

# Shubham SINGH

## Ph.D. Student

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## RESEARCH INTERESTS

Machine Learning Computational Social Science Privacy and Security Information Retrieval Network 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

- 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 EXPERIENCE

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|---------------------------|--|
| January 2020<br>Present   | <b>Research Assistant, UIC, Chicago</b><br><b>Mentors:</b> Prof. Chris Kanich, Prof. Blase Ur <ul style="list-style-type: none"><li>Developing ML-based system to help users remove sensitive files from online cloud storage and reducing their risk of breach by 26%.</li><li>Analysing the effect of ML-based decision making from the lens of algorithmic fairness for public health safety.</li></ul>   |
| October 2017<br>July 2019 | <b>Research Associate, PRECOG RESEARCH LAB, New Delhi</b><br><b>Mentors:</b> Prof. Ponnurangam Kumaraguru, Prof. Arun Balaji Buduru <ul style="list-style-type: none"><li>Applied deep learning models to detect unsafe content on video streaming platforms, making them 30% more safe for children.</li><li>Created node embedding framework for efficient cross-network representation of user profiles, beating the then state-of-the-art approach by 20%.</li><li>Studied the discriminative features of entity-specific sensitive information on the internet.</li></ul> |

## WORK EXPERIENCE

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|-----------------------------|--|
| June 2016<br>September 2017 | <b>Full Stack Developer, TAPZO (ACQUIRED BY AMAZON PAY), Bengaluru</b><br><b>Mentor:</b> Adarsh Pandey <ul style="list-style-type: none"><li>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.</li><li>Wrote back-end services to track transaction state changes and user actions for providing better user reinforcements that improved user's post-transaction experience.</li></ul> |
| May 2015<br>July 2015       | <b>Application Developer Intern, MOBILKwik, Gurgaon</b><br><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 EXPERIENCE

August 2019 December 2019	<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.</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>



## 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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## SELECTED PROJECTS

<b>MAGNUS</b>	2019
<b>Mentor:</b> Prof. Xinhua Zhang Used CNNs and Game tree to build a Chess-playing agent that could beat a random agent 84% of the time.	
<b>IMAGE INPAINTING</b>	2020
<b>Mentor:</b> Prof. Xinhua Zhang Validated GAN-based deep learning model and contextual loss function on a 200K image dataset to inpaint images with reconstruction defects.	
<b>SNOOKNOWS</b>	2015
<b>Mentor:</b> Prof. Ponnurangam Kumaraguru Developed a Django-based web application that uses NLP to fetch the public comments of real Reddit users and reports their vulnerability to online harassment. Accepted as a poster in <b>CERC Security and Privacy Symposium 2016, IIIT-Delhi</b> . <a href="https://github.com/shubhams/PSOSMProject">shubhams/PSOSMProject</a> <a href="https://cerc.iiitd.ac.in/spsymp16/agenda">cerc.iiitd.ac.in/spsymp16/agenda</a>	



## SKILLS

<b>Programming Languages</b>	Python, 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, Vim, Sublime, Jupyter, IntelliJ, $\LaTeX$



## 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 <b>Best Student Mentor Award</b> .