Ritabrata Chakraborty

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SUMMARY

Junior undergraduate pursuing a Bachelor's in Computer Science, with ample experience in Computer Vision and Natural Language Processing research, delivering reliable end-to-end code.

EDUCATION

Manipal University Jaipur **BTech in Computer Science** | GPA : **9.27/10** *2022-Present*
Coursework: Data Structures, Algorithms, Object Oriented Programming, Digital Image Processing,Computer Vision, Discrete Math

TECHNICAL SKILLS AND INTERESTS

Languages : Python, C/C++, Java, MySQL, JavaScript, JSON, CSS
Frameworks :Pytorch, Tensorflow, Tensorflow Extended (TFX), Keras, scikit-learn, OpenCV, RAGChain
DevOps and API Tools : Github,Weights and Biases, Tensorboard, Git,ONNX, Pytorch Lightning, Docker, Jenkins
Organizations : Founder @ Vision Language Research (VLR) MUJ, Projects and Research Head @ ACM SIGAI MUJ

EXPERIENCE

Research Fellow | *International Institute of Information Technology, Hyderabad* *May 2024 - July 2024*
  – Supervisor: **Dr. C. V. Jawahar**, Dr. Ajoy Mondal
  – While researching Scene Text Recognition (STR) with a focus on qualitative research gaps for Indic languages, identified inefficiencies in **data processing**.
  – Developed a batch-wise **data augmentation** pipeline, resulting in a **200%** reduction in **pre-processing time** for images.

Research Intern | *Purdue University* *Jan 2024 - May 2024*
  – Supervisor: **Prof. Vaneet Aggarwal**
  – Collaborated closely with PhD students to execute primary experiments for validating and refining the RL model.
  – Incorporated **explainability** into the model, improving human trust to over 30 doctors (**50%** improvement).

Research Intern | *Indian Statistical Institute Kolkata* *December 2023 - May 2024*
  – Supervisor: **Prof. Umapada Pal**
  – Developed an inference pipeline for the Segment-Anything-Model (SAM) to process remote sensing images, achieving a **30%** improvement in processing efficiency.
  – Enhanced SAM's performance through text prompting and **few-shot tuning**, resulting in a Dice score of **0.70** for guided segmentation tasks.

PROJECTS

TILOTTAMA: A Computer Vision Driven Solution for Menstrual Waste Management [Github] [Docs] *Sep 2024-Sep 2024*
  – Created a menstrual waste assortment system for industry and household use with fine-tuned YOLO models and ViT-CNN, achieving **90%+** accuracy in menstrual waste detection.
  – Ranked**15th/400** in MUJ HACKX Hackathon 2024, with special mention for the social cause.

MODELSLEUTH: Automated Model Analysis in Codebases [Github] [PyPI] *Sep 2024-Sep 2024*
  – Developed the **ModelSleuth** CLI tool, reducing model search time by **30%**, accelerating pipelines for code solutions.
  – Improved model traceability by **25%**, with instant model summaries,with support for both **Pytorch** and **Tensorflow**.

SIBYL: Strategic Intelligence for Career Navigation[Github] [Demo] *Nov 2023-Jan 2024*
  – Engineered an employee career path application using ensemble models (Random Forest, SVM, XGBoost), achieving **92%** accuracy in skill gap analysis. Projected to improve upskilling rate by **20-30%**.
  – Secured **4th place** out of 25 teams at the **Dell Hack2Hire** Hackathon, recognized for innovation and practical application.

PATENTS

MANN-MITRA: A Depression Detection System Using Machine Learning [Link] *July 2023-October 2023*
  – Designed a **multi-modal** system utilizing ensemble ML models for real-time detection of depression symptoms.
  – Successfully published the research in the **National Journal of Patents** on **13th October 2023**.

NAVYA: Navigational Audio for Visual Yield Assistance [Link] *May 2024-July 2024*
  – Realtime Visual-to-Audio description translation, improving power efficiency in practical usage by **20%** as compared to other transformer-based methods.
  – Succesfully published in **National Journal of Patents** on **30th August 2024**.

HONORS AND AWARDS

Summer Research Fellowship Program 2024 | *IAS-NASI-INSA* | *Awarded to exclusively* **200** *students nationwide* *May 2024*
Student Excellence Award (x5) | *Manipal University Jaipur* | *Recognizing* **extracurricular efforts** *June 2024*
Dean's List (x3) | *Manipal University Jaipur* | *Awarded* **Highest GPA** *November 2023*