

Food Recommendations: Biases that Underpin Ratings

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ABSTRACT

The context in which preference information is gathered from users is recognised as one of the important factors in generating user models. Much research has been carried out into sensing and recording the physical and environmental contexts of user interactions, and it was shown that these affect the derived user modelling data. In this talk we introduce a new facet of context called a *Reasoning Context*, which could be informed by intrinsic factors, such as emotions, mood, biases, or user's thought patterns. If deciphered from the observable rating patterns, this contextual facet can be leveraged both in the user modelling and recommendation stages of the personalisation process.

We illustrate the discovery, stability, and exploitation of the Reasoning Context through a case study that uses a dataset of user ratings for a set of recipes. Each recipe was associated with a pre-populated set of domain features: the cuisine type, the main ingredient, the number of ingredients required, and the cooking complexity of the recipe. We applied a feature selection algorithm to uncover user reasoning patterns in the gathered rating data. The analysis showed which features each user appears to be reasoning on when providing their recipe ratings. For instance, some users were found to reason only on the main ingredient of a recipe, while others appeared to apply more complex reasoning that considered multiple features. We showed that the observed reasoning patterns and bias were stable and predictive.

The value of uncovering the users' reasoning patterns and using these as part of the Reasoning Context is two-fold. By knowing what features are important to users, a user modelling system could adjust the rating acquisition process and obtain ratings bearing high-value information, thus, reducing the data gathering load and alleviating the cold start problem. This knowledge can be invaluable when delivering recommendations aimed at diversity, serendipity and content discovery, since it can fuel an individual user-tailored diversity metric and lead to better recommendations.