

Dialog-based Example Critiquing System

Introduction

People increasingly face the difficult task of having to select the best option from a large set of multi-attribute alternatives, such as choosing an apartment to rent, a notebook computer to buy, or financial products in which to invest.

For structured items, the most common way to obtain the user's preferences is to ask the user to fill in a form or to answer a set of elicitation questions. However, when the user starts a search, she typically has only few well-defined preferences. According to behavioral studies, many of the preferences are *constructed* when considering specific examples. For example, user might add "apartment with balcony" after seeing such examples when looking for housing.

A good way to do this is through a mixed-initiative system based on *example critiquing* (see Figure 1). Example critiquing was first introduced by [1] and it works by suggesting k examples to a user in each interaction cycle. If the target item is not among the k examples, then a set of user critiques will be collected to refine the existing model. Suggesting a set of examples allows the system to correct for an incomplete or inaccurate model of the user's preferences. A lot of studies have been conducted in terms of designing effective interaction tools and suggestion heuristics [2, 3, 4, 5].

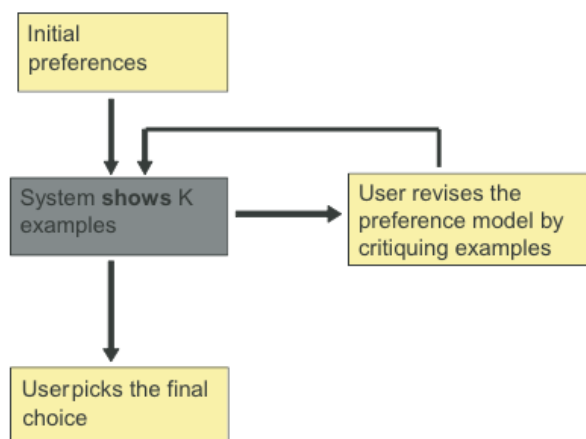


Figure 1

Your Task

In the researches before, the user interfaces of example critiquing systems are mostly based on forms or lists for users to fill or choose. In this project, your task will be implementing an example critiquing system using dialog conversation as an interface to interact with the users. You will:

1. Design the language patterns the system use to interact with users
2. Extract relevant contents from user query for further processing [2, 3, 4, 5]
3. Play with different models to give suggestions to users at each iteration
4. Implement such a system and conduct user studies

Requirement

- Experience with software and web development
- Experience with recommendation system, human computer interaction (HCI), natural language process will be bonus
- Quick learner and passionate about the topic

Reference

- [1] F. N. Tou, M. D. Williams, R. Fikes, D. A. H. Jr., and T. W. Malone. Rabbit: An intelligent database assistant. In AAI, pages 314–318, 1982.
- [2] Viappiani P, Faltings B. Adaptive Suggestions for Example based Tools[C]//ECAI 06 Multidisciplinary Workshop on Advances in Preference Handling. 2006 (LIA-CONF-2006-027).
- [3] Viappiani P, Faltings B, Pu P. Evaluating preference-based search tools: a tale of two approaches[C]//Proceedings of the Twenty-first National Conference on Artificial Intelligence (AAAI-06). AAAI press, 2006 (LIA-CONF-2006-029): 205-211.
- [4] Viappiani P, Faltings B, Pu P. Preference-based search using example-critiquing with suggestions[J]. Journal of artificial intelligence Research, 2006, 27: 465-503.
- [5] Viappiani P, Pu P, Faltings B. Conversational recommenders with adaptive suggestions[C]//Proceedings of the 2007 ACM conference on Recommender systems. ACM, 2007: 89-96.