Sistem Rekomendasi Film menggunakan Metode Collaborative Filtering dan K-means Clustering dengan Particle Swarm Optimization

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Abstract
Movies are one of the forms of entertainment that many people are interested in. With the availability of streaming platforms, users can now conveniently enjoy movies anytime and anywhere. In addition, thanks to the recommendation system on the platform, it is easier for users to find films that suit their interests. Collaborative filtering is a commonly employed paradigm in recommendation systems. However, this paradigm has many challenges, one of which is scalability. Therefore, this research proposes a collaborative filtering method by implementing film groupings based on genre. The clustering process in this study was carried out utilizing the K-means algorithm. The Particle Swarm Optimization Algorithm is employed to facilitate the optimization of the determination of the initial centroid in K-Means. The PSO-KM method is subjected to a comparative analysis with the pre-existing system that has been deployed using the Movielens dataset. The experimental findings indicate that the method put forth exhibits greater optimality in terms of precision and recall when compared to the previous method. However, MAE only produces better values in just a few K values. Furthermore, our proposed system achieves promising results regarding scalability and provides accurate personalized movie recommendations while mitigating the common issue of a cold start problem. These findings indicate that grouping items using K-means integrated with PSO produces effective results in a recommender system.

Keywords: Recommender System, Collaborative Filtering, K-means, Particle Swarm Optimization