Reviewer's report

Title: CDAPubmed: a browser extension to retrieve EHR-based biomedical literature

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Reviewer: Aurelie Neveol

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In this paper, the authors describe a system that highlights keywords in EHRs and allows users to build PubMed queries with these keywords in order to retrieve information directly relevant to the EHR from the literature. The problem of automatically linking EHRs to specifically relevant articles in the literature is an important one, with critical implications in clinical practice. Several research efforts have addressed it in the past decade and should be reviewed and discussed by the authors. The specific system described by the authors, CDAPubMed seems quite practical to use. However, the evaluation is limited by the small number of documents, and more importantly by the methodology, which does not use any of the usual metrics for Information Retrieval systems such as precision and recall based on expert relevance judgments, or usability.

Major Comments
- Page 2, the authors state that “There are no methods at present for searching and retrieving literature publications directly linked to the contents of specific EHRs” – the work by Cimino et al. on so-called “InfoButtons” is directly relevant as it exploits codes (e.g. ICD9 or ICD10 codes) assigned to EHRs by physicians to create literature queries (e.g. with MeSH keywords) based on the equivalence between terminologies in the UMLS and retrieve information directly relevant to the EHR from MEDLINE and other trusted sources. Some of this work also takes user profile (patient, health care provider, medical student/intern) into account to generate the results. Please consider the following publications for additional details and specific implementations:
  


- The section "Keyword identification..." essentially reports on the method used by the authors to assign relevant MeSH indexing terms to EHRs. There is a substantial body of literature addressing this problem (or closely related problems), which should be discussed. To name just a few:
  o A paper describing MedLEE, a system assigning UMLS concepts to clinical text, which can be restricted to terminologies such as MeSH or ICD: Friedman C, Shagina L, Lussier Y, Hripcsak G. Automated encoding of clinical documents based on natural language processing. J Am Med Inform Assoc. 2004 Sep-Oct;11(5):392-402. Epub 2004 Jun 7.

- The “results” section briefly presents the evaluation of the system and results obtained on 6 documents. Regardless of the evaluation methodology, this seems to be too small a document set to yield any conclusive results. In addition to the small size of the evaluation set, the authors seem to estimate the relevance of the queries constructed (automatically) based on the number of query terms in the query rather than any kind of expert relevance judgment. This seems flawed: a query with multiple query terms is certainly narrow, but does not necessarily imply relevance. Furthermore, the authors seem to also equate the “relevance” of the query with the “relevance” of the results yielded. I don’t think this is correct either. In brief, the evaluation needs to be done on a larger scale with evaluation measures that have been established as meaningful to show conclusive evidence about the system’s features, be it usability, relevance of documents retrieved, and so on.

Minor Comments
  • Page 3 “MeSH (...) used for article indexing in PubMed” -> This statement is erroneous and should read: “MeSH (...) used for article indexing in MEDLINE”
  • For consistency, database names should be used uniformly throughout the
paper. For instance, “PubMed” (on page 1) vs. “Pubmed” (on page 3). Both should have a capital “M”.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests