

Amar Kumar Mandal

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Professional Summary

Backend developer with hands-on experience building secure and scalable backend applications using **Python** and **JavaScript** technologies. Experience in applying cryptographic techniques such as RSA, Diffie–Hellman, and AES in secure communication and application design. Research interests include **Homomorphic encryption**, **post-quantum cryptography**, and **differential privacy** for next-generation secure applications.

Education

Master’s in Applied Cybersecurity (CyberMACS) – Erasmus Mundus Scholar Sep 2025 – Present
Kadir Has University, Istanbul, Türkiye

Fully funded Erasmus Mundus Joint Master Degree Scholarship

Relevant Coursework: Computer Network and Security (network protocols, subnetting, routing, forwarding, TCP/IP layers), Cryptography (encryption, decryption, RSA, Diffie-Hellman, digital signatures, hashing), Machine Learning for Time Series (autocorrelation, stationarity, segmentation, LSTM, change-point detection), Research Methodology (qualitative & quantitative research, hypothesis testing, p-values, descriptive statistics)

Bachelor of Engineering in Computer Engineering Aug 2018 – May 2023
Kathmandu University, Dhulikhel, Nepal

Relevant Coursework: Data Structures and Algorithms, Algorithm Complexity, Database Management Systems, Machine Learning, Artificial Intelligence, Blockchain Technology, Object-Oriented Programming, Principles of Programming Languages, Calculus and Linear Algebra, Numerical Methods, Operations Research

Publications

Zivko Atanaskoski, **Amar Kumar Mandal**, S M Dedar Alam, Bimbo Lawrence Damitan, Bisola Favour Adediji, Zorica Karapancheva, Mila Dodevska, Vesna Dimitrova.

“An Empirical Study of the Privacy-Utility Trade-off in Differentially Private Classifiers.”

23rd International Conference on Informatics and Information Technologies (CIIT), 2026. (Accepted)

Research in Progress

Aditya Mitra, **Amar Kumar Mandal**, Iqra Naz, Amaan Rais Shah.

“SSHafe: A Real-Time SSH Brute Force Attack Detection and Novel Credential Rotation Standard.”

Manuscript in preparation, CyberMACS Programme, Kadir Has University.

Professional Experience

Senior Backend Developer

Veda Studios Pvt. Ltd. — 24/07/2023 – 11/08/2025

- Implemented core features including end-to-end encryption, multi-factor authentication (MFA), secure media handling, multi-device synchronization, and CDN integration.
- Designed microservice architecture and defined service boundaries based on data coherence and coupling analysis. Set up centralized monitoring using Prometheus and Grafana dashboards to visualize system metrics and detect early-stage failures.
- Built CI/CD pipelines and automated deployment of distributed services on Microsoft Azure. Deployed and stabilized a Kafka cluster on AWS to enable reliable asynchronous communication between microservices.

Technical Skills

Programming Languages: JavaScript, Typescript, Python, Rust, Go, C

Backend Technologies: Node.js, Express, Deno, NestJS

Databases: PostgreSQL, MongoDB, MySQL, VectorDB

Security: RSA, Symmetric Encryption, Signal Protocol (conceptual), End-to-End Encryption, Firewall, VPN(IPsec), Layer 2 Security, and DHCP snooping

Networking: Switching, Routing Protocols, Wireless Essentials, IP services, Access Control, IPV6, Software Defined Networking, Virtualization

Tools: Git, Linux, Docker, Kubernetes, Docker Compose, AWS, Azure, GCP, Cisco Packet Tracer

Projects

Flashcard Application for Code Snippets

- Built a developer-focused flashcard desktop application using **Tauri** and **React** to store and review code snippets with preserved indentation and formatting.
- Addressed limitations in traditional tools like Anki by enabling seamless copy & paste of code snippets without manual formatting adjustments.
- Integrated the **SuperMemo-2 spaced repetition algorithm** to improve long-term retention of programming concepts through optimized review scheduling.

Grayscale Image Colorizer

- Designed a convolutional autoencoder to predict the color channel (a, b) from the grayscale input using an encoder-decoder architecture.
- Leverage LAB color space to separate the L-channel (brightness) from the color channels (a, b) to simplify the model learning process.
- Implement the Data augmentation pipeline using image properties such as rotation, zoom, shear, and horizontal flip to improve model generalization.
- Integrate the model with the React application using the Flask API allowing the user to upload grayscale image and view colorized image as an output.

Research Interests

Cloud Security, Post-Quantum Cryptography, Privacy Preserving Machine learning, Lattice based Cryptography, Homomorphic Encryption, Differential Privacy

Certifications & Professional Badges

- **Cisco Certified Network Associate (CCNA)** – Cisco May 2026
Verify on Credly
- **Advanced Learning Algorithms** – Coursera Nov 2024
Verify on Coursera
- **Supervised Machine Learning: Regression and Classification** – Coursera Aug 2024
Verify on Coursera