

# Who do trust? Combining Recommender Systems and Social Networking for Better Advice

**Philip Bonhard**

Department of Computer Science  
University College London  
Gower Street, London WC1E 6BT  
+44 20 7679 3642  
p.bonhard@cs.ucl.ac.uk

## ABSTRACT

Faced with overwhelming choice people seek advice from their peers or other trusted sources. Collaborative filter recommender systems aim to emulate this process by filtering all the options according to the user tastes expressed through prior item evaluations. Until now the recommender systems literature predominantly focused on improving the algorithms for making suitable predictions for unrated items, while usability research mainly concentrated on interface issues with existing applications. This approach ignored the social elements of decision-making and advice seeking. The research here aims to consider a broader range of factors that motivate people in their decision making in order to improve recommender systems. Qualitative research conducted to date has shown that the relationship between recommender and recommendee has a significant impact on decision-making. Thus it is proposed that the impact of social elements on the quality of recommendations needs to be considered for the design of effective recommender systems, which can be addressed through the integration of social networking.

## Keywords

Recommender Systems, Social Networking, Decision Making, Advice Seeking, Human Centered Design

## INTRODUCTION

When faced with overwhelming choice and lacking specific domain knowledge, many people seek advice from peers and other trusted sources. Recommender systems emulate this process by drawing on user preferences and filtering the set of possible options to a more manageable subset.

Collaborative filter algorithms have emerged as one of the dominant strategies for computing recommendations mainly because they are not item domain bound. User preferences are expressed as item ratings and recommendations are based on matching users with similar

ratings, assuming that high correlation in ratings among users is an indicator of taste overlap.

Two major technical problems with this approach are 1) the *cold start problem* and 2) the *sparsity problem*. The former refers to the fact that the system cannot compute any recommendations for a new user because it has no information about his preferences. The latter is about the fact that the number of people who have rated particular items in the database might be relatively small compared to the total number of items. This means that there might not be significant similarity among users leading to possibly lower quality recommendations as they are based on little data.

## HCI Recommender Systems Research to Date

To date, Human Computer Interaction (HCI) examination of recommender systems has mainly focused on interface issues with existing applications [2, 4, 7]. One of the key issues addressed here is how the user's mental model of the system does not match the system model. Thus the aim is to manipulate the interface in such a way so as to make the system functionality transparent. This aims to generate trust in the system rather than applying knowledge about human decision making processes to the system design and thus supporting existing advice seeking strategies. Thus a revised HCI perspective should take a step back and consider human advice seeking and decision making strategies and incorporate them into recommender system design.

## Social Embedding of Recommendations

Recommendations are not made in rational isolation, which means that they are not evaluated merely by their information value. Rather they are delivered within an informal community of users and a social context [5]. The *social embedding* of a recommendation is crucial to understanding the decision making process of an individual; it is determined by factors such as experience, background, knowledge level, beliefs and personal preferences [3].

Sinha and Swearingen [6] found that when comparing recommendations from friends with collaborative filter recommender systems (movies or books), in terms of quality and usefulness, friends' recommendations are

preferred. Friends are seen as more qualified to make good and useful recommendations compared to recommender systems mainly because they are assumed to know more about the recommendee.

The psychology literature has examined advice seeking and developed theories for factual, objective domains, whereas advice seeking in subjective domains of taste, which the majority of recommender systems are designed for, have not yet sufficiently been explored [8].

Therefore there is a need for closer examination of how people actually seek advice, consider recommendations and make decisions in taste domains (like books, CDs, restaurants etc.) in real life and how that can be applied to the recommender systems design.

### Research Conducted & In Progress

The research here has two fundamental elements. The first is concerned with gaining a better understanding of how people seek advice and consider recommendations, whereas the second aims to apply those findings in a recommender system test bed permitting in vivo experiments and user studies. The overall goal is to investigate the effects of the quality of recommendations, the affective elements in decision-making and how these can be incorporated into useful recommender systems. Further the social elements in user matching and recommendation generation through collaborative filtering suggest interesting research potential for the integration of recommender system and social networking functionality.

In the first phase, a series of 12 one-on-one interviews and five focus groups (32 participants) were conducted with the aim of examining people's strategies for advice and recommendations seeking and decision making. The preliminary results indicate that the following concepts are crucial:

- The relationship between advice seeker and giver is a key indicator for taste overlap and mutual knowledge
- Decision makers differentiate between objective (factual & specification driven) and subjective domains (taste) and apply different advice seeking strategies for each
- Past experience with the recommender impacts on trust
- Aggregation of user opinions used as a popularity indicator
- Ulterior motives of a recommender are perceived to have a negative effect the quality of the advice given
- Decision making transfer & sharing of responsibility as a motivator for seeking advice

For the second phase of the research a testbed is currently being developed that will integrate a recommender system for restaurants with social networking functionalities thus taking a user connection centric approach. Similar to the

GroupLens' movielens project [1] this testbed seeks to recruit a broad base of heterogeneous users. The goal is to study the effect of different information and social elements on decision making and system usage in the short, medium and long run.

### Questions for Recommender System Research

Thus there are various interesting questions that beg further consideration and exploration by the recommender systems research community:

In how far can recommender systems and social networking applications (like Friendster or Orkut) benefit from each other in order to increase consistent user participation and contribution?

Can the introduction of social networking aspects such as existing networks of friends (or recommenders) increase trust in recommender systems?

Can user matching via collaborative filtering encourage communication among like-minded users?

What kind of metrics can collaborative filtering algorithms contribute not only to the computation of recommendations, but also effective user matching?

Is it possible to alleviate the cold start problem through explicit specification of one's closest neighbors?

Considering the above questions among others should lead to a greater understanding of its target users and thus contribute to more effective recommender system design.

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