

Hafiz Asif | Curriculum Vitae

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Research Interests: Data Privacy, Equity and Fairness in Data Science and Machine Learning

Education

Ph.D. in Information Systems

Rutgers University, New Jersey, USA

2014–2021

Dissertation Topic: "Privacy or Utility? How to Preserve Both in Outlier Analysis"

Advisors: Jaideep Vaidya and Periklis A. Papakonstantinou

B.S. Computer Science

Lahore University of Management Sciences (LUMS), Lahore, Pakistan

2010–2014

Professional Experience

Post-Doctoral Associate

Rutgers Institute for Data Science, Learning, and Applications, New Jersey, USA

2021 - present

Research and development of fair, privacy-preserving, and practically-useful learning and analytics solutions for healthcare and bioinformatics domain

Post-Doctoral Fellow

INRIA (the National Institute for Research in Digital Science and Technology), France

2021

Research was focused on solving privacy-preserving machine learning and data analytical problems (*I had to leave due to pandemic-related reasons*)

Summer Internship

7 Vals, Lahore Pakistan

2012

Responsibility: document the security & privacy issues of (then emerging) NFT technology and its use in smartphones

Publications

Selected Publications

- "Preserving Missing Data Distribution in Synthetic Data"
Xinyue Wang, **Hafiz Asif**, Jaideep Vaidya
The ACM Web Conference (**WWW**), 2023 (under review)
- "A Study of Users' Privacy Preferences for Data Sharing on Symptoms-Tracking/Health App"
Hafiz Asif and Jaideep Vaidya
20th Workshop on Privacy in the Electronic Society (**WPES '22**, included in the CCS '22 proceedings)
- "Intelligent Pandemic Surveillance via Privacy-Preserving Crowdsensing"
Hafiz Asif, Periklis Papakonstantinou, Stephanie Shiau, Vivek Singh, Jaideep Vaidya
IEEE Intelligent Systems, 2022
- "Privacy Attitudes and COVID Symptom Tracking Apps: Understanding Active Boundary Management by Users"
Jinkyung Park, Eiman Ahmed, **Hafiz Asif**, Jaideep Vaidya, Vivek Singh
International Conference on Information (**iConference**), 2022
- "Identifying Anomalies while Preserving Privacy"
Hafiz Asif, Periklis A. Papakonstantinou, and Jaideep Vaidya
IEEE Transactions on Knowledge and Data Engineering (**TKDE**), 2021
- "A Guide to Private Outlier Analysis"
Hafiz Asif, Periklis A. Papakonstantinou, and Jaideep Vaidya
IEEE Letters of the Computer Society (**LOCS**), 2020

- “How to Accurately and Privately Identify Anomalies”
Hafiz Asif, Periklis A. Papakonstantinou, and Jaideep Vaidya
ACM Conference on Computer and Communications Security (**CCS**), 2019

Other Publications.....

- “Secure and Efficient k -NN Queries”
Hafiz Asif, Jaideep Vaidya, Basit Shafiq, and Nabil Adam
IFIP International Conference on ICT Systems Security and Privacy Protection (**IFIP-SEC**), 2017
- “Collaborative Differentially Private Outlier Detection for Categorical Data”
Hafiz Asif, Tanay Talukdar, Jaideep Vaidya, Basit Shafiq, and Nabil Adam
IEEE International Conference on Collaboration and Internet Computing (**CIC**), 2016
- “A Privacy-Sensitive Collaborative Approach to Business Process Development”
Hassaan Irshad, Basit Shafiq, Jaideep Vaidya, M. Ahmed Bashir,
Hafiz Asif, Sameera Ghayyur, Shafay Shamail, and Nabil Adam
International Conference on E-Business and Telecommunications (**ICETE**), 2015

Under Preparation (manuscript available at request).....

- “Computing Accurate Differentially Private Statistics over Spatial-Data Stream via Minimally Thick \mathbb{Z} -Covering Interval Families”
Hafiz Asif, Endre Boros, and Jaideep Vaidya
- “How Missing Data and its Treatment Affects Fairness”
Sitao Min, **Hafiz Asif** and Jaideep Vaidya
- “Stronger Security by Data-Duplication: Secure and Efficient Information Retrieval in the Presence of Covert Adversary”
Hafiz Asif and Jaideep Vaidya

Systems

Covid Nearby, a Privacy-Preserving Symptoms Crowdsensing and Reporting

Supported by NSF, NIH, and Rutgers University [<https://covidnearby.org>] 2020
At the outset of the COVID-19 pandemic, the population testing was low, which led to the lack of crucial information needed to track the spread of the virus in communities. Thus, to generate real-time information about the spread of the virus, in a multi-school collaborative effort, designed a powerful privacy-preserving COVID-19 symptoms crowdsensing and reporting system, and through a fast-paced development, deployed it via a suite of web, Android, and iOS apps for the public use as well as research.

Teaching

Lecturer

Cybersecurity, Rutgers University, New Jersey, USA Fall 2018

Teaching Assistant

Rutgers University, New Jersey, USA 2014–2018
Data Privacy, Information Security, Data Mining, Databases, Introduction to Programming.

Summer School Instructor for Data Privacy

Center for Information Management, Integration and Connectivity, New Jersey, USA 2015 & 2016

Teaching Assistant and Lab Instructor

Lahore University of Management Sciences (LUMS), Lahore, Pakistan 2012–2014
Advanced Programming, Computational Problem Solving, Operating Systems, and Calculus

Seminars, Talks, and Other Activities

- *Users' Privacy Predilections on Symptoms-Tracking Apps* 2021
 - Workshop on Privacy in the Electronic Society (WPES) 2022, Los Angeles, USA
- *Accurately and Privately Reporting Crowdsensed COVID-19 Data (podium abstract)* 2021
 - AMIA (American Medical Informatics Association) Annual Symposium, San Diego, USA
- *Workshop for Security, Privacy, and Ethics in Health and Biomedical Research* 2021
 - Online, USA
- *The Pandemic Research for Preparedness and Resilience (PREPARE) Workshop* 2020
 - Online, USA
- *Sensitive Privacy – An Intricate Balance of Privacy and Utility for Outlier Queries* 2020
 - INRIA, Palaieau, France
 - IBM Thomas J. Watson Research Center, New York, USA
- *How to Accurately and Privately Identify Anomalies* 2019
 - ACM Conference on Computer and Communications Security (CCS), London, UK
- *How to Think about Privacy for Outlier Analysis* 2019
 - CS department, Lahore University of Management Sciences, Pakistan
- *Algorithms for Privacy-Preserving Anomaly Identification* 2019
 - Rutgers-NJIT seminar, Rutgers University, NJ, USA
- *Outlier Detection and Privacy* 2018
 - The New York Colloquium on Algorithms and Complexity (NYCAC), CUNY, USA
- *Collaborative Differentially Private Outlier Detection for Categorical Data.* 2016
 - IEEE Conference on Collaboration and Internet Computing, Pittsburgh, USA

Research Fellowships

Research Assistant

Rutgers University, New Jersey, USA 2018–2020

Research Associate

Center for Information Management, Integration and Connectivity, New Jersey, USA 2014–2018

Research Assistant

Lahore University of Management Sciences, Lahore, Pakistan 2013–2014

Distinctions and Fellowships

- Graduate Assistanceship (Rutgers University) 2014–2020
- Recipient of:
 - Competitive National Outreach Program's fellowship award by LUMS 2010–2014
 - BAF fellowship award by the Babar Ali Foundation, Pakistan 2010–2014
 - Competitive PEEF scholarship award by the provincial govt. of Pakistan 2009–2014
- Nationwide ranked 1st in admission exams of GIKI & PIEAS, prestigious Pakistani universities 2010

Grants

- Experience with grant writing:
 - Co-wrote and submitted NIH R01 proposal for \$1.5 million over 5 years (under revision) 2022
 - Co-wrote a successful NSF RAPID Grant for privacy-preserving crowdsensing of COVID-19 for ~\$200K 2020

- Recipient of travel grants by:
 - ACM Conference on Computer and Communications Security (**CCS**) 2019
 - IEEE International Conference on Collaboration and Internet Computing (**CIC**) 2016
- Recipient of Dean's Summer Research Grant (Rutgers Business School) 2015 & 2016

Professional Service

- Publicity Chair for Conference on Data and Applications Security and Privacy 2022 (DBSec'22)
- Organized the Workshop for Security, Privacy, and Ethics in Health and Biomedical Research
- *Program Committee Member* for: The ACM Web Conference (*WWW*), Data and Applications Security and Privacy (*DBSec*), European Symposium on Research in Computer Security (*ESORICS*), Workshop on Privacy in the Electronic Society (*WPES*, affiliated with *CCS*), AI for Cybersecurity (affiliated with *AAAI*)
- *Reviewer* for: Association for the Advancement of Artificial Intelligence (*AAAI*), Conference on Knowledge Discovery and Data Mining (*KDD*), Conference on Data and Application Security and Privacy, International Conference on Distributed Computing Systems (*ICDCS*), and International Symposium on Algorithms and Computation (*ISAAC*)

Media Mentions

- "Privately Identify and Help Track the Spread of COVID-19 with COVID Nearby", IEEE Computer Society
- "Tracking COVID-19 with a new app that assures user privacy", RBS News and New Jersey Alliance for Clinical and Transnational Science