Srabonti Deb

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Education

Rajshahi University of Engineering & Technology (RUET)   **Rajshahi, Bangladesh**

Bachelor of Science in Computer Science & Engineering (CGPA: 3.43 / 4.00) | First Class.   *2019-2024*

- **Thesis Topic:** Advancing Deepfake detection: Integrating Time Series Processing with Vision Transformer.
  Thesis Supervisor: Tasmia Jannat
- **Relevant Coursework**: Linear Algebra, Differential and Integral Calculus, Data Structures and Algorithms, Object Oriented Programming, Database Management, Applied Statistics & Queuing Theory, Digital Image Processing, Neural Network and Fuzzy System, Artificial Intelligence, Data Mining.

Experiences

Young Learners' Research Lab   **Rajshahi, Bangladesh**

Research Assistant   *Jun 2024 – Present*

Contributed to projects aimed at improving deep learning models. Key projects include:

Explainable Retrieval-Augmented Generation (RAG) (Link)

- Contributed to the development of RAG system for low-resource and noisy text environments.
- Utilized BM25 (lexical keyword matching) and Contriever (dense semantic retrieval) model for retrieving relevant answers.
- Integrated these retrieval pipelines with generator models such as Flan-T5 and Llama-3 Instruct.

Gastrointestinal Disease Classification (Link)

- Developed GAN-based augmentation strategies to address class imbalance in gastrointestinal disease datasets.
- Utilized preprocessing techniques including CLAHE, Gaussian smoothing, MSRCR, and bilateral filtering to suppress compression artifacts.
- Implemented stratified k-fold validation for performance assessment.
- Trained and compared multiple architectures (ConvMixer, ConvNext-Tiny, Swin Transformer) for disease classification.

Deepfake Video Detection using InceptionNet (Link)

- Developed 3D InceptionNet framework for multi-class deepfake detection across six categories on FaceForensics++ benchmark.
- Implemented three-phase conditional training strategy using transfer learning to address class imbalance, significantly improving minority class performance.
- Evaluated robustness across five manipulation techniques with comprehensive confusion matrix analysis.

Syncrosis Lab   **Dhaka, Bangladesh**

Junior UI Developer   *Sep 2023 – Dec 2023*

- Developed frontend components and features of web solutions using TypeScript, React & Tailwind CSS.
- Contributed to two major client projects: Inventory Management System (an e-commerce platform) & Trip-Portal (a travel agency website).

Code Studio   **Rajshahi, Bangladesh**
UI/UX Designer   *July 2020 – Dec 2020*

- Designed the user interface elements including layout, typography, colors, and icons using Adobe XD & Figma.
- Improved the usability, accessibility, and overall interaction experience of the product.

Publications

- Srabonti Deb, Tasmia Jannat, Mohiuddin Ahmed, "Advancing Deepfake Detection: Integrating Time Series Processing with Vision Transformers", Published at the 27th International Conference on Computer & Information Technology (ICCIT-2024), IEEE Bangladesh, December 2024. (DOI:10.1109/ICCIT64611.2024.11022577)
- Shanjid Hasan Nishat, Srabonti Deb, Mohiuddin Ahmed, "Enhancing Fitness Movement Recognition with Attention Mechanism and Pre-Trained Feature Extractors" (Under review).

Projects

Multi-Pdf-Chatbot | *Python, Langchain, Streamlit, Hugging Face Hub, PyPDF2* (Link)

- Built an intelligent chatbot capable of answering questions across multiple uploaded PDFs using open-source NLP models.
- Utilized Sentence-Transformers (all-MiniLM-L6-v2) and LangChain with FAISS for semantic text retrieval and similarity search.
- Integrated Hugging Face LLM (Llama-3.1-8B-Instruct) with ConversationBufferMemory to enable context-aware, multi-turn question answering.
- Developed an interactive Streamlit interface for real-time, conversational exploration of uploaded PDF documents.

E-commerce Website | *HTML, CSS, Bootstrap, JavaScript, PHP, MySQL* (Link)

- Solved key challenges including ensuring responsive design across devices› and enhancing user experience with features like autocomplete search and product previews.
- Implemented security measures by utilizing hashing methods and integrated payment gateways securely.
- Successfully improved performance and scalability by optimizing database using indexes.

Save-Me-Security-App | *Java, Android SDK* (Link)

- Developed a user database system that captures user details including names and five trusted contact numbers.
- Implemented an emergency feature that allows users to send their GPS location and request assistance with a single button press.

Skills

Programming Languages: Python, C, C++, Java, MATLAB, HTML/CSS, JavaScript, MySQL, PHP.

Libraries/Frameworks: TensorFlow, PyTorch, Hugging Face Transformers, Keras, Scikit-Learn, Pandas, NumPy, Matplotlib, Seaborn, OpenCV, Arduino SDK, Bootstrap.

Tools & Applications: Git, GitHub, Jupyter Notebook, XAMPP, Overleaf, Adobe Illustrator, Canva, Cisco Packet Tracer, Logisim.

Leadership Experiences

Class Representative, CSE (Session 18-19) RUET: Managed class schedules, facilitated communication between students and faculty, and coordinated departmental activities.

Awards

National Higher Secondary Scholarship: Received full tuition fee scholarship and stipend during undergraduate studies.

National Secondary School Scholarship: Received full tuition fee scholarship and stipend during higher secondary studies.

Language

Bengali (Native), English (Fluent)

IELTS: Overall Band Score 7.0 (Listening: 7.0, Reading: 7.5, Writing: 6.5, Speaking: 7.0)

References

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