MUHAMMAD HASSAN

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RESEARCH PROFILE

I am dedicated to improving security and privacy in the Internet of Medical Things (IoMT) while also enhancing interoperability with other IoT and mobile apps systems. My research examines vulnerabilities related to data exposure and privacy concerns within digital technologies. Additionally, I analyze various online platforms, to understand user behavior patterns. This comprehensive approach informs the development of more secure and user-friendly technologies.

Keywords: Security, Privacy & Trust; Health Tech; Internet of Medical Things (IoMT); Mobile Apps.

EDUCATION

University of Illinois - Urbana Champaign UIUC *August 2022 - Present*
PhD in Information Science *CGPA 4.00*

University of Illinois at Chicago UIC *August 2020 - May 2022*
Master in Computer Science (Transfer to PhD UIUC) *CGPA 4.00*

Lahore University of Management Sciences LUMS *August 2016 - May 2020*
Bachelor in Computer Science

PROFESSIONAL EXPERIENCE

University of Illinois *Dec 2020 - present (IL, USA)*
Ph.D. Research Assistant - Conducting security and privacy analyses of health technologies, including mobile, web, and IoT systems, to protect users' data rights. My work involves data and text mining to analyze social networks and infer user behavior patterns, with a specific focus on the Internet of Medical Things (IoMT) and its interoperability with other IoT systems.

Discovery Partner Institute *June 2024 - Dec 2024 (Chicago IL)*
Graduate Research Intern - Concentrated on multi-language privacy policies comparison. Initiated the development of a pipeline to collect privacy policies in Chinese, Japanese, and Korean, resulting in over 2,400 policies and more than 5 million tokens, revealing limited level of compliance with local privacy regulations.

ByteDance/TikTok Inc. *May - August 2022 (Chicago IL)*
PhD Research Intern - Improved security and performance of sensitive applications with Intel SGX and Hashicorp Vault in collaboration with Application Security team.

RESEARCH PAPERS

Conference Papers:

- **Designing for Transparency: A Multilingual Analysis of Privacy Policy Usability and Compliance in Chinese, Japanese, and Korean Contexts**. Muhammad Hassan, Masooda Bashir, and Yuanye Ma. In *International Conference on Human-Computer Interaction*, vol. 63, CCIS 2525 of the HCII 2025 proceedings.

- **Listening to Users: Privacy and Security in Mobile Health Apps**. Muhammad Hassan, Masooda Bashir, and Ian Brooks. In *International Conference on Human-Computer Interaction 2025*, vol. 59, LNCS 15824 of the HCII 2025 proceedings.

- **Unveiling Privacy Measures in Mental Health Applications**. Muhammad Hassan and Masooda Bashir. In *Adjunct Proceedings of the 2023 ACM International Joint Conference on Pervasive and Ubiquitous Computing & the 2023 ACM International Symposium on Wearable Computing*, pp. 648-654. 2023, Cancun, Quintana Roo, Mexico. ACM UbiComp/ISWC Mental Health: Sensing & Intervention - MHSI 2023.

- **Evaluating User Behavior in Smartphone Security: A Psychometric Perspective**. Hsiao-Ying Huang, Soteris Demetriou, Muhammad Hassan, Güliz Seray Tuncay, Carl A. Gunter, and Masooda Bashir. In *Nineteenth Symposium on Usable Privacy and Security (SOUPS 2023)*, pp. 509-524. 2023, Anaheim, CA. [Slides]

- [An Exploratory Study of Malicious Link Posting on Social Media Applications](). Muhammad Hassan, Mahnoor Jameel, and Masooda Bashir. In *Proceedings of the Symposium on Usable Security and Privacy (USEC 2023)*, (co-located with NDSS'23). February 2023, San Diego, California.

Poster:

- **Multilingual Compliance: A Comparative Study of Privacy Policies in Chinese, Japanese, and Korean**. In *NeurIPS 2024 Workshop on Regulatable ML*.

Under Submission:

- **Privacy and Security in FemTech Apps (Title Changed for Anonymity)**. Under Submission. [arXiv]

Preprints:

- **Decoding User Concerns in AI Health Chatbots: An Exploration of Security and Privacy in App Reviews** arXiv Link

- **Towards Characterizing COVID-19 Awareness on Twitter** (Dataset Paper) arXiv Link

NOTABLE RESEARCH PROJECTS

Health Technologies:

- **Usable Security and Privacy of IoMT devices**
  Investigating the usability, privacy, and security challenges encountered by users across various age groups, with a particular focus on elderly users (aged 65+). This research aims to enhance user experience and safeguard sensitive information when interacting with Internet of Medical Things (IoMT) devices.

- **Characterizing the Security and Privacy Behavior of the Mobile Health Application**
  Developing frameworks to identify security and privacy vulnerabilities, including covert user tracking on smartphones, aimed at uncovering data leaks and potential infringements on user privacy and security.

- **Security and Privacy Challenges of IoMT Ecosystem**
  Identifying critical security and privacy challenges within the IoMT landscape, including compliance with regulatory standards and the complexities of integrating diverse medical devices.

- **Security and Privacy Discourse in Online Development Communities**
  Conducting analysis of discussions among developers and domain experts on platforms such as GitHub to identify prevalent security and privacy concerns, thereby informing best practices and enhancing community awareness.

Other Security and Privacy Research:

- **Secret Management using Zero-Trust**
  Using Intel SGX remote attestation to securely deploy secret management inside secure enclaves to provide zero trust infrastructure for workload.

- **Fingerprinting and Tracking via Progressive Web Apps (PWAs)**
  Despite API restrictions in PWAs & service workers, our study finds that they are vulnerable to novel approaches that could help carry out traditional fingerprinting activities.

SERVICES

External Reviewer

- ACM SIGCHI & Case Studies 2025
- NeurIPS 2024 Workshop on Regulatable ML
- Artifact Evaluation of the Network and Distributed System Security Symposium 2024
- ACM SIGCHI - Extended Abstract & Case Studies 2024
- UbiComp/ISWC 2023 Posters and Demos

Undergraduate Research Symposium

- Program Committee, UIUC URP, 2023 & 2024

- Undergraduate Research Mentor (2023-Present) [Web]

TEACHING EXPERIENCE

PhDg Teaching Assistant @UIUC *August 2022 - December 2024*

Assisted with instruction and grading for Privacy and Information Technology, System Infrastructure Design and HCI classes.

PhD Teaching Assistant@UIC *Jan 2021 - May 2022*

Assisted with Data Structures class of 150+ students, performing my duties as lab instructor for practical learning, conducted mock coding interviews, and grading of the course components.

TECHNICAL SKILLS

Programming Languages	C/C++, Python, Java, JavaScript, MATLAB
Data Analysis & Visualization	R, Microsoft Excel, Tableau, Microsoft Power BI
Security	Pen Testing, Wireshark, Reverse Engineering, Linux, Intel SGX, Hashicorp Vault, Networking (TCP/IP, BGP, etc)
Technical	Docker, Firebase, Git, REST APIs, Adobe XD, HTML5 & CSS

REFERENCES

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