

# Soumik Sarker

Dhaka, Bangladesh

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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.
- Worked in a cross-functional environment and 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 .
- Designed and developed interactive app integrated with **Augmented Reality** and **Virtual Reality**.
- **Supervisor:** [Md Mahadi Hasan Nahid](#) | [Short Research 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](#)

### 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

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

## Achievements & Roles

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