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Based on Their Importance to Patients

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Graphical abstract

Highlights

an unsupervised system for finding EHR terms important to individual patients
ensemble ranking and heterogeneous information fusion by biased random walk
distant supervision from Consumer Health Vocabulary for domain adaptation
system can be used to develop personalized interventions for EHR comprehension
system can be readily applied to other domains and applications

Abstract

Background: Allowing patients to access their own electronic health record (EHR) notes through online patient portals has the potential to improve patient-centered care. However, EHR notes contain abundant medical jargon that can be difficult for patients to comprehend. One way to help patients is to reduce information overload and help them focus on medical terms that matter most to them. Targeted education can then be developed to improve patient EHR comprehension and the quality of care.

Objective: The aim of this work was to develop FIT (Finding Important Terms for patients), an unsupervised natural language processing (NLP) system that ranks medical terms in EHR notes based on their importance to patients.

Methods: We built FIT on a new unsupervised ensemble ranking model derived from the biased random walk algorithm to combine heterogeneous information resources for ranking candidate terms from each EHR note. Specifically, FIT integrates four single views (rankers) for term importance: patient use of medical concepts, document-level term salience, word-occurrence based term relatedness,

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