

Uday Pratap Singh Atwal

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EDUCATION

Thapar Institute of Engineering and Technology

M.E. in Computer Science and Engineering

B.E. in Computer Science and Engineering

Patiala, Punjab, India

Aug 2026 - Present

Sep 2022 - Jun 2026

RESEARCH INTERESTS

Cybersecurity and AI, Mechanistic Interpretability, Compilers

EXPERIENCE

Co-Founder

Stratalis Tech

Dec 2025 - Present

Patiala, India

- Co-founded a company building software for electricity distribution utilities. Building **Discom360**, a cloud-native platform covering meter data, billing intelligence, field operations and consumer applications.
- Took the product from first design to production, including architecture, deployment and app store releases.
- Shipped two production mobile apps on iOS and Android: a consumer app for billing, payments, consumption and grievances, and an offline-first field app for installation and service crews.
- Own technical direction across backend, data, mobile, infrastructure and security, and lead the engineering team.

Co-Founder & CTO

RetailQ (RTLQ Tech Pvt. Ltd.)

Aug 2022 - Feb 2026

Patiala, India

- Co-founded a point-of-sale and operations software company for MSME retailers and restaurants. At its peak, **190+ franchises across Punjab** ran on the platform, which was later rebranded as **FloPOS**.
- Architected infrastructure for 3 in-house retail products using Docker, Apache and PHP, isolating each store's backend behind its own subdomain.
- Built plug-and-play thermal receipt printing from the browser over WebUSB.
- Developed an OCR and Mistral-based product categorisation pipeline that cut manual catalogue entry time by 50%.
- Led AI and infrastructure R&D for semantic reasoning and tool-calling with **Mistral Small** and **llama.cpp**, covering model selection, latency testing and deployment constraints.

Project Lead, AI/Software Engineering Intern

CodeInsight Technologies (P) Ltd

Jun 2025 - Aug 2025

Mohali, India

- Led development of **LogWise**, a production-focused multi-agent RAG system that generates SQL from multi-file log schemas and returns grounded answers.
- Designed schema graphs with BFS traversal, hierarchical indexing and community summaries, and unified Milvus, SQLite and MySQL into one retrieval layer, using reranking to cut hallucinations.
- Directed evaluation harnesses for SQL accuracy and task success. Stack: Python, Milvus, SQLite, MySQL, Qwen 3 8B, Ollama, llama.cpp

Research Intern, Backend Team Lead

Thapar Institute of Engineering and Technology | Timetable Generation

Jan 2024 - 2026

Patiala, India

- Led and designed the backend architecture as a set of microservices, and built all of its APIs.
- Modelled hard and soft scheduling constraints and solved them with genetic algorithms to generate institutional timetables across 25+ departments.
- Owned data cleaning, consolidation and presentation across departments. Built a Next.js and LAMP dashboard for interactive editing by faculty, making the feedback cycle 3× faster than manual PDFs.
- Guided by Prof. Rajkumar Gupta and Prof. Tarunpreet Bhatia. Stack: PHP, MySQL, Apache httpd, Next.js

Software Developer Intern, Backend Team Lead

Thapar Institute of Engineering and Technology | Feedback App

2024 - 2026

Patiala, India

- Led and designed the backend architecture for the **TIET Feedback App**, now live across the institute on the App Store and Play Store.

- Designed role-based access control and state management across 7+ user types using Flutter, REST APIs and a LAMP backend.
- Built analytics pipelines on Apache Kafka and modular PHP microservices, powering a Next.js dashboard that gives TIET's academic leadership real-time visibility.
- Stack: PHP, Python, Kafka, Apache httpd, Next.js, Flutter

RESEARCH

- **BEACON: A Multimodal Dataset for Learning Behavioral Fingerprints from Gameplay Data**

I. Singh, G. Kaur, U. P. S. Atwal, G. Singh, G. Singh, M. Singh. *arXiv preprint*, 2026. [arXiv:2605.10867](https://arxiv.org/abs/2605.10867)

Built the data pipeline and the participant upload server, provided the GPU infrastructure and supervised the collection lab. Aggregated, cleaned and released the **445 GB** dataset (79 sessions, 28 participants, 102.5 hours) on [Hugging Face](#), alongside the [BEACON-Logger](#) capture software. Further papers in preparation.

PROJECTS

- **Machine Monitoring HMI**, built for Trident Group

Sole developer of a real-time on-site system that monitors PLC-controlled machines through their screens, using computer vision and statistical models on low-powered devices. Deployed on production floors to monitor 30+ machines, reducing manual error correction time by 45%.

Tech: Python, OpenCV, Tesseract OCR, MediaPipe, NumPy, Pandas

- **Learning Platform for PSPCL**

Deployed a Moodle-based MOOC platform for the Technical Training Institute of Punjab State Power Corporation Ltd. (PSPCL), Govt. of Punjab, on open-source infrastructure.

- **Local LLM Inference Lab**

Heterogeneous and distributed LLM serving across NVIDIA and Apple Silicon hardware with llama.cpp, vLLM and MLX, studying quantization, CPU/GPU offload and MoE inference trade-offs.

ACHIEVEMENTS

- **Finalist (Top 10 nationally)**, Bharatiya Antariksh Hackathon, ISRO. *5,400+ participants*. 2025
- **Runner-Up (2nd place)**, PyTorch, AMD & Unsloth Synthetic Data AI Agents Challenge. *Out of 90+ teams*. 2025
- **Winner**, OWASP TIET Internal Hackathon. 2023
- **Finalist**, HackTU 4.0, Creative Computing Society, TIET. *Top 10 out of 500+ participants*. 2023
- **1st Runner-Up**, Smart Punjab Hackathon, hosted by Saturnalia, TIET. 2022

TECHNICAL SKILLS

- **Languages:** Python, PHP, JavaScript, TypeScript, C++ (intermediate), Dart (intermediate), Shell Script (Bash)
- **Web & Mobile:** React.js, Next.js, AngularJS, TailwindCSS, shadcn/ui, Flask, Flutter, Apache httpd
- **ML:** PyTorch, TensorFlow, Pandas, NumPy, OpenCV, YOLO, llama.cpp, Ollama, vLLM, MLX, Unsloth, MCP, LangChain
- **Data:** MySQL, PostgreSQL, MongoDB, Redis, Apache Kafka, Firebase, Appwrite
- **Infra & Cloud:** Docker, LXC, Kubernetes, Proxmox VE, GitHub Actions, GNU/Linux, FreeBSD, Cloudflare, AWS, GCP, Vercel, Azure
- **IoT:** DLMS/COSEM, IS 15959, cellular IoT, Raspberry Pi, ESP32, RP2040, Arduino

LEADERSHIP & TECHNICAL OUTREACH

- Sole tech lead for one of SAIC's flagship events at TIET, a capture-the-flag competition for 300+ students. Built and hosted the entire event stack single-handedly.
- Contributed to 4 university societies (MLSC, OWASP, EDC and SAIC, TIET), leading technical teams for events with 500+ attendees in total.
- Delivered hands-on workshops on Git, HTML/CSS and backend fundamentals to 100+ students.