AKHIL VASHISTHA

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EDUCATION

Indian Institute of Technology Delhi, *New Delhi, India* July '25 - Present
M.Tech in *Machine Intelligence & Data Science* GPA: **8.73** (Department Rank: **6**)

Indian Institute of Technology Madras, *Chennai, India* Sept '21 - June '25
B.S. in *Data Science & Its Applications* GPA: **8.88**
Minor in Economics and Finance GPA: **10**

KEY PROJECTS

End-to-End Hindi Voice Cloning (F5-TTS) | *PyTorch, NLP, Kaggle* | *independent Project* *Winter '25*

- Developed a **Zero-shot Hindi Voice Cloning** system using **F5-TTS (Flow Matching)**, enabling high-fidelity speech synthesis from short reference clips.
- **Fine-tuned** large-scale transformer models on the **Kathbath dataset**, adapting studio-grade checkpoints to handle real-world, noisy speech data.
- Engineered a custom inference pipeline integrating **Whisper ASR**, resolving multilingual script hallucinations to ensure accurate **Hindi (Devanagari)** text generation.

Concrete Strength & RCC Suitability ML Pipeline | *ML Project* | Link *Winter '25*

- Engineered domain-driven features (Water/Cement ratio, Total Binder, Log-age) and handled class imbalance via SMOTE to build a dual-task regression/classification pipeline.
- Optimized a LightGBM model achieving R^2: 0.93 and RMSE: 4.33 MPa, significantly outperforming SVR and linear benchmarks.
- Developed a tuned Logistic Regression classifier for RCC suitability (IS 456:2000), attaining a 0.996 F1-score and 0.999 AUC.

Stones & Rivers Game | *Python, C++, PyBind11, CMake* | Link *Fall '25*

- Built a competitive AI agent using **Minimax with Alpha-Beta Pruning** and Iterative Deepening to optimize decision-making under strict time constraints.
- Implemented **Zobrist Hashing** for efficient state caching (Transposition Tables), significantly reducing search space and redundant computations.
- Designed a custom heuristic function evaluating piece mobility and board control, enabling the agent to execute complex tactical maneuvers against stochastic opponents.

Disaster Relief Logistics Simulation | *AI Project* | Link *Fall '25*

- Formulated the relief operation as a **Constrained Vehicle Routing Problem (CVRP)**, optimizing helicopter schedules under strict **payload, range, and fuel constraints**.
- Implemented **Simulated Annealing** and **Greedy Search** algorithms to maximize a custom utility function (Humanitarian Value vs. Operational Cost), efficiently navigating large state spaces to escape **Local Optima**.

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 452 / Top 0.8%** in GATE DA 2025 among 60,000 students
- Awarded the **S** (highest) **grade** in 7 courses including AI, Game Theory & Corporate Finance
- Achieved an **A grade** in 8 courses including DSA, Deep Learning & Advanced Algorithms
- Bagged **rank 6** on Kaggle in ML contest organized for BS students by IIT Madras

TECHNICAL SKILLS

- **Programming** Python, C/C++, bash, Vuejs, SQL, OOPS
- **Tools** Linux, Github, PostgreSQL, SQLite, QGIS, Redis, LaTeX, MS Office
- **Libraries** PyTorch, Tensorflow, Keras, NLTK, TextBlob, NumPy, Pandas, SciPy, Flask

POSITIONS OF RESPONSIBILITY

Teaching Assistant, IIT Delhi | *COL1000 Introduction to Programming* *Fall '25*
Helped students with algorithmic & debugging logic to write semantically & syntactically correct code