

RAGHU KUMAR

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LinkedIn | GitHub | Portfolio | **LeetCode: 1646 (Top 15%)**

Full-stack Software Engineer with production experience building scalable MERN applications and contributing to GenAI/RAG systems. Delivered enterprise features at Alpine Privacy, architected ASR benchmarking platform for government-backed Bhashini initiative, and built/deployed live web applications. Strong problem-solver with LeetCode rating of 1646 (Top 15%, 500+ problems) and hands-on expertise in cloud deployments, CI/CD automation, and production-grade development.

TECHNICAL ACHIEVEMENTS

- **Competitive Programming:** LeetCode rating **1646 (Top 15% globally)**, solved **500+ algorithmic problems** across all major topics (Arrays, Trees, Graphs, Dynamic Programming)
- **Production Deployment:** Built and deployed **CampusPYQ**, a full-stack academic platform with automated CI/CD, serving students with 200+ uploaded documents
- **Government Research:** Active contributor to **Bhashini** (Govt. of India) for developing production-grade ASR systems for Indian languages

TECHNICAL SKILLS

- **Languages:** C++, JavaScript (ES6+), Python, Java, SQL, HTML5/CSS3, TypeScript
- **Frameworks & Libraries:** React.js, Node.js, Next.js, Express.js, PyTorch, Hugging Face Transformers, TensorFlow
- **Databases & Caching:** MongoDB, PostgreSQL, MySQL, Redis, Firebase Realtime Database
- **Cloud & DevOps:** AWS (EC2, S3, Lambda), Docker, Kubernetes, GitHub Actions (CI/CD), Linux, Nginx
- **Core Competencies:** Data Structures & Algorithms, System Design, RESTful APIs, Microservices, RAG Architecture, GenAI, WebSockets

PROFESSIONAL EXPERIENCE

Software Development Engineer (SDE) Intern

Alpine Privacy

Jun 2025 – Aug 2025

- Extended open-source **LibreChat** framework for enterprise GenAI applications, implementing full-stack features (React + Node.js) for production chat system serving enterprise clients
- Built **Retrieval-Augmented Generation (RAG)** pipeline for internal document querying using vector embeddings and semantic search, enabling efficient information retrieval across organizational knowledge base
- Optimized **MongoDB query performance by 40%** through strategic indexing and query restructuring, improving chat history retrieval for real-time messaging at scale
- Implemented backend API endpoints and frontend components for chat management, user authentication, and document upload workflows

AI Research Contributor (ASR)

Bhashini Initiative (Govt. of India)

IIIT Delhi | Prof. Shad Akhtar

May 2025 – Present

- Contributing to **Government of India's Bhashini project**, developing production-grade Automatic Speech Recognition (ASR) systems for 10+ Indian languages under Prof. Shad Akhtar
- Architected and deployed **ASR Leaderboard web platform** (React + Node.js + MongoDB) for benchmarking speech recognition models across multiple datasets, enabling researchers to compare model performance with real-time metrics visualization
- Built scalable **inference pipelines** for ASR models (Whisper, mBART) with distributed processing capabilities, implementing batch inference and evaluation workflows for low-resource Indian language transcription
- Designed end-to-end ASR workflows including data preprocessing, model inference, accuracy evaluation, and results aggregation across multiple language datasets

Freelance Full-Stack Developer

Self-Employed

Various Clients

2023 – Present

- **ISKCON Noida – Donation Platform:** Enhanced donation management system by implementing payment gateway integration improvements, form validation logic, and backend API optimizations that increased successful transaction completion
- **IIIT-D Faculty Portal:** Independently developed React/Node.js internal management tool for faculty to handle grants, leave requests, and administrative workflows, streamlining processes through automated form handling and database management

KEY PROJECTS

CampusPYQ: Academic Resource Sharing Platform

Live

- Built production-grade **MERN stack platform** for academic resource sharing, serving students with **200+ uploaded documents** and facilitating peer-to-peer educational content exchange
- Implemented automated **CI/CD pipelines using GitHub Actions** with Docker containerization, achieving **consistent deployments and 99%+ uptime** on AWS EC2 infrastructure
- Integrated **OAuth 2.0 authentication** (Google Sign-In), optimized media uploads via **Cloudinary CDN** (reducing load times), and implemented secure file storage with access control
- Architected scalable backend with Express.js APIs, MongoDB for data persistence, and Nginx as reverse proxy for load distribution and SSL termination
- *Tech Stack: React.js, Node.js/Express, MongoDB, Docker, AWS EC2/S3, Nginx, Cloudinary CDN, GitHub Actions*

URL Shortener with Analytics

GitHub

- Developed scalable URL shortening service using **Node.js + MongoDB**, implementing custom short code generation using Base62 encoding and collision detection
- Built click tracking and analytics system with **Redis caching** for real-time metrics, tracking geographic data, referrer sources, and user agents
- Implemented **rate limiting** (100 requests/minute per IP), expiration policies for URLs, and RESTful API with comprehensive error handling
- *Tech Stack: Node.js, MongoDB, Redis, Express.js, Docker*

EDUCATION

Indraprastha Institute of Information Technology, Delhi (IIIT-D)

2022 – 2026

B.Tech in Computer Science and Biosciences (CSB)

- **Relevant Coursework:** Data Structures & Algorithms, Operating Systems, Database Management Systems, Computer Networks, Machine Learning, Object-Oriented Programming
- **Technical Projects:** Built multiple full-stack web applications, implemented ML models for classification tasks, developed concurrent systems in C++