User Modeling on Twitter with WordNet Synsets and DBpedia Concepts for Personalized Recommendations

Guangyuan Piao, John G. Breslin
Insight Centre For Data Analytics, National University of Ireland, Galway

Introduction
Information overload on the current Social Web challenges users in their consumption of the information. User modeling for individual users plays a significant role in such a system and is a fundamental step for personalization as well as recommendations.

Figure 1. Information Overload on the Social Web.

Bag-of-Concepts approach using a Knowledge Base (KB) is preferred[1,2]:

Examples
Tweet#1: My Top 3 #lastfm Artists: Eagles of Death Metal(14), The Black Keys(6) & The Wombats(6)
Tweet#2: Just completed a 3.89 km ride. We’re gonna need more…
→ No concept can be identified: concept-alone approach is not enough!

Proposed User Modeling Strategy
Leveraging WordNet synsets and DBpedia concepts together for user modeling.

User Profile : \( P_u = \{ (i, w(u, i)) \mid i \in I, u \in U \} \) (1)
Here, \( I = \{ s_1, \ldots, s_k \} \cup \{ c_1, \ldots, c_m \} = \{ i_1, \ldots, i_n \} \) denotes the set of synsets in WordNet and concepts in DBpedia, and \( U \) denotes users.

Experiment Setup
Link Recommendations on Twitter
• task: recommending links using different user interest profiles as input
• item (link) profile: using the same modeling strategy based on the content of a link
• recommendation algorithm: cosine similarity

Evaluation Metrics
• MRR: Mean Reciprocal Rank
• S@N: Success rate at rank N
• R@N: Recall at rank N
• P@N: Precision at rank N

Preliminary Results

Figure 2. User Modeling Framework.

Figure 3. The quality of recommendations in terms of success rate and MRR (Mean Reciprocal Rank).

Figure 4. The quality of recommendations in terms of precision and recall.

References

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