UTSAV NANDANIYA

Software Engineer & AI Systems Developer | Full-Stack, Deep Learning & Systems

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PROFESSIONAL SUMMARY

Results-driven Software Engineer and Computer Science undergraduate at BITS Pilani with 4+ years of hands-on experience engineering production full-stack platforms, high-throughput GPU-accelerated deep learning pipelines, and distributed business systems. Architected and deployed commercial ERP suites operating real-world textile manufacturing facilities, published mobile games with 1,000+ downloads to the Google Play Store, and engineered offline-first retail SaaS systems with algorithmic ML pricing. Author of the sci-fi novel 'Code of Existence'. Strong foundation in data structures, algorithms, computer vision, and systems architecture.

TECHNICAL SKILLS

Languages: Python, TypeScript, JavaScript, Dart, C#, C++, Java, Kotlin, SQL, HTML5/CSS3
AI & Computer Vision: PyTorch, Computer Vision (OpenCV, InsightFace, ArcFace R100), CUDA GPU Acceleration, Deep Learning
Frontend & 3D Web: React 19, Next.js 15, Three.js, React Three Fiber (R3F), Tailwind CSS, GSAP, Zustand, WebGL
Mobile & Desktop: Flutter, Android SDK, Cross-Platform Architecture, Offline-First Mobile Systems, SQLite
Backend & DevOps: PostgreSQL, SQLite, Docker, Ubuntu Linux Server, Git, GitHub Actions, CI/CD Pipelines, REST APIs
Embedded & Hardware: Arduino UNO R4 WiFi, IoT (Blynk), RFID/NFC, Autodesk Fusion 360 (Parametric CAD), 3D Prototyping

WORK EXPERIENCE

Freelance Software Engineer & Solutions Architect — **2022 — Present**
SaphireScape (Independent Engineering Studio) — *Bengaluru / Remote*

- **Commercial ERP Deployment:** Architected, developed, and deployed custom inventory ERP systems for commercial textile manufacturing enterprises; automated multi-stage stock reconciliation and batch ledgers, eliminating manual paperwork and reducing stock discrepancies by 95%.
- **High-Performance Web Platforms:** Engineered corporate web platforms (e.g. Perfume Processors) using Next.js 15, TypeScript, and Tailwind CSS; achieved sub-0.8s Largest Contentful Paint (LCP), 100/100 Lighthouse performance, and zero downtime.
- **Infrastructure & DevOps:** Configured containerized Docker application deployments on Ubuntu Linux servers; automated off-site database backups, SSL/TLS certificates, and CI/CD pipelines, accelerating client deployment cycles from hours to under 5 minutes.

KEY PROJECTS

ThreadFlo — Enterprise Textile ERP & Manufacturing Ledger — **Production System**
Technologies: Flutter, Dart, SQLite, Docker, Ubuntu Server, Git — *Textile Sector*

- **Industrial Manufacturing ERP:** Engineered an offline-first inventory suite managing multi-stage yarn/dye processing batches, barcode scanning, and multi-tenant ledger accounting across active textile facilities with 10,000+ SKU records.
- **Containerized Infrastructure:** Packaged server-side infrastructure into Docker containers on Ubuntu Server; implemented automated client update distribution and local SQLite cryptographic snapshotting for 99.9% data reliability.

Face Recognition Sorter — GPU-Accelerated Clustering Engine — **Open Source**
Technologies: Python, PyTorch, InsightFace, ArcFace R100, CUDA, OpenCV — *AI / Computer Vision*

- **High-Throughput Feature Extraction:** Developed a GPU-accelerated deep learning clustering tool extracting 512-dimensional facial embedding vectors via ArcFace R100, achieving 99.8% identity classification accuracy on unconstrained photo collections.
- **CUDA Tensor Acceleration:** Leveraged CUDA GPU tensor operations and cosine distance clustering to achieve a 10x throughput speedup over CPU baselines, processing 5,000+ high-resolution images in under 3 minutes.

Supermarket Inventory & AI Retail Suite — Commercial POS Platform — **Commercial SaaS**
Technologies: Flutter, Dart, SQLite, Cloud Sync, Machine Learning — *Retail Sector*

- **Offline-First Point-of-Sale:** Engineered a high-frequency retail checkout and inventory platform with camera and hardware barcode scanning, instantaneous ledger reconciliation, and offline-first SQLite persistence.
- **Algorithmic Promotion Engine:** Built an embedded machine learning recommendation module analyzing sales velocity and shelf turnover to dynamically suggest optimal promotional discounts and inventory reorder points.

IoT Smart Gate Remote & Physical Security Controller — **Hardware / Firmware**
Technologies: Arduino UNO R4 WiFi, C++, Blynk IoT, NFC/RFID, Fusion 360 — *Embedded Systems*

- **Dual-Channel Access Controller:** Architected an embedded IoT gate automation system integrating 2.4GHz WiFi cloud triggers via Blynk with physical 13.56MHz RFID/NFC cryptographic badge verification on Arduino UNO R4.
- **Parametric Mechanical CAD:** Modeled and 3D-printed a custom weather-resistant enclosure in Autodesk Fusion 360, precisely accommodating microcontroller pinouts, relay actuators, status LEDs, and antenna clearance.

EDUCATION

BITS Pilani (Birla Institute of Technology and Science) — **2026 — 2030**
Bachelor of Science (B.Sc.) in Computer Science — *Bangalore, India*

- **Core Coursework:** Data Structures & Algorithms, Artificial Intelligence, Machine Learning, Computer Graphics, Distributed Systems, Object-Oriented System Design, Relational Database Management Systems.

HONORS & HIGHLIGHTS

- **Author of Sci-Fi Novel 'Code of Existence':** Authored a speculative science fiction novel exploring artificial intelligence, consciousness, and algorithmic determinism; showcases advanced narrative synthesis and technical written communication.
- **Shipped Google Play Game at 16:** Engineered and released original arcade mobile game 'Sky Surge' (Unity/C#) to the Google Play Store with 1,000+ players.
- **Dye Formulation Algorithmic Tool:** Developed a mathematical multi-pigment recipe optimizer for industrial textile dye houses in Python to compute target color tolerances.
- **Autonomous Engineering Journey:** Self-taught developer coding since 5th grade (first Python script at age 12); designed and delivered production ERP systems now in commercial enterprise use.