

Movie Recommendation System: Machine Learning Project

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1. Motivation

Imagine you are a streaming platform executive facing a tough question: How can you help users discover movies they'll love from an overwhelming selection? Showcasing popular titles, focusing on genres, or highlighting star-studded casts might seem like the solution, but it's not that simple. The challenge of recommending the right movie is complex and multifaceted.

To address this, we are developing a Movie Recommendation System using machine learning techniques. By analyzing user preferences and movie attributes, we aim to identify critical factors for personalized recommendations, enhancing user satisfaction and engagement with tailored movie suggestions.

2. Related work - Research Papers

1. **National Library of Medicine:** Explores various filtering techniques including collaborative filtering, content-based filtering, context-based filtering, and hybrid filtering. It also delves into machine learning algorithms like K-Means clustering. [Link](#)

2. **Research paper by IEEE Xplore:** Employs Demographic Filtering, which offers general movie suggestions, Content-Based Filtering, which uses detailed metadata and Collaborative Filtering. [Link](#)

3. **Research Gate:** This uses matrix-based approaches to predict user preferences for items to measure similarities between users and items, respectively. These matrices help in providing personalized recommendations. [Link](#)

3. Timeline

Week 1-2: Clean and transform data, conduct data analysis, visualize data patterns, and understand dataset characteristics.

Week 3-4: Apply initial ML models and assess models using metrics like accuracy, precision, and recall.

Week 5-6: Refine models based on feedback and integrate new features for performance improvement.

Week 7-8: Test and implement different modeling techniques and feature combinations to enhance results. Perform thorough evaluation and comparison with previous models to measure improvements.

Week 8-9: Write initial drafts for report sections, summarize model performance and findings in the report, and prepare visualizations to support conclusions.

Week 10-11: Complete the report with a detailed conclusion and revisions, and ensure all sections are coherent and polished. Prepare for the final project presentation

4. Individual Tasks

- **Vikranth Udandara:** Data collection, preprocessing, and analysis. Implementation of machine learning models.

- **Swara Parekh:** Data collection, preprocessing, and analysis. Implementation of machine learning models.

- **Mohammad Ayaan:** Evaluation of machine learning models. Optimization based on performance metrics.

- **Ananya Garg:** Implementation of machine learning models. Integration of the final model into a CLI.

5. Final Outcome

The final outcome will be a Movie Recommendation System that can be accessed using a Command Line Interface. It will suggest movies to users based on their preferences. The system will utilize a combination of collaborative and content-based filtering techniques. The project will have a detailed report and presentation showcasing the methodology, models, evaluation results, and the final integrated system.