Arun Bharti

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Education

Indian Institute of Information Technology, Allahabad **2024 – Present**
M.Tech in Information Technology *Prayagraj, India*

Technical Skills

- **Languages:** C++, Python, JavaScript
- **Frameworks:** Node.js, Express.js, React.js
- **Databases:** MongoDB, MySQL
- **Security:** JWT, TLS, AES, Wireshark
- **Core CS:** DSA, OOP, OS, DBMS, CN
- **Tools:** Git, Linux

Projects

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

- Built a secure document-sharing system with **end-to-end encryption**, supporting **100+ encrypted uploads** and role-based access control.
- Designed a **decoupled Key Distribution Center (KDC)** using **Identity-Based Encryption (IBE)**, eliminating single points of failure and reducing key-management overhead by ∼**40%**.
- Optimized cryptographic performance using **AES in C++ WebAssembly** and **BLS signatures**, achieving **sub-50 ms latency** and ∼**40% lower signing overhead** than RSA.

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

- Developed a **real-time video calling and chat application** using **WebRTC** for peer-to-peer media streaming and **Socket.IO** for signaling and messaging.
- Implemented **JWT-based authentication**, friend management, user presence, screen sharing, and UI theming for a full-featured real-time communication platform.
- Optimized backend APIs and **MongoDB data models** to reliably support **20+ concurrent users** and **50+ active peers** during live deployment at IIITA.

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

- Built a **local-only browser password manager** with all credentials encrypted client-side and stored in **IndexedDB** — zero data sent to any server.
- Implemented **PBKDF2-HMAC-SHA-256** (250k iterations) and **AES-256-GCM** using the Web Crypto API, keeping the 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 credential management.

M.Tech Thesis — Secure Software Supply Chain Using The Update Framework (TUF) GitHub
Tech Stack: Python, The Update Framework (TUF), Threshold Cryptography, Multi-Repo Verification

- Designed and implemented a **secure software update verification framework** based on **TUF** to defend against **replay, freeze, and supply-chain attacks**.
- Developed **threshold trust**, **delegated roles**, and **key pinning** mechanisms to improve fault tolerance and cryptographic resilience.
- Built a **Python-based multi-repository verification client** with metadata validation latency under **10 ms**.

Achievements

- Achieved a **LeetCode rating of 1702**, with a best global contest rank of **1,160 out of 27,973 participants** (top **4%**).
- Solved **1000+ algorithmic problems** across **LeetCode**, **TakeYouForward**, and **Coding Ninjas**, strengthening data structures and algorithms proficiency.
- Earned the **365 Days of Code Badge** on LeetCode for consistent daily problem-solving practice.
- Qualified **GATE** in **Computer Science and Engineering** (2023, 2024) and **Data Science and Artificial Intelligence** (2024).
- Completed **programming and problem-solving certifications** from **HackerRank** and **Coding Ninjas**.