# Anindya Mondal

**Ph.D.**

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## Research Profile

- **Core Research:** Specializing in **RL post-training (GRPO/DPO)** and **inference-time agentic reasoning** to eliminate spatial/compositional hallucinations in unified multimodal foundation models.
- **High-Impact Record: 7 peer-reviewed publications** (4 first-author in top-tier venues: **ACM TOG '26**, **TMLR '26**, **AAAI '25**, **ICCV-W**), advancing spatial grounding and generative alignment.
- **Engineering Reproducibility:** Extensive track record of open-sourcing codebases and benchmarks (e.g., **OmniCount-191**, **CountLoop**, **MSQNet**) to the vision community.
- **Academic Mentorship:** Supervised 10+ MSc dissertations and delivered laboratory teaching for Master's-level applied ML coursework.

## Selected Publications (7 Total)

**First-Author & Core Multimodal Works:**

- **(TOG '26) ABACUS: Adapting a Unified Foundation Model for Bridging Image Count Understanding and Generation**
  **Anindya Mondal**, Sauradip Nag, Anjan Dutta — Web
  – Unified cycle-consistent GRPO objective for discrete reasoning and continuous synthesis.
- **(TMLR '26) CountLoop: Training-Free High-Instance Image Generation via Iterative Agent Guidance**
  **Anindya Mondal**, Ayan Banerjee, Sauradip Nag, et al. — Web
  – Training-free MLLM planner-critic loop allocating test-time compute to steer frozen diffusion.
- **(AAAI '25) OmniCount: Multi-label Object Counting with Semantic-Geometric Priors**
  **Anindya Mondal**, Sauradip Nag, Xiatian Zhu, Anjan Dutta — Web
  – Zero-shot spatial grounding via semantic-geometric priors. Reduced SOTA error by ~**50%**. Released **OmniCount-191** benchmark.
- **(ICCV-W '23) Actor-Agnostic Multi-label Action Recognition with Multi-modal Query (MSQNet)**
  **Anindya Mondal**, Sauradip Nag, Joaquin M. Prada, Xiatian Zhu, Anjan Dutta — Web · Code
  – Cross-modal query conditioning for long-tail video action grounding (+50% mAP).
- **(ICCV-W '21) Moving Object Detection for Event-based Vision using Graph Spectral Clustering**
  **Anindya Mondal**, Shashant R, Jhony H. Giraldo, Thierry Bouwmans, Ananda S. Chowdhury — Code
  – Fully unsupervised moving object detection for event cameras via graph Laplacian spectral decomposition.

**Collaborative Works in Graph Signal Processing:**

- **(EUSIPCO '22) Recovery of Missing Sensor Data by Reconstructing Time-varying Graph Signals**
  **Anindya Mondal**, Mayukhmali Das, Aditi Chatterjee, Palaniandavar Venkateswaran — Code
  – Formulated missing data recovery as time-varying graph signal reconstruction, surpassing SOTA by 54%.
- **(ICASSP '23) Time-varying Signals Recovery via Graph Neural Networks**
  John A. Castro-Correa, Jhony H. Giraldo, **Anindya Mondal**, et al. — Paper
  – Encoder-decoder GNN exploiting spatio-temporal correlations for robust missing-entry recovery.

## Research & Industrial Experience

**Research Scientist Intern (Multimodal Alignment)** *06/2026 – Present*
**Adobe Research** | Bengaluru, India

- **GRPO Post-Training:** Formulating dense, criterion-level process reward models (PRMs) to stabilize policy optimization for foundation models.
- **VLM Judges:** Constructing rubric-aware VLM judges to decompose complex generative prompts into verifiable spatial criteria.

**Doctoral Researcher (CVSSP)** *10/2022 – 10/2026*
**University of Surrey** | Guildford, UK | Supervisors: Dr. A. Dutta, Dr. X. Zhu

- Pioneered inference-time agentic reasoning (**CountLoop**) and cycle-consistent GRPO alignment (**ABACUS**) for compositional synthesis.
- Authored **OmniCount** (AAAI '25), introducing training-free open-vocabulary multi-entity spatial grounding.

**Research Intern** *05/2022 – 08/2022*
**Indian Institute of Science (IISc)** | Bengaluru, India
- Designed a source-free domain adaptation algorithm for robust visual classification under distribution shift.

## Education

**Ph.D., Artificial Intelligence** *10/2022 – 10/2026*
**University of Surrey (CVSSP)** | Thesis: *Integrating Auxiliary Information for Visual Scene Understanding and Generation*
**B.E. (Hons.), Electronics & Telecom** *08/2018 – 05/2022*
**Jadavpur University** | India | First Class with Honours (GPA: 8.79/10)

## Teaching, Academic Service & Honors

- **Mentorship & Teaching:** Primary technical mentor for 10+ MSc dissertations (2023–2026). Module Lead & TA for Master's/PhD-level *Applied Machine Learning* and *Computer Vision* [Teaching Reference].
- **Reviewer:** CVPR, ICCV, ECCV, NeurIPS, BMVC (2023–2026).
- **Grants/Awards:** AAAI-25 Travel Award, ICCV-23 Attendance Grant, University of Surrey Doctoral Studentship.

## References

- **Dr. Anjan Dutta**
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- **Dr. Xiatian Zhu**
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