

Ishrak Ahmed

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Education

2022 – 2026	United International University , Dhaka <i>B.Sc. in Computer Science and Engineering</i> (Final Trimester)
2018 – 2020	Government Science College , Dhaka <i>H.S.C in Science, GPA: 5.00</i>
2013 – 2018	Motijheel Model High School , Dhaka <i>S.S.C in Science, GPA: 5.00</i>

Skills

Languages	C, C++, C#, Java, Python, JavaScript, TypeScript, PHP, HTML, CSS
Frameworks	Node.js, React, Laravel
Databases	MySQL, SQLite
Tools	Git, Figma

Projects

- **AEGIS – Advanced Endpoint Guard & Intelligence System** *(Final Year Design Project – Champion, CSE Project Show 2025) Python, React, JavaScript*
 - Built an end-to-end Windows cybersecurity suite featuring a HIDS (RandomForest on 100 API-call features + Memory HIDS on CIC-MalMem-2022), a real-time NIDS (MLP with sub-millisecond inference via Scapy), and an auto-blocking IPS – all with XAI explanations via SHAP and LIME.
 - Developed an NLP Threat Detector covering 10 categories (phishing, credential theft, PII exposure, etc.) in English and Bangla, with Real-Time Protection that runs Tesseract OCR on periodic screenshots and pushes Windows alerts on detection.
 - Integrated the SIFT Engine – an LLM-powered code auditor that catches typosquatting (Slopsquatting) on PyPI/npm, unsafe regex patterns, and known vulnerabilities with fix-verification scoring.
 - The system evolved from Sentinel, an earlier web-based security monitoring prototype that established the core alert visualisation and event-tracking architecture later adopted in AEGIS.
- **Echo – AI Screen Assistant** *TypeScript, React*
 - Developed a desktop AI assistant that captures the user's screen and answers questions about visible content using vision AI.
 - Implemented bilingual support (English and Bengali) with voice input/output via the Web Speech API.
- **Flux – AI Project Mentor** *Python, JavaScript, MySQL*
 - Developed an AI-powered project mentoring platform that guides users from a raw idea to a fully scaffolded codebase.
 - Implemented agentic RAG with live web search via DuckDuckGo to ground project ideas in current market data.
 - Created a one-click code scaffold generator producing downloadable project skeletons based on selected blueprints.
- **Pronto – AI Marketing Automation Platform** *Node.js, MySQL*
 - Built an AI-powered marketing platform for small businesses that crawls websites to extract brand identity (colors, fonts, tone).
 - Implemented AI-driven campaign idea generation with tailored marketing concepts based on business DNA analysis.
 - Developed a multi-provider image generation system with smart fallback strategy (Freepik, Hugging Face, Polinations).
- **BiniOrbit – Business Social Networking Platform** *PHP, JavaScript, CSS, MySQL*
 - Built a social networking platform connecting business owners and investors with user profiles, newsfeed, and connection management.
 - Implemented real-time messenger, post interactions (likes, comments, sharing), and notification system.
 - Developed an admin dashboard with user management, content moderation, reporting, and downloadable statistics (PDF export).
 - Created investment management features allowing investors to browse businesses and submit investment requests.

Research

- **SIFT: A Hybrid AI-Static Analysis Framework for Security-Informed Functional Testing of Source Code** *Ongoing*
Ishrak Ahmed, Tanisha Zaman, Zelqad Hassan Shish, Mohammad Mamun Elahi, Muhammad Nomani Kabir – United International University
 - Proposes a five-phase hybrid pipeline combining deterministic static analysis (registry verification, ReDoS scanning, regex analysis) with LLM-driven semantic reasoning to detect slopsquatting, hallucinated dependencies, and logic vulnerabilities in source code.
 - Achieves $F1 = 0.547$ on the OpenSSF CVE Benchmark (223 JavaScript CVEs) and $F1 = 0.848$ on AICGSecEval (129 instances across 7 languages) via vulnerability-centred truncation and focused diff injection, exceeding CodeQL’s Green rate and outperforming the ossf-sast-ml neural baseline by $3.8\times$.
- **RT-XNIDS: A Real-Time Flow-Based Network Intrusion Detection System Using Deep Learning and XAI** *Ongoing*
Ishrak Ahmed, Abu Sayed Rabbi, Atique Bin Mahmud – United International University
 - Proposes a real-time NIDS that performs in-memory five-tuple flow construction, extracts 6 features with $O(1)$ complexity per packet, and runs a lightweight MLP ($6 \rightarrow 64 \rightarrow 32 \rightarrow 2$) achieving 85.5% accuracy and 0.17 ms per-flow latency on CIC-IDS2017 – a $260\times$ speedup over high-dimensional offline baselines.
 - Integrates SHAP and LIME per-flow forensic explanations displayed on a live Streamlit dashboard, supporting SOC analyst transparency and regulatory compliance (GDPR Art. 22, NIS2, ISO/IEC 27001).
- **Sustainable Software Engineering for Energy-Efficient AI: A Study of Green Coding Practices and Developer Tools in ML** *Ongoing*
Ishrak Ahmed, Md. Abu Hasnat, Atique Bin Mahmud, Ilham Mahfuz Riyadh, Md. Siamul Islam – United International University
 - Conducted a PRISMA 2020 systematic review across 6 databases (312 records, 18 selected) covering Green AI tools and developer-facing energy-reduction techniques spanning 2020–2026.
 - Demonstrated via a hands-on MNIST experiment that applying a smaller CNN architecture with early stopping reduces energy consumption by 55.33% and training time by 45.74% with only a 0.42 pp accuracy drop.

Awards & Activities

- **Champion**, Final Year Design Project – I, Summer 2025 Trimester, CSE Project Show, United International University
- **UIU Photography Club** – Head of Design *2023 – 2026*

References

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