# Arush Singhal

**B.E** in Computer Engineering Thapar Institute of Engineering and Technology

# **J** +91-8447486759 ■ arushsinghal98@gmail.com in linkedin.com/in/arush-singhal/ leetcode.com/u/arushsinghal98 github.com/arushsinghal

#### **SUMMARY**

B.E. Computer Engineering student with strong foundations in AI/ML, Data Science, and DSA. Skilled in Python, C++, and Deep Learning (OpenCV, Transformers). Passionate about building scalable, real-world AI systems. Seeking internship opportunities in Core AI/ML, Data Science or SDE roles.

#### **EDUCATION**

#### Thapar Institute of Engineering and Technology

Bachelor of Engineering in Computer Engineering (CGPA: 7.0)

Patiala, Punjab, India July 2023 - September 2027

Gurgaon, Haryana, India April 2009 – June 2023

# **Amity International School, Sector-46**

Nursery - Class 12 (PCM)

#### SKILLS

- Programming Languages: C++, Python, C, R
- Data Structures and Algorithms: Advanced proficiency (Greedy Algorithm, Graph, Dynamic Programming, Trees etc.)
- AI/ML Frameworks: TensorFlow, OpenCV, Scikit-Learn, Deep Learning, LangChain, Transformers, Pytorch, CNN, XGBoost
- Web Development: Flask, Django, HTML, CSS, API Integration
- **DevOps:** Docker
- Tools and Platforms: Git, GitHub, VSCode, Raspberry Pi, Linux, Raspbian
- Databases: Oracle, MySQL, PostgreSQL, Firebase
- Current Learning Areas: AI Model Optimization, LLMs, Transformers, Vision Transformers, LLM Fine Tuning, MCP
- Core Skills: SDLC, Problem Solving, Communication, Teamwork, Project Management, Analytical Thinking

## **PROJECTS**

#### **Real Estate Investment Tracker**

React, Node.js, Oracle SQL, PL/SQL 😱

- Built a full-stack real estate analytics platform in a 3-member team, featuring React dashboard, REST API backend, and raw SQL/PLSQL-based Oracle DB with a responsive UI with live filtering and investor dashboards supports 50+ user test cases
- Designed a fully normalized schema (3NF) with 6+ entities; enforced referential integrity via PK/FK constraints.
- Implemented 15+ analytics modules including ROI, cash flow, rent overages, and lease expiry using advanced SQL joins and PL/SQL procedures, triggers, cursors.

### RESEARCH WORK & REIMPLEMENTATIONS

## ShakespeareGPT

Transformer from Scratch — PyTorch, NLP, Gradio 🗘

- Built decoder-only Transformer (multi-head attention, layer norm, positional encoding) based on "Attention Is All You Need".
- Trained on Tiny Shakespeare dataset; achieved 18.7 perplexity and 94% input coherence.
- Deployed via Gradio + Streamlit; 250ms latency for real-time prompts.

## **GPT-2** architecture and research Reimplementation

PyTorch, Tokenizer, 124M Parameters ?

- Rebuilt GPT-2 (124M parameters) from scratch using PyTorch with custom tokenizer and domain-tuned dataset.
- Logged perplexity/loss and designed modular, extensible pipeline for reproducibility.

## **Emotion & Colour Research (Ongoing)**

Team of 5 + 2 Professors + 1 Neurologist

- Developing ML model to predict color/music preferences based on emotional state.
- Exploring how ambient color/music shifts influence mood and well-being in real time.

## **EXPERIENCE**

## **Thapar ACM Student Chapter**

Patiala, Punjab, India August 2024 - Present

Tech and Marketing Executive - Core Member

- Led 15+ AI, DSA and Web Dev bootcamps, coordinated amongst the society and various domains, increased student engagement by 40% (700+ attendees).
- Fostered partnerships with industry experts to deliver guest lectures, improving the chapter's outreach and visibility.

# **ACHIEVEMENTS**

- JEE Advanced Qualifier—Top 5% in India
- NCSC National Level Winner
- Patent Pending on Eco Brick—Tested at IIT Delhi for environmental Innovation