An Algorithm for Sequential Recommendation Based on Dynamic Item Frames

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Abstract

With the increasing use of mobile devices, the demand for short-form platforms such as Youtube shorts, Instagram Reels, and Tiktok is growing. These types of content are sensitive to trends that have characteristics like short consumption times and immediate feedback. Because of this reason, the content providers need to adopt a recommendation system that reflects these characteristics. In this paper, we propose a novel approach created on the concept of a frame consisting of a variety of contents with category information. In addition, we also propose a dynamic sequential recommendation that can be composed next items based on the concept of frame.

Keywords: Sequential Recommendation, Dynamic Programming, Algorithm

1 Introduction

The characteristics of short-form content are trend-sensitive, short consumption time, and instant feedback. Platforms for short-form content are making it easier to create and share short content [1]. The evolution of these platforms is fueling the consumption of short-form content. Users can view the content and react with likes, comments, etc. immediately [1]. The contents by short-form platforms are provided to users in a dynamic form. As a result, the recommendation process for short-form content is difficult to replicate with existing methods such as Collaborative Filtering (CF) [2]. It is difficult to dynamically apply the user's information using CF, since CF needs to utilize the information of other users on the platform, which takes a lot of time to calculate similarity and prediction [2]. For this reason, short-form requires a recommendation algorithm that can dynamically adapt to the user's preferences more quickly [1]. In this paper, we propose a dynamic item frame-based recommendation algorithm

that applies sequential recommendation to recommend new items by learning the order of previous users' recommendations and giving more weight to recent recommendations.
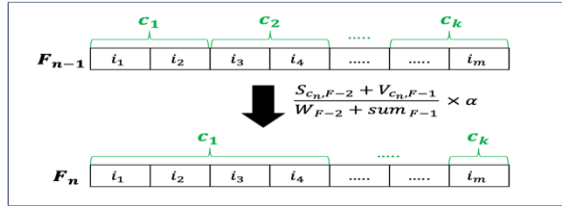
2 Our Approach

Figure 1: Example of dynamic frame configuration

Figure 1 shows an example of dynamic frame organization. Each frame is organized based on the category of content consumed by the user in the previous frame. In Figure 1, F_n refers to the nth frame, $S_{c_n,F-2}$ is the weight for category c_n two frames ago, $V_{c_n,F-1}$ is the number of views for the contents belonging to category c_n one frame ago, W_{F-2} is the sum of the weights for each category two frames ago, and sum is the total number of content views consumed one frame ago. The weight of each category is derived from the number of views of a particular category relative to the total number of contents in the frame. α means a constant that scales the number of content views in each frame. In other words, the algorithm proposed in this paper determines the proportion of categories to recommend in the current frame based on the proportion of categories in the content consumed by the user in the previous frame. It can adapt to changes in the user's preference for categories in real time and does not require as much computation as CF since it determines the recommendation items on a frame-by-frame basis.

3 Conclusion

In this paper, we proposed a dynamic frame construction that can perform content recommendation based on users' item consumption. Based on the proposed method, we can expect future research on hybrid methods with existing methods such as using features other than categories and matching to pre-calculated popular contents.

References

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