Lightning Talk - Looking for the Movie Seven or Sven from the Movie Frozen?

A multi-perspective strategy for recommending queries for children

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ABSTRACT

As one of the largest communities that search for online resources, children are introduced to the Web at increasingly young ages [1]. However, popular search tools are not explicitly designed with children in mind nor do their retrieved results explicitly target children. Consequently, many young users struggle in completing successful searches, especially since most search engines (**SE**) do not directly support, or offer weak support, for children's inquiry approaches [2]. Even though children, as inexperienced users, struggle with describing their information needs in a concise query, they still expect SEs to retrieve relevant information in response to their requirements. As part of their capabilities, SEs often suggest queries to aid users in better defining their information needs. In fact, a recent study conducted by Gossen et al. [3] shows that children pay more attention to suggested queries than adults. Unfortunately, these suggestions are not specifically tailored towards children and thus need improvement [5]. While there exist multiple query suggestion modules, only few specifically target children. To address this problem, along with a need for more children-related tools, we rely on *ReQuIK* (**Re**commendations based on **Qu**ery **I**ntention for **K**ids), a query suggestion module tailored towards 6-to-13 year old children (introduced in [4]). *ReQuIK* informs its suggestion process by applying (i) a strategy based on *search intent* to capture the purpose of a query [1], (ii) a ranking strategy based on a *wide* and *deep neural network* that considers both raw text and traits commonly associated with kid-related queries, (iii) a filtering strategy based on the *readability* levels of documents potentially retrieved by a query to favor suggestions that trigger the retrieval of documents matching children's reading skills, and (iv) a content-similarity strategy to ensure *diversity* among suggestions.

For assessing the quality of the system, we conducted initial offline and online experiments based on 591 queries written by 97 children, ages 6 to 13. The results of this assessment verified the correctness of *ReQuIK*'s recommendation strategy, the fact that it provides suggestions that appeal to children and *ReQuIK*'s ability to recommend queries that lead to the retrieval of materials with readability levels that correlate with children's reading skills

To the best of our knowledge, *ReQuIK* is the only available system that can be coupled with SEs to generate query recommendations for children, favoring those that lead to easier-to-read, child-related resources, which can improve SEs' performance. The design of the proposed tool explicitly considers different patterns children use while searching the Web to adequately capture the intended meaning of their original queries. For example, if a child submits the query *"elsa"*, *ReQuIK* aims to prioritize query suggestions such as *"elsa coloring papers"* or *"elsa dress up games"* that correlate better with topics of interest to children rather than *"elsa pataky"*, as suggested by Google, which is more appealing to mature users. Other contributions of our work include a novel ranking model inspired by a deep-and-wide architecture that, while successfully applied for ranking purposes [6], has never been used in the query suggestions domain; a strategy to overcome the lack of queries written by children by taking advantage of general purpose children-oriented phrases; and a newly-created dataset [4].

CCS CONCEPTS

• **Information systems → Query suggestion**; • **Social and professional topics → Children**.

KEYWORDS

Query suggestions; children; search intent; dataset

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REFERENCES

[1] Nevena Dragovic, Ion Madrazo Azpiazu, and Maria Soledad Pera. 2016. Is Sven Seven?: A Search Intent Module for Children. In *ACM SIGIR*. 885–888.

[2] Elizabeth Foss, Allison Druin, Robin Brewer, Phillip Lo, Luis Sanchez, Evan Golub, and Hilary Hutchinson. 2012. Children's search roles at home: Implications for designers, researchers, educators, and parents. *JASIST* 63, 3 (2012), 558–573.

[3] Tatiana Gossen, Juliane Höbel, and Andreas Nürnberger. 2014. A comparative study about children's and adults' perception of targeted web search engines. In *SIGCHI*. 1821–1824.

[4] Ion Madrazo Azpiazu, Nevena Dragovic, Oghenemaro Anuyah, and Maria Soledad Pera. 2018. Looking for the Movie Seven or Sven from the Movie Frozen?: A Multi-perspective Strategy for Recommending Queries for Children. In *ACM CHIIR*. ACM, 92–101.

[5] Arif Usta, Ismail Sengor Altingovde, Ibrahim Bahattin Vidinli, Rifat Ozcan, and Özgür Ulusoy. 2014. How k-12 students search for learning?: analysis of an educational search engine log. In *ACM SIGIR*. 1151–1154.

[6] Hamed Zamani, Michael Bendersky, Xuanhui Wang, and Mingyang Zhang. 2017. Situational Context for Ranking in Personal Search. In *WWW*. 1531–1540.