Urmi Biswas

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Education

BSc in Computer Science & Engineering *02/2020 - present*
Chittagong University of Engineering & Technology
– CGPA: 3.88/4.00 (till 7th semester)

Key Courses

Structured Programming, Object Oriented Programming, Algorithm, Data Structure, Database Management System, Machine Learning, IOT, Information Security, Software Engineering, Software Architecuture, High Performance Computing.

Technical Skills

Programming Languages: C, C++, Python
Web Development: HTML, CSS, JavaScript, MySQL
Frameworks: Django
Tools: Code Blocks, Google Colab, LaTeX

Research Interests

- **Cybersecurity** – network security, cryptographic protocols, threat detection and prevention, secure authentication systems, and blockchain-based security solutions
- **Algorithm Design** – efficient algorithms for optimization, graph theory, dynamic programming, and complexity analysis for real-world applications
- **Internet of Things (IoT)** – secure device communication, real-time data processing, edge computing, sensor network optimization, and IoT-cloud integration
- **Software Engineering** – agile development methodologies, system architecture and design patterns, software testing and quality assurance, DevOps practices, and scalable backend development

Blockchain Research & Development

Blockchain-based Certificate Verification System — *Academic Thesis, Ongoing* Designed a blockchain-based certificate verification system incorporating secure student onboarding, encrypted certificate issuance using IPFS and private-key encryption, and a robust revocation mechanism to ensure data integrity. Integrated Bloom and Cuckoo filters to optimize storage and accelerate lookup operations during the verification process. Developed a verification workflow enabling stakeholders to authenticate credentials by validating cryptographically signed IPFS hashes stored on the blockchain. Conducted comprehensive security and performance analyses to evaluate the system's resilience against attacks and its efficiency in real-world scenarios. This solution enhances trust, transparency, and security in academic credential validation, significantly reduces the risk of forgery, and streamlines verification processes across educational ecosystems.

Projects

Django ToDoApp — Django — HTML — CSS — GitHub
Developed a Todo Application using Django, implementing CRUD (Create, Read, Update, Delete) operations with user authentication. Ensured that each user can only access and manage their own tasks by implementing secure authentication and authorization mechanisms. Designed a clean and responsive user interface for task management.

Student Management System — Django — SQLite3 — GitHub
Built a web-based application to manage student records using Django. Implemented full CRUD operations with Class-Based Views (CBVs) and Django Forms for robust validation and user input handling. Utilized SQLite3 for lightweight local data storage. The system features a clean, user-friendly interface and demonstrates modular, maintainable code structure.

Job for Students — PHP — HTML — CSS — MySql — GitHub
Developed a job portal where teachers can post job opportunities and students can apply for them. The system features user registration, login, profile management, job posting, and application functionalities. Implemented role-based access control to ensure teachers and students interact with the system securely and appropriately. Built with a responsive interface for a seamless user experience.

Work Experience

Software Engineering Intern *12/2024 - 01/2025*
W3 Eden, Inc.

Blockchain Competitions

TraceSure — *Finalist, UIU Inter-University Blockchain Olympiad 2025* Proposed TraceSure, a blockchain and IoT-powered solution to ensure product authenticity and full lifecycle transparency in supply chains. Each product is embedded with IoT sensors and QR codes to capture real-time data (e.g., manufacturing details, repairs, replacements), which is recorded on a public blockchain. The system architecture includes IoT integration, backend validation, smart contract–based certification, and real-time access for manufacturers, dealers, regulators, and consumers. This ensures seamless product verification, fraud prevention, and trust at every stage—from production to consumer purchase. **Whitepaper:** TraceSure.pdf

HarvestHope Network — *Finalist, Blockchain Olympiad Bangladesh 2024* Proposed HarvestHope Network, a blockchain-based solution to create a fair, transparent, and efficient agricultural supply chain in Bangladesh. Using the Ethereum public blockchain and smart contracts, the system enables transparent bidding, automated pricing, and immutable quality certification. It connects farmers, wholesalers, retailers, and consumers through a decentralized marketplace where all transactions, inspections, and stock movements are verifiable in real time. The solution prevents price manipulation, ensures fair farmer compensation, and boosts consumer trust through direct, traceable transactions. **Whitepaper:** HarvestHope Network.pdf

Competitive Programming

Solved 4000+ problems. Regularly participates in online contests.

- **Codeforces:** 3000+ problems, Max Rating: 1661 (Expert) — Profile
- **CodeChef:** 200+ problems, Max Rating: 2001 (5*) — Profile
- **Atcoder:** 100+ problems, Max Rating: 991 (6 Kyu) — Profile
- **LeetCode:** 650+ problems, Top 1.17%, Max Rating: 2173 — Profile

Team Achievements

- **26th Position, MIAKI Presents KUET IUPC Onsite 2025:** *Standings*
- **79th Position, ICPC Asia Dhaka Regional Contest 2024:** *Standings*
- **6th Position, CUSS IT Fiesta 2024 Inter University Programming Contest:** *Standings*
- **45th Position, Inter University Programming Contest — United Group Presents BUET CSE Fest 2024:** *Standings*
- **71th Position, NCPC Onsite 2023:** *Standings*
- **58th Position, Kinetik Presents Cuet Inter Programming Contest Codestorm 1.0:** *Standings*
- **26th Position, Algo Queen 2024:** *Standings*
- **11th Position, Algo Queen 2023:** *Standings*
- **21th Position, Ada Lovelace NGPC 2022:** *Standings*
- **15th Position, National Girls Programming Contest 2021:** *Standings*

Hobby

Reading Programming books, Chess