

Shubham SINGH

Ph.D. Student

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RESEARCH INTERESTS

Algorithmic Fairness

Machine Learning

Privacy and Security

Computational Social Science



EDUCATION

2019 - Present **Doctor of Philosophy, Computer Science**, University of Illinois at Chicago (UIC)
2016 **Bachelor of Technology, Computer Science**, Indraprastha Institute of Information Technology (IIIT), Delhi



PUBLICATIONS

- Tanya Berger-Wolf, Allison Howell, Chris Kanich, Ian A. Kash, Moniba Keymanesh, Barbara Kowalczyk, Gina Nicholson Kramer, Andrew Perrault, and **Shubham Singh**. Open problems in (un)fairness of the retail food safety inspection process. In *Proceedings of the Responsible Decision Making in Dynamic Environments Workshop*, Proceedings of Machine Learning Research. PMLR, 2022. to-appear.
- **Shubham Singh**, Bhuvni Shah, and Ian A. Kash. Fair decision-making for food inspections. *arXiv preprint*, September 2021.
- Mohammad Taha Khan, Christopher Tran, **Shubham Singh**, Dimitri Vasilkov, Chris Kanich, Blase Ur, and Elena Zheleva. Helping users automatically find and manage sensitive, expendable files in cloud storage. In *30th USENIX Security Symposium (USENIX Security 21)*. USENIX Association, August 2021.
- Rishabh Kaushal, **Shubham Singh**, and Ponnurangam Kumaraguru. NeXLink: Node Embedding Framework for Cross-Network Linkages Across Social Networks. In *Proceedings of NetSci-X 2020: Sixth International Winter School and Conference on Network Science*, pages 61–75, Cham, 2020. Springer International Publishing.
- **Shubham Singh**, Rishabh Kaushal, Arun Balaji Buduru, and Ponnurangam Kumaraguru. KidsGUARD: Fine Grained Approach for Child Unsafe Video Representation and Detection. In *Proceedings of the 34th ACM/SIGAPP Symposium on Applied Computing, SAC '19*, page 2104–2111, New York, NY, USA, 2019. Association for Computing Machinery.



RESEARCH

May 2022 Present	Research Intern, MAX PLANCK INSTITUTE FOR SOFTWARE SYSTEMS, Germany Mentors: Dr. Oshrat Ayalon, Dr. Elissa M. Redmiles <ul style="list-style-type: none">➤ Conducting online and in-lab studies to understand people's value of their digital accounts using behavioral economics and qualitative analysis.
January 2020 Present	Research Assistant, UNIVERSITY OF ILLINOIS AT CHICAGO, USA Mentors: Prof. Chris Kanich, Prof. Blase Ur <ul style="list-style-type: none">➤ Analysing the effect of ML-based decision making from the lens of algorithmic fairness for public health safety.➤ Analysed and coded user study data to understand how do users store sensitive and useful files on online cloud storage. Developed ML-based system to help users remove sensitive files from online cloud storage and reducing their risk of breach by 26%. Live app: cloudsweeper.app
October 2017 July 2019	Research Associate, PRECOG RESEARCH LAB, New Delhi Mentors: Prof. Ponnurangam Kumaraguru, Prof. Arun Balaji Buduru <ul style="list-style-type: none">➤ Applied deep learning models to detect unsafe content on video streaming platforms, making them 30% more safe for children.➤ Created node embedding framework for efficient cross-network representation of user profiles, beating the then state-of-the-art approach by 20%.➤ Studied the discriminative features of entity-specific sensitive information on the internet.

INDUSTRY

June 2016 September 2017	Full Stack Developer, TAPZO (ACQUIRED BY AMAZON PAY), Bengaluru Mentor: Adarsh Pandey <ul style="list-style-type: none">➤ Saved hundreds of hours in development cycle by building a generic cross-category coupons module for Android application, that was used by 7 other teams. Also, developed food, bill payment and hotel categories from scratch and launched to 5M users.➤ Wrote back-end services to track transaction state changes and user actions for providing better user reinforcements that improved user's post-transaction experience.
May 2015 July 2015	Application Developer Intern, MOBIKWIK, Gurgaon Mentor: Atul Goyal <ul style="list-style-type: none">➤ Migrated Android build environment from Maven to Gradle for better dependency management and faster build times.➤ Rewrote the application network layer for multi-thread performance and error handling to support low-bandwidth users.

TEACHING

August 2019 May 2021	Graduate Teaching Assistant, CS 361: COMPUTER SYSTEMS PROGRAMMING, University of Illinois at Chicago Mentor: Prof. Chris Kanich <ul style="list-style-type: none">➤ Designed, instructed, and evaluated programming labs and assignments for Computer Systems Programming course, taken by 180+ undergraduate students in both in-class and remote environments.➤ Received an average 4.48/5.0 in the evaluation feedback.
June 2018	Lab Instructor, SUMMER SCHOOL ON SOCIAL COMPUTING, IIIT-Hyderabad <ul style="list-style-type: none">➤ Conducted lab sessions for 50+ summer school participants on data collection using APIs, data analysis and constructing network graphs.➤ Made the tutorial code public at precog-iiitd/social-computing-18 .
January 2016 May 2016	Teaching Assistant, CSE 501: DESIGNING HUMAN CENTERED SYSTEMS, IIIT-Delhi Mentor: Prof. Ponnurangam Kumaraguru <ul style="list-style-type: none">➤ One of the select few undergraduate teaching assistants, for a class taken by 80+ undergraduate and graduate students.➤ Assisted in defining the course structure, designed and evaluated assignments and course projects.

SERVICE

NeurIPS 2021 Workshop	Algorithmic Fairness through the Lens of Causality and Robustness External - Reviewer
CSCW 2022	Reviewer

TALKS

July 2019	Cybersafety for Kids on Video Streaming Platforms , ACM Summer School on Cybersecurity and Data Analytics, IIIT-Delhi
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AWARDS & HONORS

June 2021	Graduate Student Service Award , UIC CSGSA. Received a certificate and award money.
Feb 2017	Employee of the Month , Tapzo (Acquired by Amazon-Pay). Received a certificate, public recognition, and a gift.
May 2016	Best Student Mentor , IIIT-Delhi. Received a certificate.

SKILLS

Programming Languages	Python, R, MATLAB, Java, JavaScript, C, C++
Frameworks	PyTorch, Keras, Numpy, Scikit, Flask, NodeJS, Celery, Android
Databases	MongoDB, MySQL, PostgreSQL
Tools	Git, Docker, VSCode, Vim, Sublime, Jupyter, IntelliJ, \LaTeX



ACTIVITIES AND VOLUNTEER WORK

- 2021-2022 **Volunteer**, Greater Chicago Food Depository
Food repacking volunteer at one of the largest food banks in Chicagoland.
- 2020-2022 **Treasurer, CSGSA**, UIC
Treasurer and organizer for various events for Computer Science graduate students at UIC.
- 2016 **Student Mentor**, IIIT-Delhi
Mentored 10+ freshman students for the academic and non-academic issues faced by them.
Received the **Best Student Mentor Award**.