Rajarshi Roy

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Recommendations Portfolio

Education

Kalyani Government Engineering College **Aug. 2021 – Jul. 2025**
B.Tech in Computer Science and Engineering *8.8 CGPA*

Experience

AI Engineer Intern **Apr 2025 – May 2025**
Qest *Bengaluru, India (On-site)*

- Designed and developed a **3-stage LLM-powered onboarding agent**, leveraging `Google Maps place_id` to analyze business metadata, assess eligibility through supported categories, and dynamically generate personalized platform components. (eg. Menus and Buttons)
- Implemented **session persistence** to enable seamless resumption of partially completed onboarding flows.
- Contributed to the early-stage development of a **FastAPI**-powered backend, leveraging **LangChain**, **LangSmith**, and **MongoDB MCP** to retrieve structured business data and support intelligent downstream **LLM workflows**.

AI Research Intern **May 2024 – Present**
Artificial Intelligence Institute of South Carolina *Kolkata, India (Remote)*

- Appointed as **Defactify-4.0** Workshop **Web Chair** at **AAAI'25**, helping organize shared tasks on **Codalab** and supporting participants.
- Provided **strategic guidance and expert support** to participants, enhancing their experience and ensuring the **successful execution** of shared tasks throughout the competition.
- Co-authored **DPO-Kernels** (ACL Findings 2025), integrating diverse kernel functions and hybrid loss functions to advance preference optimization.
- Contributed to **DETONATE** (under review), a large-scale benchmark for alignment evaluation across social axes, and proposed metrics to quantify latent space separability.

Publications and Ongoing Research

ByDeWay (CVAM Workshop @ ICCV, Accepted) June 2025

- Proposed a training-free framework using **Layered-Depth-based Prompting (LDP)** to enhance spatial reasoning in Multimodal LLMs.
- Improved **F1-score by up to 10%** on hallucination-sensitive and reasoning tasks (POPE, GQA) across GPT-4o, Qwen2.5-VL, ViLT, and BLIP.

DPO-Kernels (ACL Findings, Accepted) **June 2025**

- Enhanced the **DPO framework** by integrating diverse kernel representations (polynomial, RBF, Mahalanobis, spectral) and embedding-based hybrid loss functions.
- Proposed a **data-driven kernel-divergence selection mechanism** and evaluated it across **12 datasets**, achieving state-of-the-art performance in **factuality, safety, reasoning**, and **instruction following**.

Achievements

Winner of Smart India Hackathon 2022 **Aug 2022**

- Competed in the **Smart India Hackathon 2022** grand finale as part of **Team BRAINCELLS**, **conceptualizing** and **delivering a solution** in 36 hours to address educational challenges during COVID-19.
- Developed and **launched a crowd-volunteering app with a gamified leaderboard**, **promoting volunteering and teaching** through the distribution of **social credits** via mobile and web platforms.