Monjoy Narayan Choudhury

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Education

International Institute of Information Technology Bangalore (IIITB) **November 2020 – July 2025**
BTech+MTech (Dual Degree) in Computer Science *CGPA: 3.89/4.00*

Specialisation: *Artificial Intelligence and Machine Learning (AIML)*

Experience

ETH Language Reasoning and Education Lab **January 2025 – June 2025**
Master's Project Intern | Mentors: Yifan Hou, Prof. Mrinmaya Sachan *Zürich, Switzerland (Remote)*

- Currently working on evaluating Large Vision Language Models in solving visual reasoning tasks using simple mathematical games.

Bosch Research **August 2024 – January 2025**
Research Intern *Bangalore, Karnataka*

- As part of the Computer Vision Corporate Research Division, exploring the application of Vision-Language Models (VLMs) for autonomous driving solutions, focusing on in-context learning, model optimization and output evaluation.
- Developed an LLM-based domain-specific evaluation metric to assess caption quality, tailored for autonomous driving scene description tasks.

Google **May 2024 – July 2024**
Software Engineering Intern *Bangalore, Karnataka*

- Created an end-to-end sampling mechanism for query-set reduction, maintaining coverage for the real-time feature monitoring pipeline in Google Search.
- Implemented and experimented with various metric and graph clustering algorithms, devising greedy sampling heuristics that improved coverage by 57% while achieving a 50% reduction in the query-set enabling search feature teams to enhance pre-production testing coverage, reducing test suite sizes by a significant margin.

Multimodal Perception Lab - IIIT Bangalore **April 2023 – Present**
Research Affiliate | Computer Vision | Mentor: Prof. Dinesh Babu Jayagopi *Bangalore, Karnataka*

- Researched and benchmarked various models on deep fake-based methods on GANs and Variational Auto Encoders for Privacy-Preserving Facial De-identification techniques.
- Constructed a pipeline for privacy-preserving face swap using diffusion models combined with motion transfer for short video clips.

Research Work (*equal contribution)

- *Harne, S*.*, *Choudhury, M.N.**, Rao, M., Srikanth, T.K., Mehrotra, S., Vashisht, A., Basu, A. and Sodhi, M., 2024. **CASE: Curricular Data Pre-training for Building Generative and Discriminative Assistive Psychology Expert Models**. In Findings of the Association for Computational Linguistics: EMNLP 2024, pages 15769–15778, Miami, Florida, USA. Association for Computational Linguistics. [Link]

- Mukherjee, A., Choudhury, M.N. and Jayagopi, D.B., 2024. **RID-TWIN: An end-to-end pipeline for automatic face de-identification in videos.** arXiv preprint arXiv:2403.10058. [Link]

- Praseeda, Choudhury, M.N., Chadha, B.S. and Srinivasa, S., 2023, March. **A Systematic Review of Online Learning Platforms for Computer Science Courses.** In 2023 IEEE World Engineering Education Conference (EDUNINE) (pp. 1-6). IEEE. [Link]

Personal Projects

Differential Diffusion in HunyuanDiT | Huggingface Diffusers **July 2024 - August 2024**

- Added Differential Diffusion support to HunyuanDiT as a contribution to HuggingFace Diffusers as part of their community pipelines.

AiDA: Human-like Virtual Shopping Assistant | *LangChain, llama-cpp, NeRF, python* **June 2024 - July 2024**

- Constructed an end-to-end realistic avatar pipeline service that takes in user prompts via speech and returns a conversational visual and speech chat agent to enhance shopping in e-commerce platforms.

- Engineered Prompts to obtain better recommendations using a Retrieval Augmentation Generation Pipeline with Llama2.
- Used state-of-the-art Neural Radiance Fields (NeRFs) to create lifelike avatars integrated with a flutter app to create a realistic visual chat assistant.

MedGPT | *GPT2, Reinforcement Learning from Human Feedback* **March 2024 - May 2024**

- Constructed an RLHF pipeline by using Proximal Policy Optimisation Algorithm (PPO) for GPT2 to create medical expert LLM.
- Proposed AI as an evaluator for evaluating model performance by prompt engineering Gemini 1.0 to act as an evaluator.
- Improved preference percentage from 54.60 to 57.03% and BART-Score by 5.4% by optimising generation conditions.

Vision-aided Deep Q-Networks for Cartpole | *Reinforcement Learning* **February 2024 - March 2024**

- Obtained an average reward baseline of 50 using vanilla FCN-based DQN with off-policy implementation with soft updates.
- Performed ablations studies on discount factor, replay buffer size, batch size, and sampling leading to a 4x gain on average reward obtained.
- Extended the architecture to leverage images of the current scene only as state information based on the Deep RL work on Atari and obtained an increase of 20% from baseline.

Multimodal Image Captioning from scratch | *Vision and Language* **May 2023 - June 2023**

- Implemented a ResNet50 backbone CNN-LSTM network to perform image captioning on the Flicker8K dataset with an initial BLEU4 score of **0.527**.
- Enhanced the baseline performance by implementing Bahdanau Attention and GloVe embeddings to **improve the score to 0.535**.

Achievements

- **Dean's Merit Scholarship:** Awarded to top performers in class and was provided a scholarship for all 8 semesters from 2020-2025.
- **Amazon HackOn Season 4**: All India Runners up in over 34,000 participants and 10,000 teams.
- 99.28 percentile in JEE Main (2020) examination among 1.1 million students

Teaching Experience

Visual Recognition, IIIT Bangalore, Spring 2025.

Data Visualization, IIIT Bangalore, Fall 2024.

3DVSS Summer School, IIIT Bangalore, Summer 2024.

Visual Recognition, IIIT Bangalore, Spring 2024.

Programming in Python, IIIT Bangalore, Fall 2023.

Real Analysis, IIIT Bangalore, Spring 2022.

Digital Design, IIIT Bangalore, Fall 2021.

The duties as a Teaching Assistant involved taking tutorials, additional lectures, setting up assignments, and conducting evaluations.

Volunteering

Volunteer for CODS-COMAD 2023.

Organizer for 2022 TEDxIIITBangalore edition titled 'Winds of Change'.

Member of Alumni Relations Committee at IIIT Bangalore from 2022-2023.