

Soumik Sarker

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Research Interests

- Security | Human-Centered Security | Data Privacy
- Privacy preserving AI/ML (Federated Learning) | Software Engineering for ensuring Security, Vulnerability Mitigation

Education

Shahjalal University of Science and Technology (SUST)

B.Sc in Computer Science and Engineering

CGPA - 3.60/4.0

Sylhet

2017 - 2021

Publications

A Survey on Blockchain & Cloud Integration

2020

- A thorough review of **blockchain-integrated services** in cloud platforms, specifically focusing on IaaS, PaaS, and SaaS models.
- A categorical representation of these integrations into four sections: **Security, Blockchain, Federation, and Management** -as a Service.
- Evaluation of each work using standardized metrics, feature comparisons, and constraint analysis.
- [IEEE Publication Link](#) | [Presentation Link](#)

Word Completion and Sequence Prediction in Bangla Language Using Trie and A Hybrid Approach of Sequential LSTM and N-gram

2020

- A hybrid linguistic model integrating **N-grams** and **bidirectional LSTM** for enhanced auto-completion and sequence generation.
- Architecture is designed to consider the unique characteristics of the **Bengali Language** while mitigating the limitations of existing architectures.
- Curation of a distinctive **dataset**, characterized by its rich vocabulary, drawn from **diverse literary sources** and Bangla news portals.
- Demonstration of superior performance, especially in scenarios requiring **preference-specific word completion** or **sentence suggestion**.
- [IEEE Publication Link](#) | [Presentation Link](#)

Deep Learning Approach Combining Lightweight CNN Architecture with Transfer Learning: An Automatic Approach for the Detection and Recognition of Bangladeshi Banknotes

2020

- A performance enhancement experiment using **lightweight CNN** models for automatic banknote detection and recognition.
- Experimented with different transfer learning and lightweight models like **MobileNet** and **NASNetMobile**.
- Combination of **data augmentation techniques**, **hyperparameter tuning**, and **optimization methods** for resolving limited dataset issues.
- Performance evaluation and demonstration of superior accuracy rates, outperforming the heavier **ResNet152v2** model.
- [IEEE Publication Link](#)

Work Experience

Therap (BD) Ltd.

Software Engineer II

Dhaka

Jul 2021 - Present

Therap is a US-based software company supporting health-specific managerial solutions for individuals, service providers, and states.

- Implemented several features for handling patients (primarily intellectual and developmental disabilities), service providers' data management, and service monetization for billing management, **scheduling**, **quartz**, and **XML**-based data
- Collaborated with **third-party aggregator** organizations to send our application data upon their requested approach.
- Involved in several **R&D projects** i.e. **Therap Report Lib.** (data export as pivot or spreadsheet, visualization tool), **Therap DOCx** (custom document processor), **Authentication Service**, Integration with IVR **PlumFuse**
- Took an active role in several significant releases of our system like **JDK**, **Spring**, **jQuery** and **Bootstrap** version upgrades.
- Handled several web security scopes i.e. **CSRF Security**, URL authentication with **HMAC Signature**, **Content Security Policy**
- Learned about security concerns and practices while developing external **JARs** or integrating with third-party libraries.
- Worked on data communication for several health **IoT** gadgets like **Withings Sleep Pad**, Smart blood pressure monitor.

BRAC HNPP APPLICATION DEVELOPMENT

Developer and Content Designer

Brac Center, Dhaka

Oct 2019 - Nov 2020

A contractual work with **Brac HNPP**, worth **4.3k USD**, for developing trainee (health workers in the training phase) management alongside a learning module.

- Developed a **learning and management tool** for health workers of the mentioned organization.
- Handled successful application maintenance (**comprising 25% of the current user base**) for a considerable time.
- Worked in a cross-functional environment and communicated with client requirements through several field visits.
- Currently on-live with more than **3k plus** users.

University research center funded our work on the implication of VR-based interactive module feasibility and acceptability for special children.

- Proposed an interactive **VR-based module** for people (especially children) with **Autism Spectrum Disease**.
- Navigated existing VR-related approaches and developed a prototype based on our proposition .
- Designed and developed interactive app integrated with **Augmented Reality** and **Virtual Reality**.
- **Supervisor:** [Md Mahadi Hasan Nahid](#) | [Project Paper](#)

Thesis & Notable Projects

Security-as-a-Service (SaaS): A Three-way Blockchain Based Security Service Delivery Model for Cloud

[Thesis Report](#)

I proposed a **three-way blockchain-enabled security service** (Access control, Secure Searchable Encryption, and Data provenance) on a cloud platform.

- Implemented blockchain-enabled **Secure Searchable Encryption (SSE)** on cloud platform.
- Data owners on cloud can have full secured control and shared policies over the files.
- Data owners can customize **access policies** through the use of **smart contracts**.
- By using **STRIDE threat modeling**, I verify the blockchain network for proper judgment and efficiency calculation.
- Study existing blockchain implementation on cloud in all sorts of scopes.
- **Platform:** Hyperledger Fabric, AWS Cloud
- **Supervisor:** [Dr. Md Sadek Ferdous](#) | [Thesis Presentation Link](#)

[Github Link](#)

SHIKHA (Torch - A light to freedom)

A story-based short-length role-playing game (RPG) based game.

- Players have to pass different obstacles and solve various sorts of riddles.
- I developed all the game environments, objects, and sprites myself.
- **Tools:** Unity, C#, Adobe Illustrator, Coral Essentials

[Github Link](#)

SUST ONLINE EXAM

A website to conduct exams and monitor student progress online.

- Manage new courses, course material, exams, exam questions and answers, and student performance from the teacher's side.
- Join an assigned exam from a particular teacher and get the result from the student's side.
- **Tools:** PHP, Laravel, MySQL

Skills

Languages	C, C++, C#, Java, Python, Php, JavaScript, Solidity
Frameworks and Tools	Hyperledger Fabric, Docker, Android Studio, Unity, Laravel, React, Firebase, Tensorflow, Oracle WebLogic
Database	MySQL, MongoDB, Oracle SQL
Version Control	Git
Operating Systems	Linux, Windows
Miscellaneous	Bash, LaTeX, Packet Tracer, MatLab, Adobe XD, Adobe Photoshop, Adobe Illustrator

Achievements & Roles

	WINNER (Team Nrick) BRACATHON 3.0
2019	Designed and developed a prototype of a digitalized learning approach for the health workers of BRAC in "Knowledge distribution in last-mile health services" category.
	WINNER (Team Nrick) SUST TechFest
2019	Presented a VR-based learning module for Autism of several age stages. Through this application, we focused on Joint Attention difficulty, a common issue for people with Autism.
	1st RUNNERS-UP (Team Nrick) IUT 10th ICT Fest
2018	Developed a prototypical app for patients seeking the right doctors, AI-based guidance , and emergency help .
	Secretary General SUST ACM Student Chapter
2019-2020	Organized several coding events , workshops , and especially virtual sessions during the COVID lockdown.
	Head of Design ICBSLP 2019
2019	Supervised publication team of the International Conference on Bangla Speech and Language Processing (ICBSLP).

Certifications

Coursera: [AWS Fundamentals Specialization](#), [Blockchain Specialization](#), [Google Cloud Platform Fundamentals: Core Infrastructure](#)