

Chaitanya Upadhyay

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SUMMARY

Engineer by training, systems thinker by obsession. I operate at the intersection of simulation, optimization, and real-world performance. My projects span Military UAV design, Aerodynamic Innovation, and multi-objective AI optimization—all driven by a mindset of precision, leadership, and world-changing ambition. I don't just solve problems—I architect systems that shift paradigms. I lead teams, model complexity, and translate technical depth into strategic outcomes. Now seeking a role where I can build, disrupt, and deliver at the highest level of intensity.

WORK EXPERIENCE

Circular Aircon Private Limited

Mumbai, India

Intern, HVAC Design Engineering & Optimization

[12/2024] – [04/2025]

- Re-engineered four HVAC projects (16.6 TR luxury residence → 200 TR office) into cap-table workbooks; quantified <5-yr payback and 18 % energy-cost IRR, informing vendor negotiation strategy.
- Bench-marked designs against ASHRAE 55/62.1/90.1 and ECBC 2017—mirroring technical due-diligence in infrastructure M&A.
- Authored 40-page technical-finance report (Grade A+, 93 %)—demonstrated ability to translate engineering risk into investment impact.

PROJECTS

RAG-Driven Psychiatric AI Assistant (Personal R&D)

Mumbai, India

[06/2025] – [present]

- Architecting a privacy-first GenAI integration: WHO ICD-11 → Chroma vector DB → Dockerised Mistral-7B micro-service → Streamlit UI; Parsed and embedded over 16,000 ICD-11 JSON medical entities from the WHO API into vector storage with rich metadata for fast semantic retrieval.
- End-to-end pipeline included: data crawling, preprocessing, chunking, embedding, RAG architecture, citation-aware generation, and user-facing UI—all orchestrated independently.
- 100% vendor-agnostic, privacy-preserving, and auditable—aligns with production-ready architecture for regulated domains like Legal and Healthcare.

Blended Wing Body vs Conventional Jet – Capstone

Mumbai, India

[06/2024] – [09/2024]

- Designed and compared BWB vs conventional jets using CFD.
- Applied SST $k-\omega$ turbulence modeling for performance benchmarking.
- Delivered a strategic design report including technical findings, structural trade-offs, and feasibility metrics.
- Positioned for pre-publication as a whitepaper in aerospace journals.

UAV Development & Trade-Off Analysis

Mumbai, India

[10/2023] – [06/2024]

- Generated three configurations; CFD & XFOIL optimisation delivered > 10 % drag reduction and 11 % airframe weight saving.
- Led a 10-member technical team, managing trade-offs in structural weight, cost, and power.
- Focused on mission-readiness, modularity, and flight performance under variable conditions.

EDUCATION

Mukesh Patel School of Technology Management and Engineering, NMIMS

Mumbai, India

Bachelor of Technology in Mechanical Engineering

[Expected Aug, 2025]

- Final Semester GPA:** 4.00/4.00 (Highest academic performance; reflects late-stage maturity)
- Cumulative GPA:** 2.94/4.00 (Upward trend; consistent improvement)

SKILLS

Advance: *Systems Integration, Excel (Power Query, VBA, PivotTables, scenario models), Python (pandas, NumPy, Risk folio-Lib, Streamlit), Systems Engineering, HVAC systems, AI/ML – prompt-engineering & RAG pipelines, PowerPoint & Git, Aerospace and Defense engineering, Team Leadership, SQL (multi-table JOINS), CAD, ANSYS Fluent/CFD, Founder & Investor updates, 1 pager specs, C suite demos*

Intermediate: *Transformer architecture & LLM fine-tuning, Docker, Bash/CLI, Git; RAG architecture & vector DBs (ChromaDB / FAISS), LLM orchestration & prompt-safety, Streamlit & Plotly dashboards, Docker + Poetry, AWS EC2/S3 fundamentals, ETL & REST-API integration, MATLAB/Octave, DevOps CI/CD*

Learning: *MECE & 80/20 analysis, TAM/SAM/SOM sizing, 3-statement modeling, DCF, IRR, scenario sensitivity*

Languages: *Fluent in English; Conversational Proficiency in Hindi as well*

CERTIFICATIONS, ACTIVITIES, & INTERESTS

Certifications & Training: Indian Science Olympiad – Bronze, IELTS 7.5, National Polio Immunization Volunteer (Ops & Logistics)

Activities: Flight Simulation (VATSIM-certified), Jeet Kune Do & Stoic Discipline, Logistics Lead – Rotary Polio Drives

Interests: AGI & cognitive architectures, Retrieval-Augmented Generation (RAG), Multimodal LLMs, Vector search & embeddings, AI safety / guard-rails, Edge inference & TinyML, Generative design for aerospace and biotechnology