross-site scripting. In *Proceedings of the 25th Annual Network and Distributed System Security Symposium (NDSS)*, February 2018. (Acceptance Rate: 21.5%).

3. Rashid Tahir, Muhammad Huzaifa, Anupam Das, Mohammad Ahmad, Carl Gunter, Fareed Zafar, Matthew Caesar, and Nikita Borisov. Mining on someone else's dime: Mitigating covert mining operations in clouds and enterprises. In *Proceedings of the 20th International Symposium on Research in Attacks, Intrusions and Defenses (RAID)*, pages 287–310, September 2017. (Acceptance Rate: 20.0%).

4. Junjue Wang, Brandon Amos, Anupam Das, Padmanabhan Pillai, Norman Sadeh, and Mahadev Satyanarayanan. A scalable and privacy-aware IoT service for live video analytics. In *Proceedings of the 8th ACM on Multimedia Systems Conference (MMSys)*, pages 38–49, June 2017. (Acceptance Rate: 26.0%).

5. Shouling Ji, Shukun Yang, Anupam Dasand Xin Hu, and Raheem Beyah. Password correlation: Quantification, evaluation and application. In *Proceedings of the 36th IEEE Annual International Conference on Computer Communications (INFOCOM)*, pages 1–9, May 2017. (Acceptance Rate: 20.9%).

6. Milijana Surbatovich, Jassim Aljuraidan, Lujo Bauer, Anupam Das, and Limin Jia. Some recipes can do more than spoil your appetite: Analyzing the security and privacy risks of IFTTT recipes. In *Proceedings of the 26th International World Wide Web Conference (WWW)*, pages 1501–1510, April 2017. (Acceptance Rate: 16.9%).

7. Anupam Das, Nikita Borisov, and Matthew Caesar. Tracking mobile web users through motion sensors: Attacks and defenses. In *Proceedings of the 23rd Annual Network and Distributed System Security Symposium (NDSS)*, February 2016. (Acceptance Rate: 15.4%).

8. Anupam Das, Nikita Borisov, and Matthew Caesar. Do you hear what I hear? Fingerprinting smart devices through embedded acoustic components. In *Proceedings of the 21st ACM SIGSAC Conference on Computer and Communications Security (CCS)*, pages 441–452, November 2014. (Acceptance Rate: 19.5%).

9. Anupam Das, Nikita Borisov, Prateek Mittal, and Matthew Caesar. Re^3: Relay reliability reputation for anonymity systems. In *Proceedings of the 9th ACM Symposium on Information, Computer and Communications Security (ASIACCS)*, pages 63–74, June 2014. (Acceptance Rate: 16.5%).

10. Anupam Das, Nikita Borisov, and Matthew Caesar. Analyzing an adaptive reputation metric for anonymity systems. In *Proceedings of the 1st ACM Symposium and Bootcamp on the Science of Security (HotSoS)*, pages 11:1–11:11, April 2014. (Acceptance Rate: 57.0%).

11. Anupam Das, Joseph Bonneau, Matthew Caesar, Nikita Borisov, and XiaoFeng Wang. The tangled web of password reuse. In *Proceedings of the 21st Annual Network and Distributed System Security Symposium (NDSS)*, February 2014. (Acceptance Rate: 18.6%).

12. Anupam Das and Nikita Borisov. Securing anonymous communication channels under the selective DoS attack. In *Proceedings of the 17th Financial Cryptography and Data Security (FC)*, pages 362–370, April 2013. (Acceptance Rate: 22.5%).

13. Anupam Das, Mohammad Mahfuzul Islam, and Golam Sorwar. Dynamic trust model for reliable transactions in multi-agent systems. In *Proceedings of the 13th IEEE International Conference on Advanced Communication Technology (ICACT)*, pages 1101–1106, February 2011. (Acceptance Rate: 42.8%).

14. Anupam Das and Mohammad Mahfuzul Islam. A novel feedback based fast adaptive trust model for P2P networks. In *Proceedings of the 35th IEEE Conference on Local Computer Networks (LCN)*, pages 552–559, October 2010. (Acceptance Rate: 30.2%).

15. Anupam Das and Saeed Muhammad Abdullah. Evolving multilayer neural networks using permutation free encoding technique. In *Proceedings of the 2009 International Conference on Artificial Intelligence (ICAI)*, pages 32–38, July 2009.

16. **Anupam Das**, Md. Shohrab Hossain, Saeed Muhammad Abdullah, and Rashed Ul Islam. Permutation free encoding technique for evolving neural networks. In *Proceedings of the 5th International Symposium on Neural Networks: Advances in Neural Networks (ISNN)*, pages 255–265, September 2008. (Acceptance Rate: 36.7%).

MAGAZINE ARTICLES

1. Anupam Das, Martin Degeling, Norman Sadeh, and Daniel Smullen. Personalized privacy assistants for the internet of things: Providing users with notice and choice. *IEEE Pervasive Computing*, 17(3):35–46, July 2018.

WORKSHOP PUBLICATIONS

1. Anupam Das, Martin Degeling, Xiaoyou Wang, Junjue Wang, Norman Sadeh, and Mahadev Satyanarayanan. Assisting users in a world full of cameras: A privacy-aware infrastructure for computer vision applications. In *Proceedings of the 30th IEEE Computer Vision and Pattern Recognition Workshops (CVPRW)*, pages 1387–1396, July 2017.

2. Primal Pappachan, Martin Degeling, Roberto Yus, Anupam Das, Sruti Bhagavatula, William Melicher, Pardis Emami Naeini, Shikun Zhang, Lujo Bauer, Alfred Kobsa, Sharad Mehrotra, Norman Sadeh, and Nalini Venkatasubramanian. Towards privacy-aware smart buildings: Capturing, communicating, and enforcing privacy policies and preferences. In *Proceedings of the 37th IEEE International Conference on Distributed Computing Systems Workshops (ICDCSW)*, pages 193–198, June 2017.

3. Anupam Das, Cristian Lumezanu, Yueping Zhang, Vishal Singh, Guofei Jiang, and Curtis Yu. Transparent and flexible network management for big data processing in the cloud. In *Proceedings of the 5th USENIX Workshop on Hot Topics in Cloud Computing (HotCloud)*, pages 1–6, June 2013.

POSTER ABSTRACTS

1. Norman Sadeh, Martin Degeling, Anupam Das, Aerin Shikun Zhang, Alessandro Acquisti, Lujo Bauer, Lorrie Cranor, Anupam Datta, and Daniel Smullen. A privacy assistant for the Internet of Things. In *the 13th USENIX Symposium on Usable Privacy and Security (SOUPS)*, July 2017. https://www.usenix.org/sites/default/files/soups17_poster_sadeh.pdf.

2. Anupam Das and Nikita Borisov. Fingerprinting smartphones through speakers. In *the 35th IEEE Symposium on Security and Privacy (SP)*, May 2014. http://www.ieee-security.org/TC/SP2014/posters/DASAN.pdf.

3. Giang T. K. Nguyen, Xun Gong, Anupam Das, and Nikita Borisov. PnP: Improving web browsing performance over tor using web resource prefetch-and-push. In *the 20th ACM Conference on Computer and Communications Security (CCS)*, November 2013. http://hatswitch.org/~nikita/papers/pnp-poster-ccs13.pdf.

TECHNICAL REPORTS

1. Anupam Das, Nikita Borisov, Edward Chou, and Muhammad Haris Mughees. Smartphone fingerprinting via motion sensors: Analyzing feasibility at large-scale and studying real usage patterns. *CoRR*, abs/1605.08763, May 2016. http://arxiv.org/abs/1605.08763.

2. Anupam Dasand Nikita Borisov and Matthew Caesar. Exploring ways to mitigate sensor-based smartphone fingerprinting. *CoRR*, abs/1503.01874, March 2015. http://arxiv.org/abs/1503.01874.

3. Anupam Das, Nikita Borisov, and Matthew Caesar. Fingerprinting smart devices through embedded acoustic components. *CoRR*, abs/1403.3366, March 2014. http://arxiv.org/abs/1403.3366.

4. Anupam Das and Nikita Borisov. Securing tor tunnels under the selective-DoS attack. *CoRR*, abs/1107.3863, July 2011. http://arxiv.org/abs/1107.3863.

THESES

1. Anupam Das. *Understanding and Mitigating the Privacy Risks of Smartphone Sensor Fingerprinting*. Ph.D. thesis, Department of Computer Science, University of Illinois at Urbana-Champaign, 2016.

2. Anupam Das. *Feedback Based Dynamic Trust Model for Secured Communication in Multi-agent Systems*. M.Sc. thesis, Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology, 2010.

3. Anupam Das. *Evolving Neural Networks using Evolutionary Algorithm*. B.Sc. thesis, Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology, 2008.

PUBLIC SPEAKING

INVITED TALKS

1. Every Move You Make: Tracking Smartphone Users through Motion Sensors (**keynote**), ACM IH&MMSec, Philadelphia, PA, June, 2017.
2. Tracking mobile web users through motion sensors: Attacks and defenses, Carnegie Mellon University (CMU), Pittsburgh, PA, October, 2016.
3. Tracking mobile web users through motion sensors: Attacks and defenses, University of California at Berkeley, Berkeley, CA, February, 2016.
4. Tracking mobile web users through motion sensors: Attacks and defenses, IBM T.J. Watson Research Center, Ossining, NY, February, 2016.
5. Tracking mobile web users through motion sensors: Attacks and defenses, Cornell University, Ithaca, NY, January, 2016.
6. Tracking mobile web users through motion sensors: Attacks and defenses, University of Illinois at Urbana-Champaign (UIUC), Urbana, IL, October, 2015.

PRESENTATATIONS

1. Assisting users in a world full of cameras: A privacy-aware infrastructure for computer vision applications. *1st International Workshop on The Bright and Dark Sides of Computer Vision: Challenges and Opportunities for Privacy and Security (CV-COPS)*, Honolulu, HI, July, 2017.
2. Tracking mobile web users through motion sensors: Attacks and defenses. *23rd Network and Distributed System Security Symposium (NDSS)*, San Diego, CA, February, 2016.
3. Do you hear what I hear? Fingerprinting smart devices through embedded acoustic component. *21st ACM Conference on Computer and Communications Security (CCS)*, Scottsdale, AZ, November, 2014.
4. Re^3: Relay reliability reputation for anonymity systems. *9th ACM Symposium on Information, Computer and Communications Security(ASIACCS)*, Kyoto, Japan, June, 2014.
5. Analyzing an adaptive reputation metric for anonymity systems. *1st ACM Symposium and Bootcamp on the Science of Security (HotSoS)*, Raleigh, NC, April, 2014.
6. The tangled web of password reuse. *21st Network and Distributed System Security Symposium (NDSS)*, San Diego, CA, February, 2014.
7. Securing anonymous communication channels under the selective-DoS attack. *17th Financial Cryptography and Data Security (FC)*, Okinawa, Japan, April, 2013.
8. A novel feedback based fast adaptive trust model for P2P networks. *35th IEEE Conference on Local Computer Networks (LCN)*, Denver, CO, October, 2010.

TUTORIALS

1. An overview of usable privacy technologies, tools and findings coming out of recent research at Carnegie Mellon University, *13th USENIX Symposium on Usable Privacy and Security (SOUPS)*, Santa Clara, CA, USA, July 2017. Joint tutorial with Norman Sadeh and Martin Degeling.

PANELS

1. The Web's Sixth Sense: A Study of Scripts Assessing Smartphone Sensors, *Federal Trade Commission's (FTC) annual PrivacyCon forum*, Washington D.C., June, 2019.