

Soumik Sarker

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Research Interests

- Security
- Data Privacy, Access Control
- Software Security
- Software Engineering Ensuring Security

Education

Shahjalal University of Science and Technology

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.
- 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 that integrates **N-grams** and **bidirectional LSTM** for enhanced auto-completion and sequence generation.
- Architecture is designed considering the unique characteristics of **Bengali Language** while mitigating the limitations of existing architectures.
- Curation of a distinctive **dataset**, characterized by its rich vocabulary, drawn from **diverse literary sources** in addition to Bangla news portals.
- Evaluation and 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

- An 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 banknote dataset issue.
- Performance evaluation and demonstration of superior accuracy rates, outperforming the heavier **ResNet152v2** model.
- [IEEE Publication Link](#)

Work Experience

Therap (BD) Ltd.

Dhaka

Software Engineer II

Jul 2021 - Present

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

- Implemented several features for handling patients and (primarily intellectual and developmental disabilities), service providers' data management, and service monetization for billing management, scheduling, quartz 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 major releases like **jQuery**, **Bootstrap** version upgradation.
- Handled sensitive data management while development, Web Security Scopes, Enterprise specific application development process.
- Learned about security concerns and practice while developing external **JARs** or integrating with third-party libraries.

BRAC HNPP APPLICATION DEVELOPMENT

Brac Center, Dhaka

Developer and Content Designer

Oct 2019 - Nov 2020

A contractual work with **Brac HNPP**, worth **4.3k USD**, for developing trainee (health workers on training phase) management alongside with 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.
- Negotiated business and design requirements with the business team and direct-user feedback.
- Communicated with client requirements through several field visits.
- Currently on-live with more than **3k plus** users.

Virtual Reality (VR) based E-learning application for children with ASD

SUST Research Center, SUST, Sylhet

Research Assistant and Developer

Jul 2019 - Jun 2020

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) having **Autism Spectrum Disease**.
- Navigated existing VR-related approaches and developed a prototype based on our proposition .
- Collected practical user feedback upon the prototypical demonstration and several Autism school visits.
- **Supervisor:** [Md Mahadi Hasan Nahid](#)

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](#)

SHIKHA (Torch - A light to freedom)

[Github Link](#)

A story-based short lengthed Role Playing Game (RPG) based game.

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

SUST ONLINE EXAM

[Github Link](#)

A website to conduct exams and monitor student progress online.

- Manage new course, course material, exam, exam questions-answers and also student performance from teacher's side.
- Join assigned exam from particular teacher and get the result from 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
Miscellaneous	LaTeX, Packet Tracer, MatLab, Adobe Phototshop, 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 in the time of COVID lockdown.
	Head of Design ICBSLP 2019
2019	Supervised publication team of International Conference on Bangla Speech and Language Processing (ICBSLP) 2019.

Certifications

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