Propose a novel context-aware recommendation method

Present five types of features by slicing multi-dimensional data, and combine these features using learning-to-rank.

Use contextual information (e.g., location, time, weather) to estimate user's preference for recommendation.

By decomposing a query (Query: User + Context), we propose several types of ranking features that reflect various contextual effects.

By exploiting implicit feedback (usage log) for each record, there is only one positive feedback (item).

• Context can influence users' item preferences in various ways depending on the domain and application.
  • No context, user-independent, a set of contextual values, ...
  • Try to capture various contextual effects.

Adopt an existing LDA-based retrieval model [Wei & Croft, SIGIR, '06]

Capture past history & similar user/context using latent topic

Choose to use Ranking SVM.

Learn the weight of each feature

For pairwise preference, some negative examples are randomly sampled.

For each record, there is only one positive feedback (item).

Combine the features using learning to rank.

Evaluate with two real-world datasets

1. Bugs Music – music listening log
   • 3 contextual variables: time of day, date, weather
   • The system suggests new songs.

2. Foursquare – place check-in log
   • 3 contextual variables: GPS, time of day, date
   • Collected dataset using Twitter API.
   • The system suggests top-k places for a query.

How to evaluate?

Measure – Hit ratio, NDCG

Check if the model produces a list that includes the item in the record

Methods in Comparison

• Compare to three baseline methods – popularity (1st feature), user only (CF) (1st, 2nd), reduction-based approach [Adomavicius et al., TOIS, '05]

Outperforms several baseline methods.

Various features are used & Weight helps

Results