Social-Network based Search and Ranking



CT

√iWatch

iCampus

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Introduction

•Emergence of social networks and Web 2.0 applications makes it interesting to see how social data can be used in improving the traditional textual search on the web.

•We can Improve the effectiveness of web search by utilizing social data available from users, users' actions and their underlying social network on the web.

•A <u>socio-textual</u> query is defined as $Q = \langle K_q; S_q \rangle$, where K_q is the textual part of query specified as a set of keywords in the query and S_{α} is the social part of query specified as the user u_{α} issuing the query and the social network G.

Related Work

- Search Services
 - People through their social networks are found and contacted directly to answer web queries
 - People and their networks are indexed and search engine has to find the most relevant people to send the queries/questions to
- Search using Social Networks (SSN)
 - The basic intuition behind SSN is the findings that state that a person's interest are very similar to her friends
- •Commercial Search Engines
 - Google and Bing integrate users '*like's* or '+1's into the search results

Application/Project

- Web 2.0 applications
 - flickr You Tube B
- f
 - Recommendation based on user's *friends*
 - Re-ranking the search results
- Web search
 - Re-ranking of search results based on *actions* by *user's friends*

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• Only show the *likes* and +1s and the actual ranking is not affected

Approach

- User Relatedness
 - $urf(u_i, u_j)$
 - Measures the relevance/relatedness between to users (nodes) in a social network (graph)

•User Weight

- *uwf(u*i)
- Captures the overall (global) importance of each user in the network

User Action

- $uaf(u_i, o_k)$
- Quantifies the importance of each object to each user not affected
- Context/application dependent
- YouTube videos:
 - {own(publish) : 1; favorite : 0:9; like : 0:7; comment : 0:4}.

 $v_i \in U_c$

0.54

0.52

***Social Relevance**

Challenges

•How to measure the relevance of document to the query

- Social Relevance?
- •How to combine social relevance with textual relevance accurately and seamlessly?
- •How to quantify the importance of users in the network?
- •How to measure the *relevance/relatedness* of users to each other?
- •How to model and quantify *actions* users perform on (web) objects/documents?
- •How to evaluate the new model/results?
- •How to test the proposed model on a real dataset with real users
 - •With documents/objects with textual tags/keywords
 - •With Social network/friendship

***Social-Textual Relevance** $stRel(o,q) = \alpha \times socRel(o,q) + (1-\alpha) \times texRel(o,q)$ $= \alpha \times \sum urf(u_q, v_i) \times uaf(v_i, o) \times uwf(v_i)$ $v_i \in U_o$ + $(1-\alpha) \times \sum tf(o,t_j) \times idf(t_j)$ $t_i \in K_a$ **Experiments** - SOC 1 -text 0.9 -sotext 0.7 - socBinary 0.68 0.8 -----sotextBinary 0.66 0.7 0.64 0.62 0.6 0.6 0.58 0.5 — SOC 0.56 —text 10 20 -sotext 1 2





0.2

0.4

0.6

0

 $socRel(o,q) = \sum urf(u_q, v_i) \times uaf(v_i, o) \times uwf(v_i)$









3

socBinary

0.8

