Collaborative bipartite ranking for personalized prediction

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Abstract: Personalized prediction arises as an important yet challenging task, which predicts user-specific preferences on a large number of items given limited information. It is often modeled as certain recommender systems focusing on ordinal or continuous ratings. In this talk, I will present a new collaborative ranking system to predict most-preferred items for each user given search queries. Particularly, a -ranker is proposed based on ranking functions incorporating information on users, items, and search queries through latent factor models. Its probabilistic error bound is established showing that its ranking error has a sharp rate of convergence in the general framework of bipartite ranking, even when the dimension of the model parameters diverges with the sample size. Consequently, this result also indicates that the psi-ranker outperforms two major approaches in bipartite ranking: pairwise ranking and scoring. Finally, the proposed psi-ranker is applied to analyze the Expedia dataset with millions of booking records.