SUSHOVAN PAN

MSc in Computer Science | BSc in Computer Science

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PROJECTS

- **VoiceChain: Secure Automated IVR with Emotion recognition, LLM Integration and Text-based Call Record Storage :**
  - **Project Overview:** Developing an automated IVR system that interacts with callers using natural language processing and stores call records on Text files.
  - **Technologies Used:** Asterisk, Speech-to-Text, Large Language Models (LLMs), Text-to-Speech, BERT.
  - **Key Features:**
    - **Automated IVR:** Designing an IVR system capable of handling and processing caller queries using LLMs based on PDF content.
    - **Speech-to-Text and Text-to-Speech:** Implementing audio transcription and response generation to provide a seamless interaction experience.
    - **Emotion Detection:** Integrating emotional tone detection to ensure accurate responses for users.
    - **On-Device LLM Response Generation:** Implemented secure, high-quality response generation using Ollama and Llama 3, ensuring data privacy and minimizing dependency on external APIs. [Project Link]
- **Rare Bird Species Classification Using Audio Data and Machine Learning:**
  - **Project Overview:** Developed a system for classifying bird species from audio recordings using advanced machine learning techniques.
  - **Technologies Used:** React, Flask, Python, Machine Learning (ML).
  - **Key Features:**
    - **Audio Classification:** Utilized various classifiers (e.g., Random Forest, SVM, MLP) for accurate species prediction.
    - **Web Application:** Created a React-based front end for audio file uploads and result display.
    - **Model Integration:** Deployed a Flask server to handle predictions and serve bird information.
    - **Bird Information:** Integrated detailed bird descriptions and images from a local JSON file. [Project Link]
- **PDF Chatbot Application for Conversational PDF Analysis:**
  - **Overview:** Developed a web application that allows users to interactively query PDF content and receive responses with source references.
  - **Technologies:** React, Flask, Python, LangChain, FAISS, MySQL.
  - **Key Features:**
    - **Conversational Interface:** Chatbot processes queries and provides source-referenced answers.
    - **PDF Analysis:** Used LangChain's FAISS vector store for efficient text retrieval.
    - **Machine Learning:** Leveraged `CTransformers` with a fine-tuned LLaMA-2 model for NLP.
    - **Database:** Implemented a MySQL schema for managing chat history.
    - **File Upload:** Developed a robust Flask-based feature for managing PDF uploads.
    - **Frontend-Backend Integration:** Integrated React frontend with Flask backend using RESTful APIs.
    - **History Summarization:** Added functionality to summarize past interactions.

EDUCATION

MSc in Computer Science
Ramakrishna Mission Vivekananda Educational and Research Institute
Aug 2023 – July 2025 | Belur, India

Current CGPA: 6.00/10

BSc in Computer Science
Parasanta Chandra Mahalanobis Mahavidyalaya
Aug 2020 – Aug 2023 | Kolkata, India

CGPA: 9.96/10

Higher Secondary (10+2)
Garalgacha High School
2020 | Garalgacha, India

Percentage: 80.2%

Secondary (10)
Garalgacha High School
2018 | Garalgacha, India

Percentage: 75.6%

GRADUATE COURSEWORK

- Design and Analysis of Algorithms
- Concepts of Programming Languages
- Discrete Mathematics
- Linear Algebra
- Probability and Stochastic Processes
- Theory of Computation
- Graph Theory
- Approximation and Online Algorithms
- Machine Learning
- Mathematical Logic

TECHNICAL SKILLS

- Languages: C, C++, Java, Python
- Frontend: HTML, CSS, JavaScript, React
- Database: MySQL
- Frameworks: Flask, Streamlit
- Platforms: Windows, Linux

INTERESTS

- Artificial Intelligence and Machine Learning
- Full Stack Development
- Open Source Software Development

LANGUAGES

English | Hindi | Bengali