

PRANAY PANDEY

2K23/CS/308 – DTU

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EDUCATION

B.Tech (Computer Science Engineering)	2023–2027	Delhi Technological University, New Delhi	7.71 CGPA
CBSE (Class XII)	2021–2023	Sant Gyaneshwar Model School, Delhi	83.6%
CBSE (Class X)	2009–2021	Hansraj Model School, Punjabi Bagh	94%

EXPERIENCE

Machine Learning Intern, Defence Research and Development Organisation (DRDO) Jun 2025–Jul 2025

Technologies: Python, NumPy, NLTK, Scikit-learn, Node2Vec, K-Means, Fuzzy C-Means, FuzzyWuzzy, FastAPI, SQLite, Tortoise ORM

- Led 3+ Agile sprints for end-to-end design and development of the Python Microservice for entity recommendation, adapting to feedback and evolving scopes, ensuring seamless integration with FastAPI, SQLite, and Tortoise ORM to support high-concurrency data transactions.
- Engineered a hybrid engine with K-Means, Fuzzy C-Means, Node2Vec graph embeddings, and TF-IDF-enhanced fuzzy sets, applying robust NLP to achieve high system accuracy and 530ms average response time in a high-volume request environment.
- Produced comprehensive documentation and standards-driven RESTful APIs, facilitating reliable and seamless integration across a microservice architecture. Maintained deployment with zero rollbacks throughout the development cycle.

ACADEMIC PROJECTS

RAG-Driven Document Q&A and Smart Chat-Bot Platform [\(GitHub Link\)](#)

Technologies: LlamaIndex, Hugging Face, GroqAPI(LLaMA-4), FastAPI, Google OAuth2, JWT, Node.js, Express, MongoDB

- Created a full-stack MERN web app with a Python-based RAG microservice using LlamaIndex, Hugging Face, and Groq-hosted LLaMA 4 for real-time, multi-document semantic search and citation-rich responses, delivering precise context-aware answers.
- Engineered a robust 13-class query classifier with custom prompt adaptation based on user intent, enabling fallback handling and reducing hallucinations by managing context across multi-turn conversations, ensuring factual accuracy and precision.
- Designed a responsive vanilla-JS frontend supporting drag-and-drop uploads, custom chat UI, dark/light theme toggle, secure JWT-based auth (OAuth2/local), and persistent user history with real-time document indexing and dynamic content retrieval.

Modular C++ Ride-Sharing System - UBER DevClone [\(GitHub Link\)](#)

Technologies: C++, Drogon Web Framework, RESTful APIs, Domain-Driven Design, CMake, System Design, Geospatial Algorithms

- Built a scalable and decoupled C++ backend utilizing a 4-layer Domain-Driven Design (DDD), enforcing strict boundaries to isolate the core pricing and matching engines from infrastructure and network dependencies.
- Applied Adapter and Repository design patterns to create decoupled infrastructure for swappable components (map APIs, DBs).
- Developed core functionalities via a high-performance REST API using the Drogon framework, featuring dynamic fare calculation with surge pricing and an efficient driver matching algorithm optimized to sustain high throughput and low-latency performance.

YOLO-Powered Real-Time Multi-Class Object Detection System [\(GitHub Link\)](#)

Technologies: OpenCV, PyTorch, NumPy, Pandas, Scikit-learn, Ultralytics-YOLOv8, COCO-Dataset, Convolutions, Transfer Learning

- Developed and fine-tuned an efficient YOLOv8-nano detection system using COCO pre-trained weights and custom traffic annotations, achieving 85%+ accuracy and 24+ FPS real-time performance on live video streams using standard CPU hardware.
- Implemented automated data preprocessing workflows resulting in 72% data quality improvement, and deployed multi-platform inference pipelines optimized for edge computing (2GB deployment) and cloud scalability via containerized deployment.

TECHNICAL SKILLS

- **Core Programming Languages:** Python, Java, C/C++, Rust
- **Web Development:** HTML, CSS, Bootstrap, JavaScript, React, Express, Node.js, FastAPI, REST, GraphQL, NextJS, Vercel, OAuth2
- **Databases & Infrastructure Tools:** Redis, MongoDB, MySQL, AWS S3, Neo4j, Git, Docker, Linux, Bash Scripts
- **ML & AI:** NumPy, Scikit-learn, PyTorch, TensorFlow, OpenCV, YOLOv8, Transformers, Hugging Face, LlamaIndex, GenAI
- **Computer Science Fundamentals:** System Design (HLD, LLD), Operating Systems, Computer Architecture, Compiler Design, Distributed Systems, Parallel Computing, Computer Networks, Database Management, Object-Oriented Programming

ACHIEVEMENTS AND CERTIFICATIONS

- **2nd Place, Adobe Invictus DevCraft Hackathon** – Engineered Naive Bayes Document Classification Model (95%+ accuracy)
- **Machine Learning Specialization** (DeepLearning.AI & Stanford) – Supervised Learning, Unsupervised Learning, Reinforcement Learning and Advanced Learning Algorithms (Regression, Clustering, Ensembles and Recommender Systems) – [\(Certificate\)](#)
- **Deep Learning Specialization** (DeepLearning.AI) – Neural Networks and Deep Learning, Sequence Models, Convolutional Neural Networks (Natural Language Processing, Transfer Learning, Transformers, RNNs, LSTMs and Hugging Face) – [\(CL1\)](#) [\(CL2\)](#) [\(CL3\)](#)
- **Generative Adversarial Networks (GANs) Specialization** (DeepLearning.AI) – [\(Certificate\)](#)
- **250+ LeetCode** Data Structures and Algorithms Problems Solved (Python and Java) – [\(LeetCode Link\)](#)