SUBHADEEP JANA

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EDUCATION

Master of Science in Computer Science Aug 2022 - May 2024
Indiana University Bloomington *GPA: 3.87/4.0*

- Coursework: Software Engineering, Applied Algorithms, Applied Machine Learning, Time Series Analysis

Bachelor of Technology in Computer Science Aug 2017 - Jul 2021
Government College of Engineering and Ceramic Technology *CGPA: 9.07/10.0*

- Coursework: Data Structures, Software Development, Artificial Intelligence, Database Management Systems

EXPERIENCE

Research Assistant Jan 2024 - Present
Indiana University *Bloomington*

- Architected a web-based cognitive experiment using JavaScript and jsPysch to study *imminence* and *recency* perception in humans, analyzing the correlation between the two cognitive processes.
- Deployed the experiment on a Linux server using psiTurk and leveraged Amazon MTurk for data collection. Utilized a custom PHP script and jQuery to store 1000+ experiment results on the server.
- Improved accuracies by 35% by integrating a balanced probe distribution in the experiment, modifying key timeline parameters like inter-probe duration, and generating real-time accuracy feedbacks at regular intervals.

Software Engineer Intern Jan 2021 - June 2021
IXXO Lambda Vision *France (Remote)*

- Developed a Flask-based dashboard to detect key physical features of a car through *computer vision*, *image processing*, and *region-of-interest localization*. Collaborated in a cross-functional Agile team of 5 for feature integrations.
- Trained a YOLOv3 *object detection* model using TensorFlow and labeled 8000 images using Visual Object Tagging Tool (VoTT) to enhance detection accuracy. Conducted unit and integration testing using Pytest achieving 75% code coverage.
- Enhanced car color detection accuracy to 85%; leveraging histogram equalization, contour detection, color clustering, and color mapping from OpenCV, scikit-image, and Pillow.

SKILLS

Languages	Python, Java, C++, JavaScript, HTML, CSS, SQL, Bash
Frameworks	Flask, ReactJS, OpenCV, Keras, TensorFlow, scikit-learn, Pytest, PyMongo, jsPsych, psiTurk
Databases	MySQL, PostgreSQL, MongoDB, Pinecone
Tools	Git, Jira, VS Code, Jupyter Notebook, Postman, PowerBI, Docker, Adobe Creative Cloud
Platforms	AWS (EC2, S3, Lambda, DynamoDB), Windows, Linux

PROJECTS

Music Genre Classification using Machine Learning Paper

- Evaluated 10+ machine learning models for genre classification, including tree-based, probabilistic models in scikit-learn, and neural network models in TensorFlow. Achieved 90% test accuracy with hybrid CNN-RNN architectures using LSTM.
- Extracted 48 spectral features and mel-spectrograms from audio data using NumPy, Librosa, and OpenCV for model training.

Task Management App with RAG Chatbot GitHub

- Constructed a ReactJS, Express.js, and Node.js full-stack web application for task management with a PostgreSQL backend for querying data. Integrated a *retrieval-augmented generation* (RAG) chatbot to assist users with task-related queries.
- Utilized Mistral-7B LLM with HuggingFace Embeddings, Pinecone, and FAISS indexing to enhance document search.

MuSE: Music from Scene Extraction Article

- Developed a Streamlit-based web application for generating background music for any short-form video. Implemented video frame extraction with OpenCV, scene analysis using PlacesCNN, and audio generation using MusicGen model.
- Devised a clustering logic to generate structured prompts from scenes detected by PlacesCNN for audio synthesis.

CERTIFICATIONS & ACHIEVEMENTS

- AWS Solution Architect Associate *(SAA-C03)* — Badge
- Awarded *$1500* for securing *2nd* position in IU's CRNY data visualization competition — Article
- *Comparative Study of OpenCV Inpainting Algorithms*, GJCST: Interdisciplinary, Volume 21, Issue 2 — Paper