MOONTAHA NISHAT CHOWDHURY

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PersonalWebsite

RESEARCH INTERESTS

Privacy-Preserving Computing, Cryptography, Distributed Decentralized Learning, Human Computer Interaction, and Machine Learning

EDUCATION

Ahsanullah University of Science and Technology (AUST) Dhaka, Bangladesh
B.Sc. in Computer Science and Engineering *April 2017 - January 2022*
CGPA: **3.798**/4.00

PUBLICATIONS [GOOGLE SCHOLAR]

1. **Moontaha Nishat Chowdhury**, André Bauer, and Minxuan Zhou. "Efficient Privacy-Preserving Recommendation on Sparse Data using Fully Homomorphic Encryption." *21st IEEE International eScience Conference* (eScience2025) (**Best Student Paper Award Winner**).
2. **Moontaha Nishat Chowdhury**, H. M. Haque, Kazi Taqi Tahmid, Fatema-Tuz-Zohora Salma, and Nafisa Ahmed. "A Novel Approach for Product Recommendation Using Smartphone Sensor Data." *International Journal of Interactive Mobile Technologies* 16, no. 16 (2022).
3. Kazi Taqi Tahmid, Khandaker Rezwan Ahmed, **Moontaha Nishat Chowdhury**, Koushik Mallik, Umme Habiba, and HM Zabir Haque. "An Integrated Crowdsourcing Application for Embedded Smartphone Sensor Data Acquisition and Mobility Analysis." *Journal of Advances in Information Technology* Vol 13, no. 5 (2022).

RESEARCH EXPERIENCE

Volunteer Research Assistant (Supervisor: Dr. Minxuan Zhou) October 2024 - Current

`Illinois Institute of Technology, Department of Computer Science` Chicago, Illinois

- Developed algorithms for an end-to-end Privacy Preserving Recommendation Framework exploiting **Fully Homomorphic Encryption and SIMD optimization** to solve the critical sparsity challenge of Matrix Factorization. Accepted in the 21st IEEE International eScience Conference (eScience'25).
- Ongoing Project: FHE-based Transformer framework for distributed decentralized learning.

PROFESSIONAL EXPERIENCE

Lecturer, Department of CSE January 2022 - August 2024
`Ahsanullah University of Science and Technology (AUST)` Dhaka, Bangladesh

- Conducted Data Structures, Digital Image Processing, Numerical Methods and Computer Programming, Elementary Structured Programming courses
- Served on the curriculum committee: **OBE(Outcome Based Education)**

TECHNICAL SKILLS

- **Languages**: Python, Java, C/C++, SQL, Oracle (PL/SQL), HTML/CSS, PHP
- **Privacy-Preserving Machine Learning Framework**: OpenFHE, Concrete, TenSEAL
- **Machine Learning:** PyTorch, TensorFlow, pandas, NumPy, Matplotlib, scikit-learn, SciPy, keras
- **Frameworks**: Bootstrap, Asp.net, Android Studio
- **Tools**: Git, Visual Studio, PyCharm, Jupyter Notebook, Colab, Code Blocks, Arduino, Matlab, LaTex

LINGUISTIC PROFICIENCY

- English `(IELTS Band Score: 7)`
- Bengali `(Native Speaker)`

UNDERGRADUATE THESIS

Title: ***Prediction of Product Interest by Observing Users' Preferences and Smartphone Sensor Data***
Supervisor: H M Zabir Haque, Assistant Professor, Dept. of CSE, AUST
Summary: Developed a novel real-time product recommendation system that exploits smartphone sensor data to capture users' daily activeness and correlate it with product preferences. Designed and implemented an Android application to collect embedded sensor data (e.g., GPS, accelerometer) and user interactions, applied machine learning techniques for activity-based clustering, and integrated hybrid recommendation methods (collaborative and content-based filtering). The proposed system demonstrated a precision of 66% without requiring explicit user feedback, highlighting the potential of implicit behavioral signals for personalized retail recommendations.

PROJECTS

Ongoing Projects

- Fully Homomorphic Encryption-based Transformer framework for end-to-end privacy preserving inference (*Framework: OpenFHE, Concrete*)
- Distributed Decentralized Learning with Privacy-Preserving Machine Learning (*Language*: Python, C++)
- Optimizing batching algorithms for encrypted Sparse Matrix Factorization with SIMD Operations (*Framework*: TensEAL (Python wrapper of Microsoft SEAL))

Past Projects

- Human Activity Analysis for Product Recommendation Using Smartphone Sensor Data (*Library*: PyTorch)
- Prediction of COVID-19 from chest X-ray images using Deep Transfer Learning (*Library*: PyTorch)
- Book Recommendation System (*Language*: Python)
- Disk Scheduling Algorithm Simulator (*Platform*: Oracle PL/SQL)
- Medi Minder (Medicine Reminder: Hardware Project) *Components*: Arduino Mega 2560, RTC (Real Time Clock for Alarm), Servo Motor, Ultrasonic sensor, Heartbeat sensor, and DHT22 sensor.

AWARDS

- **Dean's List of Honor** (1st position among approximately 150 students) *2022*
- **Top 5 Students' Scholarship** (Based on B.Sc Semester-wise results) *2019 - 2021*
- **Award for excellence in higher secondary education**
  Ministry of Education, Govt. of Bangladesh *2017 - 2020*

REFERENCE

H M Zabir Haque, Assistant Professor
Department of Computer Science and Engineering, Ahsanullah University of Science and Technology
Email: zabir.haque.cse@aust.edu