Arun Bharti

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Education

Indian Institute of Information Technology, Allahabad　　*Aug 2024 – Present*
M.Tech in Information Technology with specialization in Network and Security

Madan Mohan Malaviya University of Technology, Gorakhpur　　*Oct 2020 – May 2024*
B.Tech in Computer Science and Engineering

Major Coursework: Data Structures and Algorithms, Object-Oriented Programming, Cryptography, Database Management System, Operating Systems.

Experience

Teaching Assistant　　*Aug 2024 – Present*
Indian Institute of Information Technology, Allahabad

- Conducted programming 30+ lab sessions for Cyber Security, helping 250+students gain hands-on experience in secure coding and applied concepts.
- Organized and conducted coding 10+ contests on Arrays, Strings, and Pointers using HackerRank, improving 60+ students' algorithmic and problem-solving skills.

Skills

- **Programming:** C++, C, Python, JavaScript, SQL.
- **Web & Frameworks:** React, Node.js, Express, REST APIs, WebRTC, Socket.IO.
- **Databases:** MongoDB.
- **DevOps & Tools:** Git, GitHub, Linux.
- **Security & Testing:** Wireshark, Snort, CodeceptJS.

Projects

SecureDocs – Secure Document Sharing Platform [Live]　　*Feb 2025 – May 2025*
| *C++, Java Script, Node.js, MongoDB, React, WebAssembly, PBC Library, IBE, AES, BLS Signature*

- Engineered a Key Distribution Center (KDC) separated from the Data Server, enhancing redundancy and eliminating single points of failure to improve system fault tolerance.
- Integrated Boneh-Lynn-Shacham (BLS) signatures, ensuring sender authenticity with 40% lower computational overhead compared to RSA.
- Benchmarked AES encryption in WebAssembly, achieving sub-50 ms latency across 100+ encrypted file transfers.
- Applied cryptographic protocols (AES, JWT, SHA-256) and cybersecurity principles in identity-based encryption and secure key management.

Streamify [Live]　　*Jan 2025 – Feb 2025*
| *React.js, Node.js, Express, MongoDB, Socket.IO, WebRTC, Tailwind CSS, TanStack Query*

- Developed a full-stack web application for real-time communication, integrating WebRTC and Socket.IO for low-latency video calls and instant messaging.
- Implemented secure user workflows with JWT-based authentication, onboarding flow, friend management, messaging, screen sharing, and customizable theme switching.
- Achieved adoption among peers, with *20+ concurrent users* during peak sessions and a base of *50+ regular active users* at IIITA.

Research

M.Tech Thesis – Security in Software Supply Chain using The Update Framework　　*Jan 2025 – Present*
| *The Update Framework, Cryptographic Key Management, Role-Based Access Control, Secure Software Supply Chain*

- Enhanced The Update Framework (TUF) with multi-role delegations, repository prioritization, and key pinning to strengthen trust in multi-repository ecosystems.
- Designed and implemented threshold trust models with cryptographic key management, reducing single points of failure in software update pipelines.
- Built a proof-of-concept system achieving < 10 ms metadata verification overhead, improving resilience against dependency confusion and supply chain attacks highlighted by CNCF and OWASP.