

Web Information Retrieval

Course Description:

This course gives a survey to the new research branches, introduces the state-of-the-art technologies, and discusses on open problems and challenges on Web information retrieval (Web IR). At the same time, the course focuses on the real applications in the Internet environment, making case study and detail analysis on commercial search engines (SE). The main topics of the course includes (but not limited to): IR in Web environment, such as link analysis, anti-spam, etc; question answering; opinion / sentimental analysis; social media and IR; personalized IR and recommendation; user behavior analysis; online advertisement; mobile search; and IR and SE evaluations.

The course is composed of lectures and student-conducted discussions.

Course Content:

1 Introduction to Information retrieval (IR)

- 1.1 history of IR
- 1.2 basic concept
- 1.3 introduction to research branches of IR
- 1.4 problems and future directions

2 IR in Web environment

- 2.1 content-based IR
- 2.2 Web link analysis for IR (PageRank, TrustRank, HITS, etc)
- 2.3 combination of content and link based IR
- 2.4 anti-spam in Web IR
- 2.5 problems and future directions

3 Question and Answering (QA)

- 3.1 background and history
- 3.2 the state-of-the-art QA technologies
- 3.3 problems and future directions

4 Opinion / sentiment Retrieval

- 4.1 research and application background
- 4.2 the state-of-the-art opinion retrieval technologies (in blog search, forum search, etc)
- 4.3 problems and future directions

5 social media and IR

- 5.1 social network and social media

- 5.2 information request on Web2.0 environment (discussion)
- 5.3 social media and IR
- 5.4 social network: virtual society vs. human society (discussion)
- 5.5 future directions

6 personalized IR and recommendation

- 6.1 background
- 6.2 the state-of-the-art personalized IR
- 6.3 the state-of-the-art recommendation
- 6.4 personalized IR and recommendation in our life (discussion)
- 6.5 problems and future directions

7 user behavior analysis for IR

- 7.1 what is user behavior analysis
- 7.2 categorization of user behavior and user intention
- 7.3 user modeling for IR
- 7.4 user behavior analysis vs. social psychology and cognition (discussion)
- 7.5 problems and future directions

8 online advertisement

- 8.1 background
- 8.2 business models and technical models for online advertisement
- 8.3 advertisement based on search
- 8.4 advertisement based on navigation
- 8.5 evaluation and impact analysis (discussion)
- 8.6 problems and future directions

9 Mobile search

- 9.1 background
- 9.2 relationships between web search and mobile search (discussion)
- 9.3 new applications and techniques in mobile search (discussion)

10 evaluation for IR and search engines

- 10.1 basic problem and the classification of evaluation
- 10.2 technique-based evaluation
- 10.3 user survey based evaluation
- 10.4 impact factors for user experience on Web search (discussion)
- 10.5 automatic evaluation technology

problems and future directions