KARAN GUPTA

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EDUCATION

SRM INSTITUTE OF SCIENCE OF SCIENCE AND TECHNOLOGY Chennai, TN, Chennai
Bachelor of Engineering, Computer Science Engineering 2022-26
Structured Programming Approach(C,C++),Data Structures and Algorithms, CI/CD Operations, Data Analysis(Python), Database Management, Data Modeling, Predictive Analysis and Visualization, Virtualization, GPU Computing

TECHNICAL SKILLS

- **Programming Languages** - Python for Data Science & Analytics (Pandas, NumPy, Scikit-learn, TensorFlow, Keras, PyTorch, SpaCy, NLTK, OpenCV), R programming
- **Web Development** - HTML, CSS, JavaScript, JQuery, React, Angular, Node.js, Vanilla.js, Express.js, Web sockets, GenAI, API Routing, Django, Flask AP, REST APIs, Auth0, Clerk, WebSockets
- **CI/CD**: Jenkins, GitHub Actions, GitLab CI/CD, Docker, Kubernetes, Terraform, AWS DevOps, Google Cloud Platform (GCP), Heroku
- **Database Management** - MySQL, SQL Stored Procedures, MongoDB, PostgreSQL, JSON, XML
- **Analytical & Statistical techniques** – Feature Engineering, Pattern recognition, Logistic & Linear Regression, Natural Language Processing, Decision Trees, Random Forest, Classification, Clustering, Hypothesis testing, A/B Testing, Selenium
- **Business Skills** - Project Management, Business Process Analysis, Logistic Information Systems
- **Software** – AWS, Jupyter Notebook, Google Collab, Google Analytics, Nutanix, SQL Server, MATLAB, R Studio, Excel, PowerPoint, VMBox, VSCode

ACADEMIC PROJECT EXPERIENCE

GPU acceleration

Engineered a CUDA Graphs–driven overhaul of iterative GPU workloads to eliminate kernel-launch overhead and unlock double-digit throughput gains on production-grade hardware.
Achieved elite concurrency via multi-stream scheduling and event synchronization, validated on Tesla T4 with Precise CUDA event profiling for latency compression and sustained throughput.

- Delivered 11× speedup for Conjugate Gradient (CG) and ~10× for PSO using static CUDA task graphs under iterative compute.
- Removed launch overhead with unified memory and stream capture APIs, including cudaStreamBeginCapture and cudaGraphLaunch, for repeatable high-throughput execution.
- Proved scalability with custom timing harnesses and CUDA events to quantify concurrency gains across kernels and memory paths.
- Stack: C++, CUDA, cuBLAS, cuSPARSE, OpenACC, Tesla T4.

Web SSH terminal

Built a real-time, browser-native SSH control plane that securely operates remote machines without desktop clients, delivering low-latency command streaming and resilient session control.
Hardened authentication and execution flows with middleware-driven routing, public key integration, and structured error handling for developer-grade reliability at scale.

- Terminal UX powered by Node.js, Express, WebSockets, and xterm for bidirectional streaming and responsive I/O.
- Public key authentication with .pem ingestion and dynamic target IP input for secure, flexible access across environments.
- Session-safe execution pipelines enforce clean separation of routing, session control, and command execution.
- Stack: Node.js, Express, WebSockets, SSH (public key), xterm.

Hierarchical sentiment AI

Authored a four-tier BERT fine-tuning pipeline over 71K+ tweets to dominate classification depth from topic discrimination to nuanced affective states under real-world distributions.
Stabilized multi-stage performance with stratified sampling and F1-optimized training, preserving precision and recall across highly imbalanced labels.

- Level 1: COVID-19 vs. Non-COVID-19 at 99.98% accuracy; Level 2: emotion detection at 96.7%; Level 3: fine-grained emotions at 90.4%; Level 4: depression detection at 95.5%.
- Targeted BERT tuning per subtask with metric-anchored optimization to maintain robustness across hierarchical outputs.

- Stack: Python, NLP, LLM, PyTorch, BERT; dataset scale: 71K+ tweets.

WORK EXPERIENCE

Solar Secure Solutions Chennai,TN,India

Full Stack Developer July 2022 – Sep 2022

- Worked on client projects utilizing the latest web technologies, contributing to feature development and enhancing functionality across various platforms.
- Collaborated with cross-functional teams, focusing on writing and optimizing specific chunks of code to meet project requirements and improve performance.
- Gained hands-on experience in Node.js and React, contributing to the backend and frontend development, respectively.
- Played a key role in delivering high-quality solutions, ensuring efficient collaboration and continuous integration within the team.

Freelancer Remote

Full Stack Developer Nov-2025 - Present

- Improved Dockerized Postgres database health checks, ensuring Postgres does not report as "unhealthy" prematurely during startup.
- Reduced start_period for rapid readiness, and increased health check retries to optimize for both fast and slow machines—minimizing unnecessary wait while maintaining robust health detection.
- Delivered a minimal yet impactful fix, contributing to more reliable local development and CI pipelines for the backend stack.