Tanu Shree Gupta

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EDUCATION

GGSIP University, Delhi — **CGPA: 8.3 / 10**
B.Tech Electronics & Communication Engineering (IIOT) — 2027

Kendriya Vidyalaya Chittorgarh — **Percentage: 90.4%**
XII (CBSE) — 2022

Kendriya Vidyalaya Chittorgarh — **Percentage: 90.8%**
X (CBSE) — 2020

WORK EXPERIENCE

ReferralMe — **Intern**
AI Automation — June 2026 - Aug 2026
• Conducted meetings with 10+ referral-providing clients to understand hiring workflows and requirements, translating operational bottlenecks into an automated referral pipeline.
• Automated referral generation for 50+ user profiles by extracting and processing ATS metadata to match candidates with relevant referral opportunities, reducing manual processing time by 88%.

Department of Mathematics, IIT Delhi — **Intern**
Behavioral Finance & Investments — Jul 2025 - Dec 2025
• Developed a prospect theory-based portfolio optimization framework and validated it on **20 years of historical data across 5 major global indices** (S&P 500, FTSE 100, Nikkei 225, etc.), **outperforming the benchmark S&P 500 index by 8%** in backtesting simulations.
• Created a lexicon-based sentiment scorer by analyzing **over 50,000 news headlines**, improving the stock performance prediction model's accuracy by **5%** and enhancing the robustness of the overall investment strategy.

IBM — **Intern**
AI Agent Architecture — Jul 2025 – Aug 2025
• Completed a **4-week** hands-on capstone on AI agent architecture, culminating in the deployment of a multi-agent system.
• Designed a scalable **5-agent system** that automated a complex data analysis task, **reducing processing time by 40%**.
• **Built 3 distinct agent workflows** for automated decision-making, which **decreased manual intervention by over 90%.**

RESEARCH & PUBLICATIONS

Book Chapter (Accepted - in Press) | Springer Nature
• **Title:** Gupta, T. S. (2026). Architecting Resilient Human-in-the-Loop Healthcare Systems: Navigating the Paradox of Adaptive AI and Deterministic Governance. In Resilient Smart Healthcare: Architectural Principles, Economic Models, and Regulatory Frameworks. Springer Nature.
• **Core Contribution:** Proposed the Layered Shared-Autonomy Platform (LSAP) — a novel four-layer clinical AI governance architecture that resolves the structural conflict between continuous machine learning adaptation and deterministic regulatory compliance (EU AI Act, EU-GMP Annex 22, FDA PCCP), incorporating regulatory sandbox digital twins operating in shadow mode for safe, continuous model validation.
• **Research Areas Demonstrated:** HITL AI systems · Clinical decision support governance · Explainable AI (XAI) · Adaptive AI regulation · Healthcare metaverse · Industry 5.0 · Digital twin architecture · EU AI Act compliance · FDA SaMD frameworks

Research Paper – IIoT Predictive Maintenance — **Under Review**
• Developed a decoupled two-stage Deep Reinforcement Learning framework for prescriptive predictive maintenance of turbofan engines, combining an attention-enhanced GRU–LSTM model for Remaining Useful Life (RUL) prediction with a Double DQN-based maintenance policy.
• Designed a TinyML-ready edge inference pipeline using post-training INT8 quantization, reducing memory footprint by 71.7% and accelerating inference by 5.18× with only a 1.35% increase in RMSE.
• Integrated RUL predictions with a Markov Decision Process to optimize maintenance scheduling, with the DDQN agent eliminating 100% of catastrophic failures across 200 simulation runs while extending average equipment usage to 19.5 cycles.

PROJECTS

TinyML Edge Inference Engine | *Skills: TensorFlow Lite Micro, C++, ARM Cortex-M, AVR Studio* — **2026**
• Deployed quantized (INT8) neural network models on AVR/ARM microcontrollers using TFLite Micro for real-time sensor data classification at the edge.
• Optimized memory footprint to under 64KB RAM, achieving sub-10ms inference latency for real-time IIoT systems.
• Used AVR Studio & LTSpice for hardware simulation, circuit validation, and power budget analysis of the embedded system.

Custom Unix Shell | *Skills: C, POSIX APIs, Process Control, IPC (Pipes), Signals, Job Control* — **2026**
• Developed a Unix shell in C using POSIX system calls (fork, exec, wait, pipe) with built-in commands, I/O redirection, background execution, and signal handling.
• Designed modular code structure with robust command parsing, job control, & error handling for extension and debugging.

Autocomplete & Word Suggestion Engine | *Skills: C++, Trie, STL* **2025**
• Designed an efficient auto-completion engine using Trie data structures in C++ for fast prefix-based lookup with dynamic updates and minimal latency on large dictionaries.

AgentOps — Autonomous Research Agent | *Skills: LangGraph, Tavily, Gemini, FastAPI* **2026**
• Built a ReAct-style agent that autonomously browses the web, summarises sources, and produces structured reports; reduced manual research time by 70% in internal user study (n=20).
• Added cost-control circuit breaker limiting token spend per session; saved 38% on API costs vs uncapped prototype.

Course Recommender System for Ed-Tech Website | *Skills: Python, Fast API, Pandas, Scikit-learn* **2024**
• **Developed** a hybrid recommender engine (collaborative + content-based filtering) to personalize course suggestions from student activity and performance, selected as a **Smart India Hackathon 2024 Finalist**.
• **Deployed** a Flask-based web app on a rural ed-tech platform & **improved** recommendation accuracy by **20%** and boosting student engagement on pilot data.

Smart Helmet System with Accident Detection | *Skills: ESP32, C++, MQTT, Python* **2025**
• **Built** IoT-enabled helmet using ESP32 to stream motion data via MQTT; applied threshold logic & time-series analysis for crash detection with **92% accuracy**.
• **Reduced** accident reporting latency to under **5 seconds**, enabling faster emergency response.

Intelligent Traffic Management System | *Skills: Python, Pandas, Keras* **2025**
• **Developed** an LSTM-based neural network to forecast traffic congestion from simulated urban traffic data, integrating Google Maps API for real-time scenario modeling.
• **Demonstrated** potential to reduce congestion and cut average commute times by **20%** in simulations, showcasing applicability for smart city infrastructure.

SKILLS

• **Languages:** C/C++, Python, Assembly (AVR/ARM), R, SQL, JavaScript, Shell Script, HTML/CSS
• **TinyML & Edge AI:** TensorFlow Lite for Microcontrollers (TFLM), CMSIS-NN, Apache TVM, Intermittent Computing, State Persistence, Edge Impulse, Model Quantization & Pruning, Knowledge Distillation
• **Frameworks:** NumPy, Pandas, Scikit-learn, TensorFlow, Keras, PyTorch, LangChain, LangGraph, Hugging Face Transformers, OpenAI API, Anthropic Claude API, OpenCV
• **ML & AI:** Machine Learning algorithms, Natural Language Processing (NLP),Large Language Models (LLMs), Generative AI, Agentic AI, Prompt Engineering, RAG (Retrieval-Augmented Generation), Fine-tuning, Time Series Forecasting, Regression Analysis, Cluster Analysis, Data visualization, n8n, Model Context Protocol(MCP), Vector DB
• **Tools:** Jupyter Notebook, Postman, VS Code, Flask, MATLAB, Git, Excel, Power BI, Tableau, LaTeX
• **Systems & DevOps:** Linux (Ubuntu), Git, GDB, MySQL, PostgreSQL, AWS, Docker, Django, REST, Fast API
• **Spoken Languages:** English (Proficient) Hindi (Native) German (A1 – CEFR)

CERTIFICATIONS & LICENSES

• **Certifications:** Introduction to Model Context Protocol, Anthropic Model Context Protocol: Advanced Topics, Anthropic JPMorgan Chase & Co. Quantitative Research Program, Forage

RELEVANT COURSEWORK

• **Electronics:** Basic Electronics Control Systems Digital Electronics Analog Electronics Mechatronic Systems Computer Networks Internet of Things Principles of Communication Systems Embedded Systems EDA for VLSI
• **CSE:** Computer Networks, Operating Systems, Analysis & Design of Algorithms, Database Management System, Introduction to Programming, Data Structures, Introduction to AI, Data Analytics, Deep & Reinforcement Learning.
• **Mathematics:** Probability & Stochastic Processes, Linear Algebra, Optimization, Advanced Calculus.

SCHOLASTIC ACHIEVEMENTS

• **Knight**, *Leetcode* | Rated 1900+ on LeetCode, demonstrating strong coding proficiency and problem-solving skills.
• **Finalist**, *Smart India Hackathon 2024* | Implemented an AI-powered educational recommendation system.
• **Finalist**, *Smart India Hackathon 2025* | Developed an AI-driven personalized EdTech platform at the SIH 2025 Grand Finale; the solution's innovation and scalability attracted interest from industry experts for potential funding and deployment.
• **Authored**, *Resilient Smart Healthcare, Springer 2026* | Authored a 32-page book chapter for an upcoming Springer Nature publication on Smart Healthcare Systems.

POSITIONS OF RESPONSIBILITY

Chairperson(Overall Head) | *Association for Computing Machinery - Women Chapter, GGSIPU EDC* **Oct 2025 - Current**
• Executed data-driven outreach and event marketing strategies that increased social media reach by 200%, attracted 200+ attendees per event.
• Secured 5L in sponsorship, demonstrating stakeholder management, growth marketing, & community-building capabilities.
Team Captain | *GGSIPU EDC Women's Basketball Team* **Mar 2026 -Current**
• Captained the GGSIPU EDC Women's Basketball Team, leading 12 players to a top-4 finish in inter-university tournaments.

EXTRACURRICULAR ACTIVITIES

• **Basketball,** secured silver medal twice at state-level tournaments.
• **Theatre & Poster Making,** represented school at the cluster level for dramatics & poster making.