

Case Study: Radiology Report Generation

Chest X-ray Report Generation Fine-tuning LLaMA-7B with LoRA on MIMIC-CXR

Dataset: MIMIC-CXR

- **Size:** 377,110 chest X-ray images + reports
- **Split:** 80% train, 10% val, 10% test
- **Input:** Image features + patient demographics
- **Output:** Findings + Impressions sections

LoRA Configuration

- **Base Model:** LLaMA-7B
- **Rank:** $r=16$
- **Alpha:** $\alpha=32$
- **Target Modules:** q_proj, v_proj
- **Learning Rate:** $3e-4$
- **Batch Size:** 16 (gradient accumulation=4)

BLEU-4

0.176 → 0.213

ROUGE-L

0.348 → 0.392

Training

8 hours (A100)

✓ Results & Insights

- 22% improvement in BLEU-4 score
- Better clinical terminology usage
- Reduced hallucinations (18% → 7%)
- Radiologist feedback: 85% acceptable quality