ROHAN BISWAS

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github.com/RohanBiswas67/ 🌐 rohan-biswas-portfolio.vercel.app

Top Skills

Quantum Information and Computing, Machine Learning, Audio Signal Processing, Natural Language Processing

Education

Tezpur University   **November 2021 – June 2025 (Expected)**

Bachelor of Technology(B.Tech) in Computer science and Engineering   *Tezpur-784028, Assam, India*

Projects

Portfolio Site

Astro JS, Node JS, ReactJS, Tailwind CSS, Three JS   **[January 2025]**

- Developed a personal portfolio website to showcase projects and research interests.
- Implemented interactive 3D visualizations using Three.js to enhance user engagement.
- Integrated a responsive design with Tailwind CSS for optimal viewing across various devices.
- Deployed the site using Vercel for reliable hosting and performance.
- The live portfolio can be viewed at: rohan-biswas-portfolio.vercel.app

Speech Segmentation, Word Discovery, & Automatic Phonetization of Indian Native Languages

NLP, Speech Processing, XAI   **[December 2024]**

- Developed a system for speech segmentation, word discovery, and phoneme recognition tailored to native Indian languages, addressing linguistic diversity and under-representation in technology.
- Utilized Explainable Non-Negative Matrix Factorization (XNMF) for enhanced segmentation accuracy to about 85-90 percent
- Demonstrated expertise in preprocessing techniques (noise reduction, spectrogram generation), feature extraction (MFCC, spectral analysis), and segmentation methods (ZCR, STE, and Dynamic Time Warping).
- The project therefore contributes to multilingual NLP tools, language preservation, and cultural empowerment.
- The link to the github repository of the project : github.com/RohanBiswas67/Segmentation

Speech-Based Disease Predictor

ASR, NLP, Transformers, Pandas   **[September 2024]**

- Utilized the *SpeechRecognition* library to convert user speech into text for symptom extraction.
- Implemented *BERT tokenizer* from Hugging Face Transformers and regular expressions to accurately tokenize and match symptoms from the speech input.
- Built a disease prediction model that compares extracted symptoms against a custom dataset of diseases using *Pandas*, ranking potential matches based on symptom overlap.
- Provided users with recommendations for further tests or medical consultation if multiple diseases were detected.
- Accuracy of about 75 percent achieved with the symptom dataset used here.
- The link to the github repository of the project : github.com/RohanBiswas67/Speech-Based-Disease-Identification

Image Denoiser

Python, Flask, OpenCV   **[September 2023]**

- Developed a web application using Python, Flask, and OpenCV to enhance image quality by reducing noise and imperfections with about 65-70 percent accuracy.
- Utilized the Flask framework to create a user-friendly web platform for image processing.
- Implemented OpenCV, an open-source computer vision library, to apply noise reduction techniques to uploaded images.
- Provided users with accessible tools to improve the quality of their images by reducing noise and imperfections.
- The link to the github repository of the project : github.com/RohanBiswas67/Image-Denoiser

Technical Skills

Languages: Python, C/C++, JavaScript, MATLAB , PHP, x86_64
Database Management Systems: MySQL, PostgresQL, MongoDB, Apache Cassandra
Technologies/Frameworks:

- **Web development**: ReactJS, ExpressJS, NodeJS, Django, Flask, Astro.js
- **Machine Learning/ Deep Learning**: Scikit-Learn, Tensorflow with Keras, PyTorch, OpenCV, Transformers, NLTK
- **Others**: Git/GitHub, IBM Qiskit

Experiences

IASc FAST-SF Summer Research Intern   **June 2024 – July 2024**

Department of Electrical Communication Engineering, Indian Institude of Sciences   *Bangalore-560012, Karnataka, India*

- Learned about Quantum Noise, that degrades the information being transmitted across a channel leading to errors, and Quantum Error Correcting codes which help retrieve the original information from the noisy signal.
- Implemented the [5,1,3] quantum error correcting code - with methods involving that mentioned in literature.
- implemented the [5,1,3] quantum error correcting code - with codeword stabilized codes involving non-linear graph state.

Licenses / Certifications

Qiskit Global Summer School 2023   **June 2023- August 2023**

Quantum Excellence   *IBM Quantum*

- Achieved Quantum Excellence by solving 100& of the lab tasks on time .
- Learned about several topics in Quantum Computation and Quantum Information sciences including Quantum Algorithms.
- Learned how to apply those principles into various other use cases like finding factor of number , solev engineering problems, and other related things.