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Context-Aware Collaborative Prediction

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Preface

Collaborative prediction becomes a fundamental technique for Internet applications, and more contextual information is available in these real scenarios. For example, the contextual information includes time, location in context-aware recommendation, system, platform, position in click rate prediction. The state-of-the-art collaborative prediction methods are based on calculating the similarity between entities and contexts, but these similarities are not always reliable. Besides, these methods are usually not able to reveal the joint characteristics among entities and contexts.

Motivated by recent works of natural language processing and representation learning, this book presents three general frameworks for context-aware modeling of collaborative prediction based on contextual representation, hierarchical representation, and context-aware recurrent neural network. This book consists of two parts. The first part introduces the theory of contextual representation providing context-aware latent vector for entities and hierarchical representation which are constructed for the joint interaction of entities and contextual information. Besides, context-aware recurrent structure is proposed for modeling contextual information and sequential information simultaneously. To provide a background to the core concepts presented, it offers an overview of contextual modeling and the background of introduced models.

The second part presents how to implement these context-aware collaborative prediction models for real tasks, such as the general recommendation, context-aware recommendation, latent collaborative retrieval, and click-through rate prediction. The proposed techniques demonstrate significant improvements over existing methods; the key determinants are the incorporated contextual modeling techniques, i.e., contextual representation, hierarchical representation, and context-aware recurrent structure. The empirical results indicate the models outperform the state-of-the-art methods of context-aware collaborative prediction and context-aware sequential prediction, on different collaborative prediction tasks.

Beijing, China
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