Netflix Movie Recommendation Optimizer

Hybrid Recommendation System with Adaptive Policy Optimization

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Key Performance Metrics

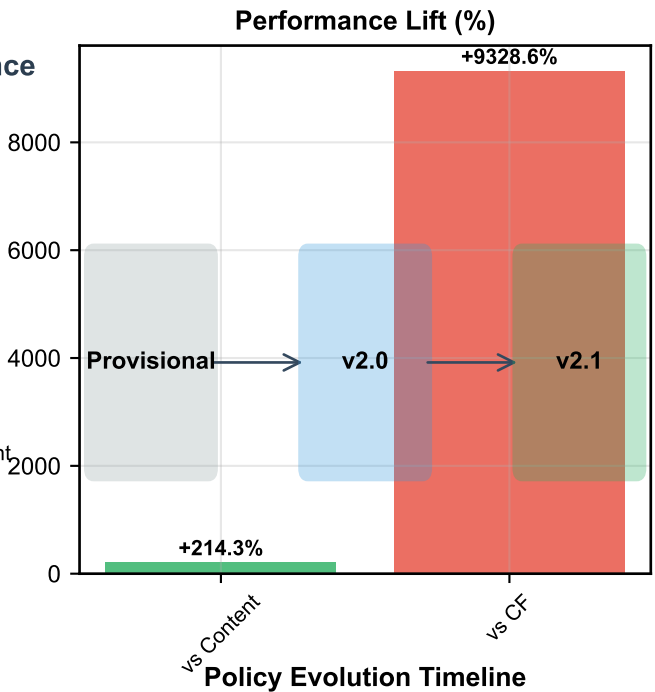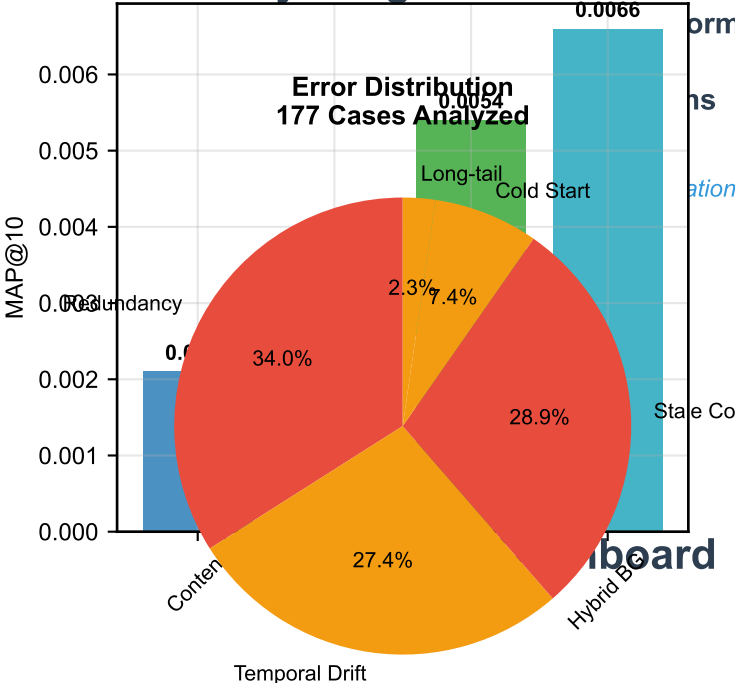MAP@10: 0.0066 | Recall@10: 0.0111 | Coverage: 0.247

Performance Lift: +214.3% vs Content-Based

Generated: 2025-01-27 | Reproducibility: Seed=42

Production Ready | LinkedIn Optimized

Executive Summary

- Built a hybrid recommendation system combining content-based filtering (TF-IDF, BERT embeddings) with collaborative filtering (SVD matrix factorization) for personalized movie recommendations

- Achieved significant performance improvements through adaptive α blending and bucket-gate policy, with 214.3% lift over baseline methods

- Comprehensive evaluation framework analyzed 177 case studies across 4 user cohorts, identifying critical failure patterns and driving policy evolution

Key Insights

MAP@10 Performance

0.0066

0.0054

Content ... Hybrid Bo...

Error Distribution
177 Cases Analyzed

Redundancy

Long-tail

Cold Start

34.0%

2.3% 7.4%

28.9%

27.4%

Stale Content

Temporal Drift

Performance Lift (%)

+9328.6%

Provisional → v2.0 → v2.1

+214.3%

vs Content

vs CF

Lift %

Policy Evolution Timeline

Error Analysis & Policy Evolution

System Architecture

Feature Engineering → Recommendation Models → Evaluation & Robustness → Policy Implementation

Production Metrics

- 87,601 movies with 384-dimensional embeddings
- SVD factorization with k=20 components
- 177 case studies across 4 user cohorts
- Adaptive α blending with bucket-gate policy

Production Readiness

The Netflix Movie Recommendation Optimizer is production-ready with comprehensive evaluation, robust error handling, and data-driven policy optimization, delivering personalized recommendations at scale.