Tarun Srivastava

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EDUCATION

Indian Institute of Engineering Science and Technology, Shibpur | B.Tech in Information Technology | CGPA: 8.82 *Aug 2023 – May 2027*

DonBosco Senior Secondary School | Higher Secondary Education | 85.4% *2021 – 2023*

H.P. Children's Academy | Secondary Education | 95.7% *2009 – 2021*

RESEARCH EXPERIENCE

Deepfake Detection (Images & Video) | under Prof. Shyamlendu Kandar | *Python, PyTorch, OpenCV, MediaPipe, Signal Processing* *Mar 2026 – Ongoing*

- Paper: "Periodic Gradient-Variance Suppression on SVD-Adapted Residuals for Cross-Generator Deepfake Detection" (preprint, under revision): periodic mask recalibration on SVD-adapted CLIP ViT-L/14 residuals, matching a Fishr-style invariance baseline (AUC 0.919, DF40)
- Next: extending to transformer-based and diffusion-based generative detectors, and to video via rPPG-based analysis (PhysFormer, spatio-temporal transformers)

Adaptive Privacy-Preserving Emergency Traffic Coordination (Final Year Project) | under Prof. Shyamlendu Kandar | *Python, Graph Signal Processing, Differential Privacy, PQC* *Aug 2026 – Ongoing*

- Paper: "Adaptive Spectral Privacy Budgeting for Emergency Traffic Coordination" (submitted, IEEE ICASSP 2027): allocates differential-privacy noise non-uniformly across the graph-spectral decomposition of traffic signals, protecting background traffic while preserving emergency-vehicle transients
- Scaling toward a 4-paper arc: post-quantum V2X authentication (CRYSTALS-Dilithium/Kyber), hierarchical federated learning for traffic prediction, and multi-agent intersection coordination

EXPERIENCE

Accenture | Advanced Application Engineering Analyst Intern | *GenAI, Agentic AI* *May 2026 – Jul 2026*

- Designed SoA Guardian, an adaptive multi-stage pipeline extracting and reconciling heterogeneous vendor Statements of Account (PDF/XLSX/CSV) into a canonical schema, grounded in 4 peer-reviewed document-parsing and schema-extraction papers
- Engineered a financial-arithmetic constraint solver validating running balances (opening + credits – debits = closing) via vectorized pandas, enabling deterministic checks on 20K+ row statements in milliseconds
- Replaced keyword-based column matching with embedding-based semantic schema mapping (sentence-transformers) plus LLM escalation fallback; debugged cross-vendor extraction failures
- Built adaptive extraction routing (pdfplumber/camelot, PaddleOCR, VLM fallback cascade) driven by document classification, plus a 5-tier human-in-the-loop audit and triage system

PROJECTS

LLM Persona Cloning & Optimization Pipeline | *PyTorch, HuggingFace, PEFT (LoRA), bitsandbytes, FastAPI*

- Fine-tuned Phi-2 2.7B on ~100K chat messages via LoRA; tuned rank/alpha to capture style without catastrophic forgetting; 8-bit quantization cut VRAM by 40% and latency by 30% on 6GB hardware; FastAPI backend achieved 25% BLEU improvement

PQC Scanner: Post-Quantum Cryptography Risk Analyzer (live) | Backend & Research Lead | *Python, FastAPI, PostgreSQL, Redis, Celery, Docker*

- Architected async distributed TLS scanning pipeline (FastAPI, Celery, Redis); built a crypto engine doing low-level TLS handshakes and parsing X.509 certificates and cipher suites
- Built post-quantum risk assessment modelling Shor's/Grover's threats and "Harvest Now, Decrypt Later" with 25+ scoring heuristics and CBOM generation mapping legacy crypto to NIST PQC standards (Kyber, Dilithium)

LLM-Powered Literary AI Studio | *PyTorch, QLoRA, FastAPI, Redis, Celery, Docker*

- Wrote custom sampling filters (Softmax, Top-K, Top-P) and fine-tuned Qwen/Llama via QLoRA for author-style mimicry; RAG memory store for plot continuity; XTTS/Bark narration; async FastAPI + Celery serving, Dockerized

CNN-Based Food Classifier | *Python, PyTorch, OpenCV* *Feb – May 2025*

- ResNet-50 transfer learning on Food-101 (101K images, 101 classes), 88.2% accuracy (+15% over baseline)

Quantum Circuit Simulations | *IBM Qiskit*: simulated Bell states, entanglement and superposition; validated results with >95% accuracy

SKILLS

Programming: Python, C, C++, Java, JavaScript, SQL, MIPS Assembly, VHDL
AI/ML & Data: Deep Learning (CNNs, Transformers, LLMs), NLP, Model Quantization, PyTorch, TensorFlow, scikit-learn, Hugging Face, OpenCV, bitsandbytes, Pandas, NumPy, Matplotlib
Backend & Frontend: FastAPI, Flask, REST APIs, JWT, HTML, CSS, JavaScript | **Quantum:** Qiskit, IBM Q
Tools: Git, GitHub, Linux (Ubuntu), Google Colab, VS Code, Docker