

# 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

- **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

January 2020  
Present

**Research Assistant, UIC, Chicago**

**Mentors:** Prof. Chris Kanich, Prof. Blase Ur

- 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](https://cloudsweeper.app)

October 2017  
July 2019

**Research Associate, PRECOG RESEARCH LAB, New Delhi**

**Mentors:** Prof. Ponnurangam Kumaraguru, Prof. Arun Balaji Buduru

- 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

- 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	Application Developer Intern, MOBILKwik, Gurgaon
July 2015	<b>Mentor:</b> Atul Goyal <ul style="list-style-type: none"> <li>➤ Migrated Android build environment from Maven to Gradle for better dependency management and faster build times.</li> <li>➤ Rewrote the application network layer for multi-thread performance and error handling to support low-bandwidth users.</li> </ul>

## TEACHING

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

## SERVICE

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

## TALKS

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

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

## SKILLS

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

## ACTIVITIES AND VOLUNTEER WORK

2020	<b>Treasurer, CSGSA, UIC</b> Treasurer and organizer for various events for Computer Science graduate students at UIC.
2016	<b>Student Mentor, IIIT-Delhi</b> Mentored 10+ freshman students for the academic and non-academic issues faced by them. Received the <b>Best Student Mentor Award</b> .