

Personalized Mobile Information Recommendation Based on Fine-grained User Behaviors

Introduction

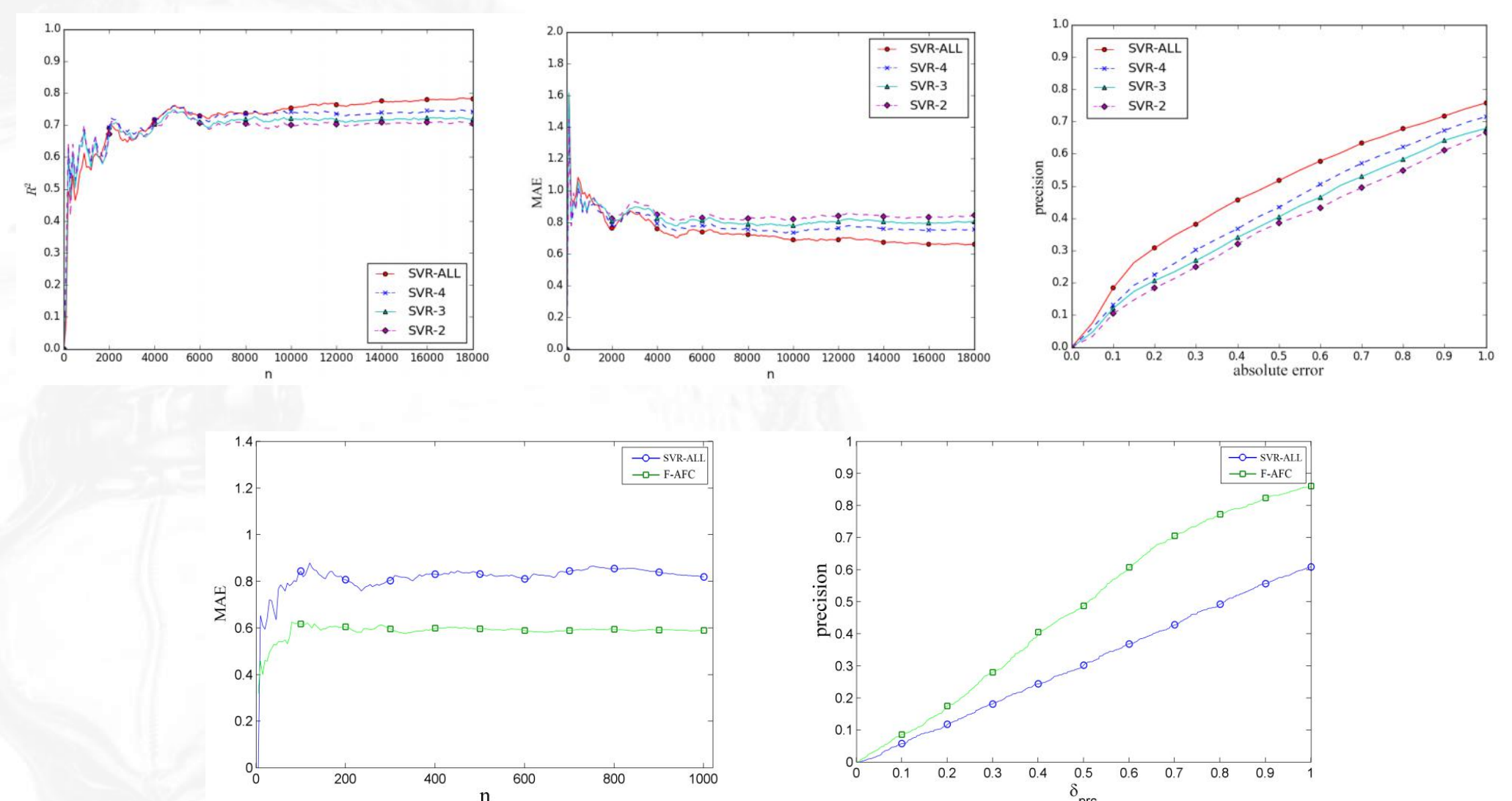
At present, the service mode of the information push application is centered on the mobile Internet. And the intelligent mobile terminal device is the main carrier of information in the mobile Internet environment. However, the traditional user personalized information acquisition method in the Internet era cannot be directly transplanted to the mobile terminal. The operation mode of the mobile terminal is completely different from that of the computer. There are also big differences in the format of the information and how the page is displayed. As a result, the users reading behaviors on the mobile terminal and on the computer terminal are quite different. Therefore, the existed analysis of the users reading behaviors cannot be directly used in the mobile-side recommendation system. We aim to study a personalized mobile information recommendation model based on fine-grained user behaviors. The main contributions of our paper are summarized as follow: In order to explore the objective short-term and local behavioral preferences of users, we propose six kinds of explicit fine-grained reading behaviors and integrate them into the user reading interest model to form the SVR-ALL model. The effectiveness of the proposed six explicit fine-grained user reading behaviors is proved by ablation experiments. Based on the users reading interest model and considering the different reading habits of different users, four implicit fine-grained user reading behaviors are further explored. A user reading behavior preference model named F-AFC is established. We also design a reasonable updating mechanism for the user s reading preference model, and further improves the accuracy of the model through continuous iteration in the updating process.

Methods

We propose six kinds of explicit fine-grained reading behaviors and integrate them into the user reading interest model to form the SVR-ALL model. The effectiveness of these six finegrained behaviors is verified by ablative experiments. On the basis of SVR-ALL model, four implicit fine-grained reading behaviors are further mined by considering the difference of user reading habits, and then propose the user reading preference model called F-AFC. The updating mechanism for user preference designed in F-AFC can fully reflect the changes of users reading habits in different periods. Experiments show that the accuracy of the user interest model considering user s reading preference and its update can be improved to some extent.

Graphics / Images

Some of the experimental charts are shown below. It is obvious from the first three figures that the model's expressiveness is also improved with the introduction of six kinds of fine-grained user reading behaviors. This fully demonstrates the effectiveness of the six explicit fine-grained user reading behaviors we proposed. Based on the above model, four implicit fine-grained user reading behaviors are considered and the corresponding preference updating mechanism is introduced. The results are shown in the last two figures, and it is obvious that the improved model is better than before.



Conclusions

In our work, the normalization method of user s fine-grained behavior acquisition and preprocessing is studied for mobile information push system, which can carry out unified normalization and quantification of fine-grained user behavior. A support vector regression model is introduced to model the fine-grained user s reading behavior, and the relationship between fine-grained user reading behavior and user reading interest is successfully established. And the validity of the proposed six explicit fine-grained behaviors is verified by ablation experiments. On this basis, considering the different reading habits of different users, four implicit fine-grained behaviors are introduced and the corresponding updating mechanism is designed to establish and update the user reading behavior preference model. Experiments show that the change of the user s reading interest can be explained by the user s fine-grained reading behavior. The proposed preference modeling and updating method have a certain improvement effect on the accuracy of reading interest calculation of users.