Abdullah Al Omar

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Education

University of Alberta *Alberta, Canada*
MASTER OF SCIENCE [THES.] IN COMPUTING SCIENCE *2022 - 2024*

- CGPA- 3.70/4.0
- Advised by Dr. Euijin Choo and Dr. Omid Ardakanian
- **Recipient of Graduate Recruitment Scholarship University of Alberta (2022)**

University of Asia Pacific *Dhaka, Bangladesh*
BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND ENGINEERING *2012-2016*

- CGPA: 3.96/4.0
- **Distinction:** Vice Chancellor's **Gold Medalist**

Work Experience

University of Alberta & HCLTech *Edmonton, Canada*
GRADUATE ASSISTANT & MITACS ACCELERATE INTERN *Sept 2022 - Dec 2024 [2 years+]*

- **Efficient Privacy-Preserving Cross-Silo Federated Learning with Multi-Key Homomorphic Encryption**
  Research Coding (Python): Implemented a Federated Learning system using the Flower framework, incorporating Multi-key Homomorphic Encryption. Explored the combination of model sparsification with homomorphic encryption, reducing communication and computation overhead by up to 8× for MKHE-based FL.
- A paper based on this project is under review at The Annual Computer Security Applications Conference (ACSAC) 2025. Also available at: `https://arxiv.org/abs/2505.14797`

University of Asia Pacific *Dhaka, Bangladesh*
LECTURER (ON LEAVE) *Apr 2017 - July 2022 [5 years+]*

- Course Conducted: Algorithms, Algorithms Lab, Software Engineering, Peripheral and Interfacing, Peripheral and Interfacing Lab, Operating Systems, Data Structure Lab
- Research Experience: In these 5 years, published 4 international journal papers and 8 international conference papers on techniques to preserve user privacy utilizing new technology
- Notable publication having more than 400 citations- *"Privacy-friendly platform for healthcare data in cloud based on blockchain environment"*

Leveraging ICT(LICT), ICT Division, Government of Bangladesh *Dhaka, Bangladesh*
BLOCKCHAIN TRAINER *Jun 2020 - Sep 2020 [4 months]*

- Blockchain Trainer (Ethereum) for the top 15 teams of Bangladesh Blockchain Olympiad-2020

Research Experience

PUBLISHED SEVERAL PAPERS BASED ON INTERNATIONAL COLLABORATIONS *2015- 2025*

- Google Scholar: Citations- 1200+, h-index- 11, i10-index- 11
- Research Experience of 10 years
- Notable Venues: Future Generation Computer Systems, IEEE Transactions on Network Science and Engineering, IEEE Transactions on Engineering Management, International Conference on Security, Privacy and Anonymity in Computation, IEEE Intl Conf on Dependable, Autonomic and Secure Computing

Research Publications

Google Scholar Citations: 1200+ till May 2025

Under Review

TOTAL 01

- U1. **Abdullah Al Omar**, Xin Yang, Euijin Choo, Omid Ardakanian. *"Efficient Privacy-Preserving Cross-Silo Federated Learning with Multi-Key Homomorphic Encryption."*
  Under review in The Annual Computer Security Applications Conference (ACSAC) 2025.
  Also available at: `https://arxiv.org/abs/2505.14797`

Peer Reviewed Journal

Total 04

- J4. **IEEE Access 2021**- **Abdullah Al Omar**, Abu Kaisar Jamil, Amith Khandakar, Abdur Razzak Uzzal, Rabeya Bosri, et.al "A Transparent and Privacy-preserving Healthcare Platform with Novel Smart Contract for Smart Cities", IEEE Access 9 (2021): 90738-90749

- J3. **IEEE TNSE 2020**- Rabeya Bosri, Md. Shariar Rahman, Md Zakirul Alam Bhuiyan, **Abdullah Al Omar*** "Integrating Blockchain with Artificial Intelligence for Privacy-Preserving in Recommender Systems", IEEE Transactions on Network Science and Engineering (2020)

- J2. **IEEE TEMS 2020** - Mohammad Shahriar Rahman, **Abdullah Al Omar**, Md Zakirul Alam Bhuiyan, Anirban Basu, Shinsaku Kiyomoto, Guojon Wang. "Accountable cross-border Data Sharing Using Blockchain under Relaxed Trust Assumption" IEEE Transactions on Engineering Management (2020)

- J1. **FGCS 2019**- **Abdullah Al Omar**, Md Zakirul Alam Bhuiyan, Anirban Basu, Shinsaku Kiyomoto, and Mohammad Shahriar Rahman. "Privacy-friendly platform for healthcare data in cloud based on blockchain environment." Future Generation Computer Systems (2019).

Conference/Workshop

Total 12

- C12. Hanif Bhuiya, MD Abdul Karim, Jinat Ara, **Abdullah Al Omar**, Saharul Islam, Faria Benta Karim, and Guido Governatori. "Matrib leaf classification using Deep Neural Network: An Integrated Image Processing Technique." In 2022 IEEE Region 10 Symposium (TENSYMP), pp. 1-6. IEEE, 2022.**(TENSYMP 2022)**

- C11. Paul, Sourav, SM Rafi Alam, Md Orun Sunny, Shaila Rahman, and **Abdullah Al Omar**. "Image Analysis using Deep Learning for a Smart Traffic Control System." In Proceedings of the 2nd International Conference on Computing Advancements, pp. 126-132. 2022. **(ICCA 2022)**

- C10. Wahid Sadique Koly, Abu Kaisar Jamil, Mohammad Shahriar Rahman, Hanif Bhuiyan, Md Zakirul Alam Bhuiyan, and **Abdullah Al Omar***. "Towards a Location-Aware Blockchain-Based Solution to Distinguish Fake News in Social Media." In Inernational Conference on Ubiquitous Security, pp. 116-130. Springer, Singapore, 2021.**(UbiSec 2021)**

- C9. **Abdullah Al Omar*** Abu Kaisar Jamil, Md Shakhawath Hossain Nur, Md Mahamudul Hasan, Rabeya Bosri, Md Zakirul Alam Bhuiyan, and Mohammad Shahriar Rahman. "Towards A Transparent and Privacy-preserving Healthcare Platform with Blockchain for Smart Cities." In 2020 IEEE 19th International Conference on Trust, Security and Privacy in Computing and Communications, pp. 1291-1296. IEEE, 2020. **(TrustCom 2020)**

- C8. Rabeya Bosri, Abdur Razzak Uzzal, **Abdullah Al Omar***, Md Zakirul Alam Bhuiyan, Mohammad Shahriar Rahman. "HIDEchain: A User Centric Secure Edge Computing Architecture for Healthcare IoT Devices." In 2020 IEEE International Conference on Computer Communications WKSHPS (**INFOCOM 2020)**

- C7. Jinat Ara, Md Toufique Hasan, **Abdullah Al Omar**, Hanif Bhuiyan. "Understanding Customer Sentiment: Lexical Analysis of Restaurant Reviews" 2020 IEEE Region 10 Symposium **(TENSYMP 2020)**

- C6. Rabeya Bosri, Abdur Razzak Uzzal, **Abdullah Al Omar***, A S M Touhidul Hasan, Md Zakirul Alam Bhuiyan. "Towards a Privacy-Preserving Voting System Through Blockchain Technologies." In 2019 IEEE Intl Conf on Dependable, Autonomic and Secure Computing (DASC), pp. 602-608. IEEE, 2019. **(DASC 2019)**

- C5. Md. Shahin Uddin Talukder, Nabil Islam, Shaila Sharmin, **Abdullah Al Omar***, Sakib Hasan. "Bringing a Change in Digital Mobile Banking through Distributed Technology" In the International Joint Conference on Computational Intelligence **(IJCCI 2019)**

- C4. **Abdullah Al Omar***, Rabeya Bosri, Mohammad Shahriar Rahman, Nasima Begum, Md Zakirul Alam Bhuiyan. "Towards Privacy-preserving Recommender System with Blockchains." In International Conference on Dependability in Sensor, Cloud, and Big Data Systems and Applications, pp. 106-118. Springer, Singapore, 2019. **(DependSys 2019)**

- C3. Maisha Afrida Tasnim, **Abdullah Al Omar***, Mohammad Shahriar Rahman, and Md Zakirul Alam Bhuiyan. "CRAB: Blockchain Based Criminal Record Management System." In International Conference on Security, Privacy and Anonymity in Computation, Communication and Storage, pp. 294-303. Springer, Cham, 2018. **(SpaCCS 2018)**

- C2. **Abdullah Al Omar***, Mohammad Shahriar Rahman, Anirban Basu, and Shinsaku Kiyomoto. "MediBchain: A Blockchain Based Privacy Preserving Platform for Healthcare Data." In International Conference on Security, Privacy and Anonymity in Computation, Communication and Storage, pp. 534-543. Springer, Cham, 2017. (**SpaCCS 2017)**

- C1. Jahir Ibna Rafiq, **Abdullah Al Omar**, Animesh Chakraborty, and Albub Yusuf. "Adaptive secured multicast key management with re-keying process." In IEEE Conference on Systems, Process and Control, pp. 181-185. IEEE. (**ICSPC 2016)**

Peer Reviewed Book Chapter

Total 01

- B1. Joy, Sk Yeasin Kabir, Md Nafees Imtiaz Ahsan, Nuzhat Tabassum Progga, Aloke Kumar Saha, Mohammad Shahriar Rahman, and **Abdullah Al Omar***. "An Anti-Counterfeiting Architecture Ensuring Authenticity and Traceability for Expensive Medicines Using QR Codes." In Blockchain Technology for IoE, pp. 211-238. CRC Press, 2023.

Skills

Expertise	Privacy-preserving Machine Learning, Applied Cryptography, Blockchain
Languages	Python, Solidity, C++, Java
Database	MySQL
Hardware	Arduino, Raspberry Pi, Proteus
Others	Ethereum Wallet, Distributed APP, System Design, Database design, Android Apps

Selected Academic Honors

2022	**Recruitment Scholarship**, Top students get the recruitment scholarship	*Edmonton, Canada*
2018	**Gold Medalist**, Vice Chancellor's List in 8th convocation of University of Asia Pacific	*Dhaka, Bangladesh*
2012-2016	**Vice Chancellor's Award for 7 semesters**, University of Asia Pacific	*Dhaka, Bangladesh*
2014	**Dean's Award**, Unviersity of Asia Pacific	*Dhaka, Bangladesh*

Program Organization

2021	**Organizing Member**, International Blockchain Olympiad- IBCOL	*Dhaka, Bangladesh*
2021	**Juror, Mentor, and Organizing member**, Blockchain Olympiad Bangladesh- BCOLBD	*Dhaka, Bangladesh*
2020	**Juror, Mentor, and Organizing member**, Blockchain Olympiad Bangladesh- BCOLBD	*Dhaka, Bangladesh*
2017	**Organizing Member**, 20th International Conference on Computer and Information Technology	*Dhaka, Bangladesh*
2017	**Organizing Member**, International Collegiate Programming Contest	*Dhaka, Bangladesh*
2016	**Organizing Member**, International Collegiate Programming Contest	*Dhaka, Bangladesh*

International Presentation/Talks

Blockchain Olympiad Bangladesh *Dhaka, Bangladesh*
KEYNOTE SPEAKER *TBH.- 24th July, 2024*
- Presentation on "Towards A Privacy-Preserving Voting System Through Blockchain Technologies"

IEEE Intl Conf on Dependable, Autonomic and Secure Computing *Fukuoka, Japan*
PRESENTER *2019*
- Presentation on "Towards A Privacy-Preserving Voting System Through Blockchain Technologies"

In Intl Conf on Security, Privacy and Anonymity in Computation, Communication and Storage *Guangzhou, China*
PRESENTER *2017*
- Presentation on "MediBchain: A Blockchain based Privacy Preserving Platform for Healthcare Data"

Professional Services

June 2023 **Reviewer**, Blockchain: Research and Applications, Elsevier- Online ISSN: 2666-9536
Mar 2021 **Reviewer**, IEEE Transactions on Services Computing- (ISSN: 1939-1374)
Nov 2020 **Reviewer**, A manuscript on Differential Privacy, IEEE ACCESS- (ISSN: 2169-3536)
Jun 2020 **Reviewer**, Journal of Mobile Multimedia- (ISSN: 1550-4646)
May 2020 **Reviewer**, Journal of Electronic Science and Technology- Elsevier (ISSN: 1674-862X)
Jan 2020 **Reviewer**, IEEE ACCESS – (ISSN: 2169-3536)

References

Dr. Euijin Choo	Dr. Omid Ardakanian
Supervisor	Co-Supervisor
Assistant Professor	Associate Professor
Computing Science	Computing Science
University of Alberta	University of Alberta
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