

We have other paintings as well!

Recommending non-popular cultural heritage in museum visits*

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Keywords: Recommender Systems · Cultural Heritage Information Retrieval · Fairness in AI.

1 Extended Abstract

When visiting The Louvre Museum, many visitors experience a sense of disappointment when they reach the most famous piece of cultural heritage in the world: the size of the *Mona Lisa* does not reflect its importance, and the large crowd that amasses in front of the painting makes it hard to appreciate it fully. However, most visitors will still insist on seeing this particular piece of art despite the presence of several thousand other artworks in the same museum, many of which arguably deserve more attention than what they get.

Humans naturally tend to select more popular items when given a choice [9]. This phenomenon, sometimes referred to as Popularity Bias, may be one motivation for the overcrowdedness of the *Mona Lisa*'s room [3], and explains why it is sometimes hard to promote visits to less familiar cultural artifacts [4].

In this position paper, we suggest that it should be possible, given both the advancement in recommender systems and the trend of digitization of cultural heritage and its connected metadata, to leverage recommender systems within the context of museum visits, with the double goal of allowing visitors to plan an engaging trip inside the museum personalized to their personal taste, and allowing museum curators to give more relevance to lesser-known artifacts in their collections.

Such a system, by accessing digitized information about the available artifacts, could help the users before the visit, by helping them plan a trip by selecting the items they will visit, and by leveraging implicit and explicit feedback from the users it can help personalize multimedia guides during the visit. After

* Partially supported by the project Creative Recommendations to Avoid Unfair Bottlenecks, granted by the Department of Information Engineering, University of Padova.

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the visit, further feedback can be collected for the improvement of future recommendations, possibly considering additional contextual and social information relevant to the visitors' engagement [11].

While there exists previous research on Recommender Systems for cultural heritage [7, 2], to the best of our knowledge one fundamental problem of these systems has not been considered in this context. Recommender systems can learn Popularity Bias from their human users and amplify this bias by recommending popular items [1]. While this may seem to undermine our previous claim, a lot of recent literature has focused on the mitigation of Popularity bias and on the general increase of Fairness in recommender systems [8]. The following paragraphs will describe some techniques that can be useful to this goal in the context we are considering. Figure 1 summarizes how the different approaches we mention could help form the personalized recommendations.

Contrarily to Collaborative Filtering-based approaches, content-based algorithms for recommendations are less prone to popularity bias [1]. One problem with content-based recommendations is the lack of good metadata: in many recommendation settings, only tags relating to genre/category are available, in addition to scarce metadata. In the museal context, however, we can expect the curators to include meaningful metadata about the artworks they describe in the museum database, making this road more viable. The use of user-based filtering can still be useful to the goal we propose, since recommending items that other users have appreciated can improve the overall engagement of visitors, by recommending items that other users have appreciated. We therefore argue that an hybrid system would best fit this scenario.

Another issue that needs to be considered is that of cold start. When a collaborative filtering system is first started, there is no data on what a user likes, and on what items are liked by users. The hybridization we propose with content-based recommendation already addresses this issue, but we also suggest that museums could use a pre-deployment period of data collection, by using implicit user feedback based on their movement inside museums [10]. However, both of these approaches do not solve the "new user" side of the cold start problem, and it is unlikely that a museum would have access to data regarding the preferences of new users. To mitigate this problem, a questionnaire that the visitor must compile before planning the visit could be employed to gather enough information to make personalized recommendations [6].

While developing a system such as the one we propose is not an easy undertaking for a non-IT institution such as a museum, the technology we described is already available and would only need to be adapted to this novel task. By leveraging these state-of-the-art techniques for recommendation, we argue that not only it is possible to expose less popular cultural heritage to more visitors without losing their engagement, but it is also possible to give more fair visibility to artists that have been neglected in the past, possibly for reasons not directly connected to the quality of their works [5].

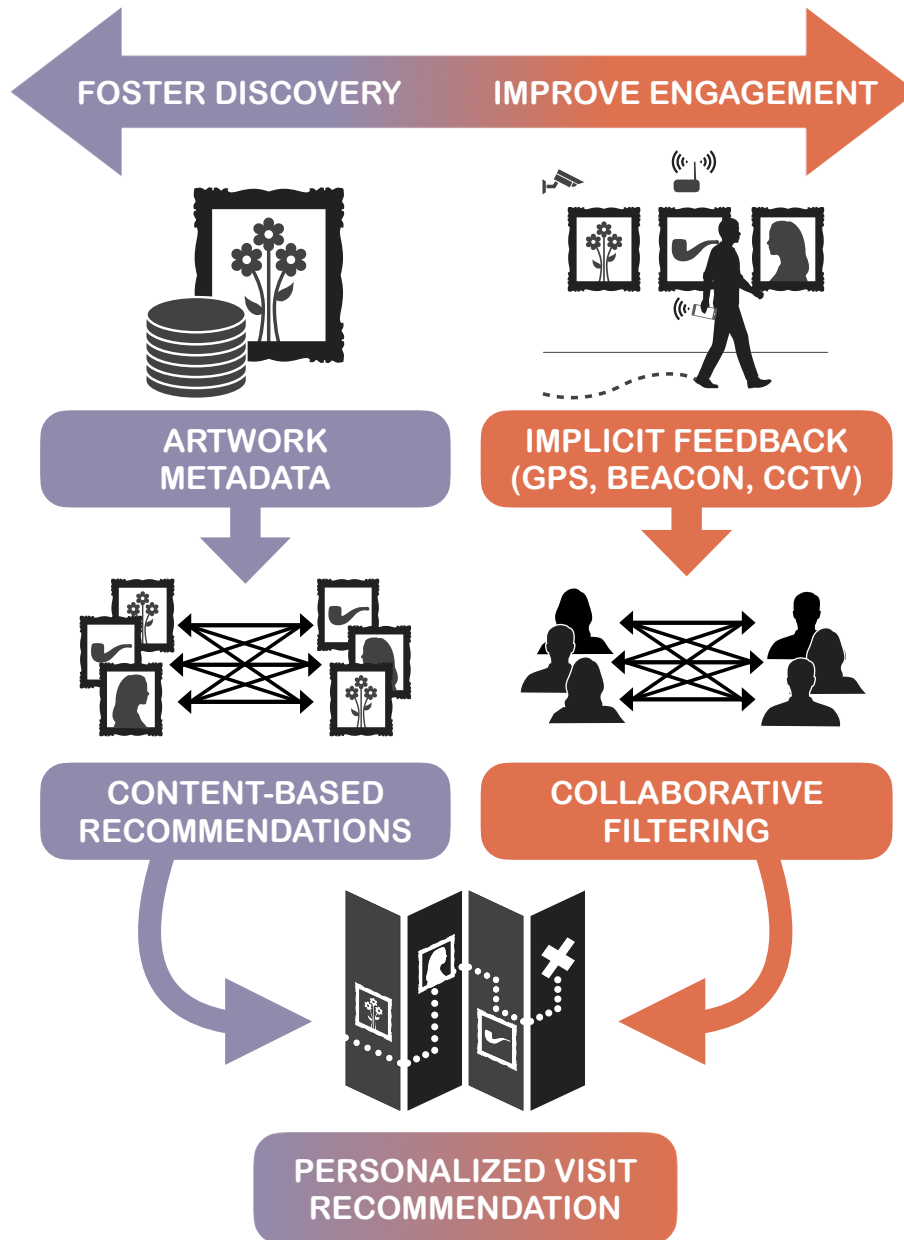


Fig. 1. This figure summarizes how an hybridization of different approaches and different data sources can help the creation of a recommender system for museum visits that manages the tradeoff between mitigating popularity bias and improving engagement.

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