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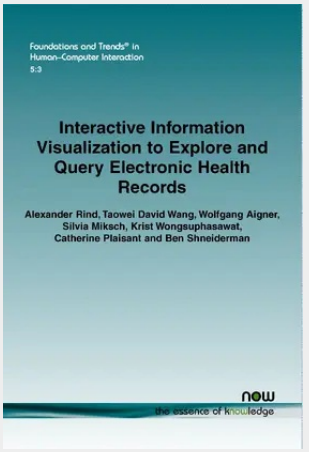
Interactive Information Visualization to Explore and Query Electronic Health Records



Physicians are confronted with increasingly complex patient histories based on which they must make life-critical treatment decisions. At the same time, clinical researchers are eager to study the growing databases of patient histories to detect unknown patterns, ensure quality control, and discover surprising outcomes. Designers of Electronic Health Record systems (EHRs) have great potential to apply innovative visual methods to support clinical decision-making and research. This work surveys the state-of-the-art of information visualization systems for exploring and querying EHRs, as described in the scientific literature. It examines how systems differ in their features and highlights how these differences are related to their design and the medical scenarios that they tackle. Some features of the book include: a survey of state-of-the-art information visualization systems from academic literature, a review of the visualization and interaction techniques found in 14 of these systems, including strengths and weaknesses, and compact descriptions of 32 additional EHR visualization systems, a summary of evaluation studies conducted in medical context, an overview of data visualization in commercial EHR systems, and recommendations and future research directions for information visualization in EHR systems. The monograph is written for both scientific researchers and designers of future user interfaces for EHRs. The aim is to help them understand this vital domain and appreciate the features and virtues of existing systems so they can create still more advanced systems. It concludes by identifying potential future research topics in interactive support for data abstraction, in systems for intermittent users, such as patients, and in more detailed evaluations.

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