Offline optimization for user-specific hybrid recommender systems

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Abstract Massive availability of multimedia content has given rise to numerous recommendation algorithms that tackle the associated information overload problem. Because of their growing popularity, selecting the best one is becoming an overload problem in itself. Hybrid algorithms, combining multiple individual algorithms, offer a solution, but often require manual configuration and power only a few individual recommendation algorithms. In this work, we regard the problem of configuring hybrid recommenders as an optimization problem that can be trained in an offline context. Focusing on the switching and weighted hybridization techniques, we compare and evaluate the resulting performance boosts for hybrid configurations of up to 10 individual algorithms. Results showed significant improvement and robustness for the weighted hybridization strategy which seems promising for future self-adapting, user-specific hybrid recommender systems.

Keywords Recommender systems · Hybrid · Algorithms · RMSE · Optimization

1 Introduction

The availability of multimedia content nowadays, is booming exponentially in a wide variety of domains. Through the Internet, users have access to unlimited music resources (e.g., *Spotify*, *Pandora*, etc.), video platforms (e.g., *YouTube*, *Dailymotion*, etc.), image galleries

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