Adrino Rosario James

Undergraduate Student | Researcher in Computer Vision and NLP | Exploring Alignment and Interpretability
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Personal Profile

Undergraduate student working at the intersection of computer vision and Natural Language Processing. Background spans parameter-efficient CNN design and large-scale classification pipelines (5M+ astronomical observations), now extending into vision research and LLM fine-tuning: preference optimization (DPO/PPO), reward modeling, and red-teaming evaluation across open-weight model families. Currently a research intern developing vision-model methods for plant disease detection.

Education

CHRIST (Deemed to be University), Bangalore Jun 2024 – May 2028 (expected)
Bachelor of Computer Applications (Honours with Research) *CGPA: 3.86 / 4.0 (5 semesters)*
Relevant coursework: Data Structures & Algorithms, Design & Analysis of Algorithms, Discrete Mathematics, Graph Theory, Probability & Statistics, Artificial Intelligence, Artificial Intelligence & Human–Machine Interaction, Natural Language Processing, Cloud Computing, Data Analysis using R.

St. Claret Pre-University College, Bangalore Jun 2022 – Mar 2024
Pre-University Course (Classes XI–XII), EBA with Computer Science

Anthony Claret School, Bangalore Jun 2011 – Jun 2022
Indian Certificate of Secondary Education (ICSE): Economics/Commercial Studies, Computer Applications

Scholarships and Honours

Academic Merit Scholarship AY 2025–26
Awarded by CHRIST (Deemed to be University) for academic performance.

Extracurricular Merit Scholarship (Theatre) AY 2025–26
Awarded by CHRIST (Deemed to be University) for contribution to theatre.

Publications and Manuscripts

[1] *Length Heuristics Beat Every Scorer: Auditing Automatic Preference Pairs for Contractual Interpretation.* Accepted at the International Conference on Artificial Intelligence and Emerging Technologies (ICAIET 2027), School of Computer Science & Engineering, XIM University, Bhubaneswar, India. To be presented January 2027.
Audits 984 automatically constructed preference pairs grounded in the CUAD and COLD legal corpora. A length-only baseline (63.0%) outperforms all five content-reading scorers evaluated (53.2–60.0%), indicating that automatic preference construction for legal reasoning can encode surface heuristics rather than interpretive quality.

[2] Manuscript on deep-learning-based disease detection in *Hevea brasiliensis* (rubber). In preparation for conference submission, 2026.

Research Experience

Centre for Artificial Intelligence, CHRIST (Deemed to be University) May 2026 – Present
Research Intern *Bangalore*

- Completed a study on disease detection in *Hevea brasiliensis* (rubber) using deep vision models; manuscript [2] in preparation for conference submission.
- Conducting a follow-up study benchmarking Vision Transformers against CNNs on the same disease-detection task, analysing the architecture–data trade-off for agricultural imaging.

Teaching Experience

Centre for Artificial Intelligence, CHRIST (Deemed to be University) Sept 2026 – Present
Co-Trainer *Bangalore*

- Deep Learning and AI Model Training with NVIDIA GPUs.
- Deep Learning Inferencing using Hugging Face and NVIDIA Build.

- Faculty and Administration Upskilling with AI.

Research Projects

JDAR: Judicial Deliberation Alignment via Reward
- Developing a process reward model for legal reasoning on LLaMA-3-8B-Instruct, using LoRA/QLoRA fine-tuning, Direct Preference Optimisation (DPO), and a verifier-style step scorer.
- The audit of the project's automatically generated preference data forms the basis of paper [1].

Undiagnosed: Multi-Agent Clinical Document Analysis In progress
- Designing a multi-agent pipeline over Google's Gemma / MedGemma models that parses medical documents (laboratory reports, radiology, clinical notes, images) into structured clinical data and reasons over cross-signal cardiac and clinical patterns.
- Built the parser agent (per-page routing of text versus scanned PDFs, multimodal prompting, 4-bit QLoRA inference, JSON-schema validation and repair) and an analyser agent with a low-confidence critique pass that re-checks outputs against the source profile to detect hallucinated signals.

Efficient Deep Learning for CIFAR-100
- Designed hybrid CNN architectures in PyTorch combining residual connections, dense blocks, bottleneck layers, and depthwise separable convolutions, reducing parameters by 30–50% relative to ResNet-18 while maintaining competitive top-1 accuracy.
- Mapped the accuracy–efficiency Pareto boundary across variants and identified a layer-depth configuration at which generalisation degrades sharply on 32×32 inputs, yielding a reproducible depth heuristic for compact model design.

Transfer Learning versus Training from Scratch
- Ran a controlled comparison of pre-trained (ResNet-50) and scratch-trained CNNs across data regimes from 200 to 10,000+ samples; pre-trained models led by up to 25 percentage points in validation accuracy below 1,000 samples.
- Found that scratch-trained models reached parity only beyond 5,000 images (with augmentation and learning-rate scheduling), giving a data-size heuristic for model selection in low-data regimes.

Stellar and Galactic Object Classification
- Built an end-to-end classification pipeline on 5M+ Sloan Digital Sky Survey (SDSS) observations using Scikit-learn and XGBoost, reaching 96% accuracy and a top-5% ranking on the SDSS classification benchmark.
- Engineered 15+ photometric and spectroscopic features, improving minority-class (galactic object) F1 by 12 points over the baseline feature set, the largest single contributor to pipeline gain; optimised for minority-class F1 rather than aggregate accuracy.

Wildlife Tracking and Alert System
- Deployed BioCLIP 2 as an on-device inference module in a Flutter/Firebase system, enabling low-latency species identification in bandwidth-constrained field environments without server round-trips.
- Designed an eventually consistent Firebase synchronisation layer to handle concurrent writes under unreliable connectivity, preserving data integrity and full offline operation for real-time alerts.

Space Flight Control System (C++)
- Architected a command-driven spacecraft simulation using a finite state machine, with explicit state validation and modular component separation to enforce correctness of mission-critical state transitions.

Industry Experience

Sunbird Straws Feb 2025 – May 2025
Software Engineer Intern (Web Development and UX Design) *Bangalore*
- Designed Node.js/PostgreSQL transaction pipelines for payment workflows with ACID-compliant state transitions, eliminating race-condition-driven inconsistencies in production database state.
- Optimised query patterns and synchronisation logic on a high-traffic administrative dashboard, reducing UI state-update latency under concurrent load.

Technical Skills

Languages	Python (NumPy, Pandas, Polars, PyTest), R, SQL (PostgreSQL), C++, Java
Machine learning	PyTorch, torchvision, OpenCV, Scikit-learn, XGBoost, HuggingFace (Transformers, TRL, PEFT), LoRA/QLoRA, preference optimisation (DPO/PPO), reward modelling, statistical analysis
Data & visualisation	Matplotlib, Seaborn, Plotly, Jupyter, data preprocessing, evaluation metrics
Systems & cloud	AWS, GCP, Docker, Git, CI/CD, Node.js, Firebase, Flutter (edge inference), PostgreSQL

Additional Training

HPC Bootcamp with NVIDIA & HP Enterprises 2026
Centre for AI, CHRIST (Deemed to be University), Bangalore
High-performance computing and inferencing on NVIDIA GPUs and NVIDIA enterprise solutions, covering RAG, LLM training and inferencing, model evaluation, and NVIDIA ecosystem integration.

Certifications

Scientific Computing with Python; Python Programming; Go Programming Language; C Programming; Future of AI.

Leadership and Service

University Student Council, CHRIST (Deemed to be University) Aug 2024 – Present
University Level Representative, IT and Infrastructure (Mar 2025 – Present); Deanery Level Representative (Aug 2024 – Mar 2025)
- Directed a 90+ member cross-functional team and 500+ student volunteers to deliver university events with 3,000+ attendees.
- Co-launched the institutional podcast series; work with university management on improving student life and experience.

Finance Society (Apex FinSoc), CHRIST (Deemed to be University) Nov 2025 – Present
Director (previously Vice President)
- Lead a 9-member team that researches and publishes monthly newsletters on quantitative finance and market analysis.

Future Leaders Programme for Christites Aug 2025 – Mar 2026
Cohort Member
- Year-long university leadership programme in community engagement and project management.
- Developed a marketing plan and SWOT analysis for a partner startup's service expansion; presented and adopted by the organisation for implementation

Interface 2024 (25th edition), National-Level IT Fest, CHRIST Sep 2024
Head of Hospitality and Core Committee Member
- Coordinated volunteers and participant welfare for delegations from colleges across the country.

Vismaya, Official Magazine of the School of Sciences Sep 2024
Core Committee Member
- Guided the editorial and design teams to publication; presented the magazine at the inauguration of Science Fest 2024.

Languages

English (fluent) · French (A2, through university coursework)