Adaptive Kansei Search Method Using User’s Subjective Criterion Deviation

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ABSTRACT

Sensibility-vectors (kansei-vectors) are useful for retrieving objects like pictures, music, perfumes, and apparels on the Internet. The sensibility-vector is an array of values, each indicating a degree of feeling or impression represented as sensibility word or kansei word. However, even such an approach leaves a gap between user’s subjective sensibility (image, feeling) value and the corresponding one stored in the database. This paper proposes a search method to automatically and adaptively decrease such gaps by estimating a subjective criterion deviation (SCD) of the user’s search histories and fuzzy modeling. Conventional methods need tests and questionnaires beforehand to infer user’s individual sensibility to his or her instinct or impression. The proposed method automatically decreases such gaps without users’ burden caused by such conventional methods as requiring questionnaires. Moreover, this method reflects the dynamic changes in user’s preferences. Namely, this method does not need to know user’s preferences beforehand with questionnaires. An experiment was conducted by building and using a perfume search system. Experimental data results showed that the proposed method is effective.

Keywords: Human Modeling, Information Retrieval, KANSEI, Perfume Search, Sensibility Word, User Profiling

INTRODUCTION

E-commerce is becoming popular, and the demand for the commodity search on the Internet (online shops) has significantly increased over the last few years. Searches for commodities such as computers or books are less problematic since the search space can be narrowed down by the performance and functions of commodities or by textual information about their contents. However, items such as apparel, perfume, picture, music, and so on are chosen through visual, sensitive and instinctive measurement, and therefore are more difficult to search. Searches based on text or category selection are insufficient for such objects.
For such commodities, over-the-counter sales are the most common. In over-the-counter sales for cosmetics, salespeople can easily talk to customers face-to-face, ask individual customers about their needs, and then propose an article that fulfills those needs. This sales method has an advantage in which an article that best matches the customer needs can be proposed to the customer. However, it has the disadvantage that requires salespeople to engage in face-to-face communication with customers. This incurs extra employment costs for all those salespeople, resulting in the articles to become more expensive. In addition, the salespeople only serve in their business hours. This prevents customers from purchasing their desired articles anytime and anywhere, though it enables customers to find the best match article, taking their sensibility or instinctive preferences into consideration.

Thus, for online shopping of such commodities, there is a need for instinctive or sensibility-driven search techniques that can find commodities having better match with customer’s requests (Yamakawa & Sasaki, 2007). For this purpose, Kimoto (1999) has already proposed a search method introducing “sensibility words” or so-called “kansei words” which represent instinct or impression based features. Reacting on a stimulus, humans sense, feel, or experience affection, or have impressions such as “beautiful”, “gentle”, and “fragrant”. This ability is called sensibility or kansei. When a person listens to music, tastes a wine, or smells perfume, he /she has some impression that is represented or defined by a word called a sensibility word or a kansei word (Shirahama & Yanaru, 1999).

Expanding the use of this word, Yamaguchi and Kimura (2001) proposed a search method further introducing a sensibility-vector. The sensibility-vector is an array of values, each indicating a degree or rating of feeling / impression represented by a sensibility word. Namely, a numerical value rating is given to each sensibility word for performing a search. KBMJ (2000) proposed a search method that comprises a keyword search using text and an instinct / impression based search using a sensibility-vector.

When cosmetics or apparels are sold online, customer needs should be understood in detail so that an article or product that most meets the customer needs can be extracted, proposed to the customer and purchased by the customer. However, understanding the detailed customer needs on the Internet is difficult. Therefore, even if the above key word search and instinct / impression based search are used, extracting and proposing an article that most meets the customer needs based on the information has a limitation. Thus, for such articles or products, it has been difficult to construct online shopping systems that achieve a high customer satisfaction level.

Concretely, in the conventional instinct based search proposed by KBMJ, there is deviation between customers’ criterion for setting each instinct based feature parameter and a manufacture’s criterion for setting it. Namely, there is a gap between the subjective sensibility-vector (SS-vector) of searchers (consumers, customers, or users) and the SS-vector set by producers as default in the search systems. Therefore, the results desired by customers have not always been obtained. For example, even if a customer selects “a light color” for a certain article, the “light color” does not always match a manufacturer’s “light color.” To circumvent such problems, it is necessary to take into account personal deviations /variations in sensibility or kansei parameters, or each user’s “kansei” profile.

Another problem is that it requires much labor to construct and update “search target database” where such sensibility or kansei information about products is stored. Harada, Eto, and Takayanagi (2008) proposed and validated the method to automatically set appropriate value of kansei parameters for books based on the words in book reviews using the machine learning approach. Although this approach decreases the labor of setting kansei parameters, neither can this method learn personal deviations in such kansei parameters.
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