

# Ayush Kumar Pushp

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## Education

### IET Alwar, Bikaner Technical University

*B.Tech in Mechanical Engineering*

CGPA: 8.1

Rajasthan

2019–2023

### Indian Institute of Science (IISc)

*M.Tech in Computational and Data Science*

Cumulative GPA: 8.2 (after First and Second Semesters)

Bengaluru

2024–2026

**Key Courses – First Semester:** Numerical Linear Algebra, Stochastic Models and Applications, Introduction to Scalable Systems, Introduction to Data Science

**Key Courses – Second Semester:** Natural Language Processing, Machine Learning, Numerical Optimization

**Teaching Assistant (Numerical Linear Algebra, IISc):** Conducted tutorials, helped students with assignments, and assisted in grading for the NLA course.

## Internship Experience

### Nokia

*Summer Intern*

May 2025 – July 2025

- Developed a Retrieval-Augmented Generation (RAG) system using LangChain with Elasticsearch as the vector database.
- Designed and implemented the end-to-end RAG pipeline, including LLM routing for query-type-based response generation.
- Decomposed user queries into parallel sub-queries to speed up retrieval and improve overall latency.
- Integrated the RAG backend with a React-based UI for seamless user interaction.
- Optimized retrieval by parallelizing key components in the query and document retrieval stages.

## Projects and Assignments

**PageRank Algorithm:** Applied the PageRank algorithm using power iteration.

**Image Compression:** Implemented image compression using Singular Value Decomposition (SVD).

**Parallel Programming:** Developed parallel implementations of array search using MPI and prefix sum using CUDA.

**Data Structures and Algorithms:** Designed a customer clustering algorithm based on common interests.

**Image Segmentation:** Performed image segmentation using k-means clustering.

**Classification with SVM and SVM Dual:** Implemented Support Vector Machine (SVM) and its dual formulation for classification on the Diabetes dataset, optimizing decision boundaries for improved accuracy.

**Clustering with K-Means and Gaussian Mixture Models (GMM):** Applied K-Means and GMM for classification on the MNIST dataset using unsupervised learning techniques.

**Text Classification:** Applied Naïve Bayes and Word2Vec for efficient text classification, optimizing feature representation.

**Text Generation:** Designed text generation models using FFNs and RNNs to capture linguistic patterns and generate coherent text.

**Transliteration from Hindi to English:** Implemented a Seq2Seq model with RNN and attention mechanism for accurate transliteration of names.

**Image Classification and Segmentation:** Developed classification pipelines using CNNs and XGBoost to distinguish healthy vs. unhealthy leaves; implemented semantic segmentation using DeepLabV3 with ResNet50 backbone.

## Hackathons

**Capital One Hackathon:** Developed a farming assistant agent for farmers using Qwen-3 7B and the IndicTrans2 translation model. Implemented machine learning pipelines for soil image-based classification, crop recommendation based on soil type, weather-aware suggestions, and pest identification.

**AMD AI Hackathon (2025):** Built a scheduling agent using the DeepSeek 7B model and vLLM.

**College Hackathon (2024):** Developed a chatbot using Transformer-based language models and the Anthropic API.

**Coding Contest (B.Tech 1st Year):** Won a C++ programming contest organized in college.

## Technical Skills

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**Languages:** C++, Python

**Frameworks:** LangChain

## Achievements

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**GATE Rankings:** Ranked AIR-4 in XE and 177th in ME in the GATE 2024 examination.

**Kaggle Competition Winner:** Secured Rank 1 in the Kaggle competition "MLDS Assignment 2: ML & DL" focused on image classification and segmentation of healthy vs. unhealthy leaves using CNNs, XGBoost, and DeepLabV3 with ResNet50.

## Co-Curricular Activities

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**Football (IISc, 2026):** Silver Medalist in Departmental Football Tournament

**Debate Competition:** Won Debate Competition in College Fest (B.Tech, 1st Year)

**Quiz Competition:** Won Quiz Competition (B.Tech, 1st Year)

## Positions of Responsibility

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**Hostel Representative:** Represented hostel residents in student council meetings, addressing issues related to hostel.

**House Captain (School):** Led the house team in various inter-house activities, fostering teamwork and participation.