

# PARAM THAKKAR

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## Education

### Veermata Jijabai Technological Institute

Bachelor of Technology in Computer Engineering - CGPA: 7.58 (Till Sem 6)

Nov 2022 – Present

Mumbai, Maharashtra, India

### JES Junior Science College

Higher Secondary Education - HSC: 89.5%, MHT-CET: 99.68%ile, JEE-Mains: 97.74%ile

Mar 2020 – May 2022

Jalna, Maharashtra, India

## Relevant Coursework

- Data Structures
- Algorithms
- Software Engineering
- Machine Learning
- Deep learning
- Database Management
- Artificial Intelligence
- Internet of Things
- Operating Systems
- Computer Architecture

## Experience

### National Payments Corporation of India (NPCI)

Data Science Intern

May 2025 – Aug 2025

Mumbai, Maharashtra, India

- Implemented a **Retrieval Augmented Generation (RAG)** system for perform RAG on official documents using open source **Large Language Models**
- Prepared all RAG architectures for Model and Architecture benchmarking for determining the best model for a particular use case
- Developed a system from scratch which lets users benchmark, optimize and fine tune LLMs at scale with no coding experience required

### Open Source Contributor at SciML- Scientific Machine Learning

Open Source Contributor

May 2024 – Aug 2024

Remote

- Refactored code to optimize precompilation and loading times for 25+ solver modules in OrdinaryDiffEq.jl, a pure Julia differential equations library.
- Segmented complex solver packages into 15 modular subpackages in OrdinaryDiffEq.jl, enhancing code clarity, team productivity, and project turnaround time.
- **Optimized precompilation times** from **2.46 seconds** initially to **0.56 seconds** achieving a **76% reduction** through targeted performance enhancements..

### PumasAI

Product Developer Intern

Mar 2025 – Jul 2025

Remote

- Worked on developing a **Model Context Protocol (MCP)** server for **Pharmacometric Research and Analysis in Julialang**.
- Created tools for **plotting, faceting, dataframe** operations useful in pharmacometric analysis using **SummaryTables.jl, DataFrames.jl** and **PharmaDatasets.jl**
- Improved evaluation of **Julialang** code by implementing static code analysis using **JET.jl** and **StaticLint.jl**

## Projects

### Lofi Music Generation with Deep learning | React.js, FastAPI, Pytorch, Three.js— Github

Nov. 2023

- Engineered a model pipeline using **LSTMs** and **GANs** for automated **Lofi music production**, cutting generation time by **50%** for **instantaneous** track outputs.
- Authored deep learning models for Lofi music, including a **5M-parameter VAE, GAN on 50,000 tracks**, and **3-layer LSTM**, improving melody coherence by **20%** and reducing FastAPI response time by **30%**.
- Organised backend mechanisms with **MongoDB, Node.js, Express.js, and JWT** for user authentication.

### Data Extraction and Summarization using LLMs | Llama, Streamlit, Groq, Langchain — GitHub

Apr. 2024

- Extracted relevant information from text and PDF documents using the **meta-llama-13b-chat-hf** model efficiently.
- Employed **Groq API** to achieve a a total of **98.3%** optimization in inference time from 6 minutes to 6 seconds.
- Developed an interactive and engaging user interface using Streamlit, a Python library for creating applications.
- Designed an **RLHF** pipeline enabling self-learning models to generate responses aligned with **human preferences**.

### Diffusion Models for Gravitational Lensing Simulation | Llama, Streamlit, Groq, Langchain — GitHub

Apr. 2024

- Developed a **diffusion model** in PyTorch for gravitational lensing simulation, efficiently handling 1 million iterations of noise for high-accuracy astrophysical modeling.

- Optimized the pipeline with a **UNet architecture**, cutting training time by **30%** and efficiently managing 62 million parameters for faster simulations.
- **Optimized GPU memory usage**, cutting out-of-memory errors by **50%** and enabling smooth model execution on **16 GB VRAM GPU** systems.

**Open Source at Meta's BackendBench Repository** | *Python, PyTorch, CI/CD Workflows* | GitHub **Oct. 2025**

- Introduced error logging in **LLM execution** to capture failures when agents fail to respond (PR#164).
- Enhanced **CI workflow** to ensure `failed_ops.json` is empty for smoke and opinfo tests on the ATen backend (PR#172).
- Refactored backend operation checks to improve consistency in **ATen operator** benchmarking (PR#158).

## Technical Skills

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**Languages:** Python, C, C++, Javascript, Typescript

**Developer Tools:** VS Code, Google Cloud Platform

**Technologies/Frameworks:** Linux, GitHub, Github Actions, Postgres, MongoDB, Redis, Git, Docker, Kubernetes, React.js, Next.js, Pytorch, Langchain, CrewAI, Machine learning, WebAssembly, CUDA, cuDNN, Tensorflow, Langgraph

## Publications

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- Flood Prediction Using Classical and Quantum Machine Learning Models Jul 2024
- Personalized Recommendation Systems using Multimodal, Autonomous, Multi Agent Systems
- BenchRL-QAS: Benchmarking reinforcement learning algorithms for quantum architecture search (Accepted in AAAI 2025 QIML Symposium)

## Conferences

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- RAG-LLM Workflow for Observational Health Research at JuliaCon 2025

## Achievements

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- Winner at Deloitte Quantum Climate Challenge at Dusseldorf, Germany May 2024
- First Project Success at Julia Small Grants Program - Contributions led to a 76 % performance improvement in OrdinaryDiffEq.jl library Aug. 2024
- IBM Quantum Challenge Advanced Badge June 2024
- Finalist at Deloitte Hackspllosion Hackathon - Top 15 among 3000+ teams March 2025

## Leadership / Extracurricular

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### Project X VJTI

**2024 – Present**

*Core Team Member*

*Veermata Jijabai Technological Institute*

- Mentored 8 college **sophomore** in making **research-level** projects in machine learning and deep learning.

### Competitive Programming Club VJTI

**2023 – Present**

*Core Team Member*

*Veermata Jijabai Technological Institute*

- Member of CP Club, a community consisting of 20 **highly dedicated competitive programmers**

### Community of Coders VJTI

**2024 – Present**

*Core Team Member*

*Veermata Jijabai Technological Institute*

- **Machine Learning Head** at Community of Coders Club, VJTI, leading a team of 6-7 members in Machine Learning.