Arun Bharti

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Education

Indian Institute of Information Technology, Allahabad **2024 – 2026**
M.Tech in Information Technology *CGPA : 8/10*

Projects

SecureDocs: Secure Document Sharing Platform
Tech Stack: C++, JavaScript, Node.js, MongoDB, React, WebAssembly, IBE, AES, BLS Signature

- Built a secure document-sharing system where users upload, share, and access fully encrypted documents.
- Implemented decentralized KDC and Identity-Based Encryption (IBE) for robust, simplified key management.
- Offloaded AES encryption to C++ WebAssembly and used BLS signatures for low-latency, authenticated file transfers.

Streamify: Real-Time Video Call & Chat App
Tech Stack: React.js, Node.js, Express, MongoDB, Socket.IO, WebRTC, Tailwind CSS

- Developed a real-time video calling and chat platform using WebRTC for media and Socket.IO for signaling and messaging.
- Added JWT-based auth, friend management, presence, screen sharing, and theme switching for a complete user experience.
- Optimized backend and MongoDB design to support 20+ concurrent users and 50+ active peers during IIITA deployment.

Secure Password Manager: Browser Extension
Tech Stack: JavaScript, Chrome Extension (MV3), IndexedDB, Web Crypto API

- Built a local-only browser password manager where all credentials are encrypted client-side and stored in IndexedDB, with no data sent to any server.
- Implemented PBKDF2-HMAC-SHA-256 (250k iterations) and AES-256-GCM using the Web Crypto API, keeping the derived master key only in background memory while unlocked.
- Added auto-lock via Chrome alarms, configurable strong password generator, active-tab URL autofill, and a responsive popup UI for managing credentials.

M.Tech Thesis

Security in Software Supply Chain using The Update Framework (TUF)

Tech Stack: Python, The Update Framework, Cryptographic Key Management, Role-Based Access Control

- Analyzing modern software supply chain attacks such as dependency confusion, repo hijacking, and compromised mirrors.
- Enhancing TUF with multi-role delegations, repository prioritization, and key pinning for secure multi-repository ecosystems.
- Proposed a threshold trust model where critical metadata is signed by multiple keys to reduce single points of failure.
- Built a proof-of-concept TUF client achieving <10 ms metadata verification overhead, even with multiple repositories.
- Evaluating trade-offs between stronger security guarantees and update performance using Python-based simulations.

Technical Skills

- **Languages:** C++, Python, C, JavaScript, SQL
- **Frameworks & Tools:** React, Node.js, Express, REST APIs, WebRTC, Socket.IO, Git, Linux
- **Databases:** MongoDB
- **Security & Testing:** Wireshark, Snort, CodeceptJS, SSL/TLS, https, AES, PBKDF2, BLS signatures

Achievements

- **LeetCode rating: 1702**; achieved a best contest rank of **1,160 / 27,973** (top **4%**) among global participants.
- Solved over **400+ problems** across GeeksforGeeks, Coding Ninjas & LeetCode, strengthening data structures and algorithms.
- Earned the **365 Days of Code Badge** on LeetCode for consistent problem-solving practice.
- Qualified **GATE** in **CSE** (2023, 2024) and **DSAI** (2024), reflecting strong foundations in computer science and data science.
- Earned coding certifications from **HackerRank** and **Coding Ninjas**, highlighting strong programming and analytical skills.