Adopting a Graphical Perspective in Interactive Information Retrieval Research

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Abstract

Previous work in interactive information retrieval (IIR) has explored the relationships between task characteristics, session characteristics such as task difficulty and topic familiarity, and user behavior. This work is ultimately in the service of goals like personalization and search satisfaction. It is believed that predicting task or user characteristics from observable behavior can be used to tailor search experiences to the user and to the task, to further support the accomplishment of the user's goals. Often, this research takes the form of examining behaviors against one or two characteristics at a time, such as bivariate statistical tests or perhaps a simple multivariate regression. This dissertation shows that this framework is limited. It explains that such approaches are a special case of a more general framework - namely graphical modeling. The contribution of this dissertation is to show - conceptually, mathematically, and experimentally - that shifting to a new empirical research paradigm has not only been desired but is also necessary. It will show that graphical modeling can be used to answer research questions that cannot be answered by the previous approach. The experiments specifically explore the problem of task modeling and apply Structural Equation Modeling and Bayesian structural learning. This dissertation shows empirically that graphical modeling can produce findings that agree well with past literature and also can extend our understanding of the information seeking process. This dissertation discusses and shows the benefits and challenges of such a modeling approach.