

Chaitanya Vikas Upadhyay

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SUMMARY

Analytical engineer with experience in mechanical systems optimization, aerospace trade-off analysis, and structured research across multiple domains. Skilled in market benchmarking, competitor analysis, and translating complex data into strategic insights. Demonstrated ability to rapidly learn new industries and deliver executive-ready reports.

SKILLS

Consulting & Research: Market sizing, competitor benchmarking, regulatory reviews, scenario modeling, Porter's 5 Forces

Financial Analysis: Capex/Opex modeling, IRR/payback calculations, cost-benefit evaluations

Technical Knowledge: Mechanical systems, Industry 4.0 implications, HVAC optimization, Aerospace design trade-offs, GAN, CNN, RAG Architectures, Transformers.

Consulting Deliverables: Executive memos, insight synthesis, structured reports, slide decks

Tools: Excel (advanced), PowerPoint, Python (data analysis), SQL, CATIA, SolidWorks, ANSYS

CERTIFICATIONS

- IBM Data Fundamentals Certification
- Full Stack Web Developer (Angela Yu) – UDEMY

EXPERIENCE

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

Mumbai, India

Self-initiated

[06/2025] – [present]

- Architecting a privacy-first GenAI integration: WHO ICD-11 → Chroma vector DB → phi3:medium LLM integration → Gradio 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.

Independent Market Research – Emerging Mobility & EV Trends

Mumbai, India

Self-initiated

[04/2025] – [05/2025]

- Conducted structured secondary research on India's EV adoption and supply chain trends, mapping key players and regulatory shifts.
- Produced a competitive landscape memo outlining market growth scenarios and Industry 4.0 implications for assembly lines.
- Applied Porter's 5 Forces and value chain frameworks to identify competitive differentiators in emerging mobility models.

Circular Aircon Private Limited

Mumbai, India

Intern, HVAC Design Engineering & Project Optimization

[12/2024] – [04/2025]

- Benchmarked HVAC projects (16.6–200 TR scale) against ASHRAE 55/62.1/90.1 and ECBC 2017 standards, informing vendor negotiation strategy.
- Built 5-year payback and IRR models, reducing projected energy costs by 18% and guiding procurement decisions.
- Authored a 40-page technical-financial report and executive presentation aligning engineering risk with investment impact.

Blended Wing Body vs Conventional Jet – Capstone Project
Final Year Project

Mumbai, India
[07/2024] – [11/2024]

- Designed and compared BWB vs conventional jets using CFD. Applied SST k- ω 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. Received 93/100 (A+) for Capstone Report and Presentation presented to an external panel.

UAV Development & Trade-Off Analysis, NMIMS
Team Lead

Mumbai, India
[12/2023] – [05/2024]

- Generated three configurations; CFD & XFOIL optimization 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
Bachelor of Technology in Mechanical Engineering

Mumbai, India
[07/2019] – [06/2025]

- Final Semester GPA:** 4.00/4.00 (Highest Distinction)
- Cumulative GPA:** 2.94/4.00 (Upward trend; consistent improvement)
- Relevant Modules:** Aerodynamics, Finite Element Analysis, Programming for problem solving (C, C++), Heat transfer, Management Accounting for Engineers, Financial Instruments and Markets, Quantum Physics, Intelligence of Biological Systems.

Pace IIT
Higher Secondary Certificate, Maharashtra

Mumbai, India
[04/2017] – [03/2019]

- Specialization:** Science
- Modules:** Physics, Chemistry, Mathematics, Electrical Maintenance, English, Hindi.

ACTIVITIES & INTERESTS

- Flight Simulation (VATSIM-certified)
- Jeet Kune Do & Stoic Discipline
- Aerospace Systems
- Biotech Research
- Life Support Systems for Space Flight
- AGI & cognitive architectures
- Multimodal LLM
- AI safety.