Constructing and Evaluating State-aware Evaluation Metrics for Interactive IR

Complex search tasks that involve uncertain solution space and multi-round search iterations are integral to everyday life and information-intensive workplace practices, affecting how people learn, work, and resolve problematic situations. However, current search systems still face plenty of challenges when applied in supporting users engaging in complex search tasks.

State-aware adaptive IR system aims at identifying the states of complex tasks that contextualize human-information interaction and applying the knowledge about states in developing and evaluating adaptive system recommendations. Previous works have investigated the possibility of identifying the state of search tasks based on session and user interaction features [1]. However, how to embed the search state into an IR system to improve its performance in different search states is still under investigation. As studied in previous works, different types of evaluation metrics reflect user satisfaction from different perspectives [2]. Based on our preliminary analysis of a real-world dataset, this conclusion also holds for different task states. Hence, we propose to identify/construct evaluation metrics for different search states that can be used to optimize the state-aware IR systems.

In this project, the goals is to:

1) Evaluating the effectiveness of evaluation metrics in measuring users’ search satisfaction under different task states.
2) Developing new evaluation metrics that are better aligned with users’ search experience in different task states.
3) Developing state-aware learning to rank algorithms to adaptively improve search effectiveness and performance (e.g. reducing steps/queries needed for completing a task, increasing the number of relevant documents collected in a search session).

Requirements:
- Familiar to the concepts and algorithms in information retrieval and machine learning
- Good knowledge in statistical analysis
- Good programming skills

Contact:
Please indicate your interest along with your transcript and a brief description of your project experience.
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References: