Prathamjyot Singh

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Education

Thapar Institute of Engineering and technology **Sep. 2022 – May 2026**
Bachelor of Engineering in Computer Engineering ***CGPA: 8.24*** *Patiala, Punjab*

Experience

Kaggle Expert **Ongoing**
Data Science Contributor *Remote*

- Achieved Kaggle Expert status in Datasets, Notebooks, and Discussions. Demonstrated advanced data science expertise through high-quality contributions and engagement.
- Ranks on 22 Feb 2025
  - Ranked under 800 out of 60K+ in Kaggle Notebooks.
  - Ranked under 800 out of 28K+ in Kaggle Discussions.
  - Ranked under 400 out of 15K+ in Kaggle Datasets.
- Consistently contributed high-quality datasets and notebooks while actively engaging in discussions and collaborative learning, showcasing strong problem-solving skills and effective communication of insights.

Researcher **Jan 2025**
ISMS 2024-25 — 7th International Conference on Information Systems and Management Science *Remote*

- Authored the research paper *"Early Detection of Forest Fire Using Fine-tuned MobileNetV2: A Lightweight Deep Learning Approach"*, which was accepted and presented at ISMS 2024-25 on Feb 22-23, 2025.
- Developed a deep learning model utilizing MobileNetV2 to improve early forest fire detection with lightweight computational efficiency.
- The paper will be published in SCOPUS-indexed Springer LNNS proceedings.

Researcher **Jul 2024**
IC3 2025 — 17th International Conference on Contemporary Computing *Remote*

- Co-authored the paper *"AI-Driven Legal Summarization: A Hybrid Framework Integrating Automatic Speech Recognition, Diarization, and BART for Courtroom Proceedings"*, accepted for presentation at IC3 2025.
- Designed an end-to-end pipeline integrating ASR, speaker diarization, and transformer-based summarization to automate legal documentation.
- The paper accepted among the top 35% submissions.
- It will be published in the SCOPUS-indexed IEEE Xplore digital library.

Projects

RecruitMate - Competitive Coding Platform | *Flask, Firebase, HTML, CSS, JavaScript* **Sept 2024 - Dec 2024**

- Developed a full-stack web application to host coding competitions where participants can create and join teams.
- Used Firebase Authentication to handle secure user logins and role-based access control for different users.
- Implemented real-time team collaboration features, including live chat for team members using Firebase Firestore.
- Integrated automated email notifications for actions such as team invites, join requests, acceptances, and deletions.
- Designed an interactive dashboard to manage contests, teams, and participants with a user-friendly UI.

LLM-Based Research Paper Summarizer | *GEMMA, LoRA, Quantization, PyTorch, Streamlit* **Feb 2025**

- Developed an LLM-powered research paper summarization system using Google's GEMMA model finetuned with LoRA.
- Implemented LoRA-based fine-tuning to enhance model efficiency while reducing computational costs.
- Applied 4-bit and 8-bit quantization via BitsAndBytes (bnb) to optimize memory usage while maintaining performance.
- Integrated PyMuPDF (fitz) for accurate text extraction from research papers in PDF format.
- Leveraged Transformer-based AutoModelForCausalLM for context-aware summarization of academic papers.
- Designed and deployed a user-friendly Streamlit UI for real-time AI-powered research paper summarization.

Brain Tumor Segmentation using Hybrid Deep Learning | *Python, TensorFlow, Transformers, CBAM* **Ongoing**

- Developed a hybrid deep learning model integrating Transformer blocks and CBAM attention mechanism for brain tumor segmentation.
- Utilized the BraTS dataset to train and evaluate the model, achieving over 99% accuracy in tumor classification.
- Implemented CNN and attention-based architectures to enhance segmentation precision and robustness.

- Preprocessed MRI images using normalization and augmentation techniques to improve model generalization.
- Currently authoring a research paper to present findings on hybrid architectures for medical image segmentation.

AI-Powered Courtroom Monitoring and Summarization System | *NLP, Transformers, ASR, Diarization* **Ongoing**

- Designed and implemented a hybrid AI framework for real-time courtroom monitoring using Automatic Speech Recognition (ASR), speaker diarization, and transformer-based summarization models.
- Leveraged the AssemblyAI API for diarization to distinguish individual speakers and transcribe courtroom audio into structured text.
- Utilized Facebook's BART model to generate domain-specific, context-aware summaries from legal transcripts.
- Streamlined legal analysis by automating the generation of concise summaries from spoken proceedings, enabling improved transparency, accessibility, and archival of judicial discourse.

Technical Skills

Languages: Python, TensorFlow, PyTorch, C++, C, HTML/CSS, JavaScript, SQL
Developer Tools: Kaggle, Ollama, LangChain, RAG (Retrieval-Augmented Generation), Hugging Face Transformers, Msty, VS Code, Jupyter Notebook, Google Cloud Platform, Firebase, MATLAB
Technologies/Frameworks: Large Language Models (LLMs), Generative AI, Machine Learning and Deep Learning, Natural Language Processing (NLP), Web Development, Data Structures and Algorithms

Co-curricular

- Presented the research paper *"Early Detection of Forest Fire Using Fine-tuned MobileNetV2: A Lightweight Deep Learning Approach"* at the 7th International Conference on Information Systems and Management Science (ISMS), organized by the Department of Computer Engineering, National Institute of Technology Kurukshetra, held in Hybrid Mode on February 22-23, 2025.
- Presented and published an abstract of the research paper *"A Review of Multimodal Large Language Models in Healthcare"* at the 28th PSC National Conference on Current Trends in Science and Technology, Khalsa College Amritsar (Feb 8, 2025), receiving recognition for research contributions.
- Completed a six-week training program on Machine Learning and Deep Learning at Thapar Institute of Engineering and Technology (June 5 - July 14, 2023).
- Participated in a two-month Machine Learning program organized by 1Stop and Wissenaire, IIT Bhubaneswar (Feb 1 - March 31, 2024).
- Earned certificates of participation for outstanding performance in various hackathons, including:
  - MAKEATHON5, a 24-hour hybrid hackathon hosted by Microsoft Learn Student Chapter, TIET (Feb 25-26, 2023).
  - A 36-hour hackathon organized by the OWASP Thapar Student Chapter at TIET (April 14-16, 2023).