Towards Probabilistic Causal Query Processing over Event Streams

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1 Abstract

Research in complex event processing has addressed a few basic relationships between events, including sequencing through time, using the Finite Automata as the enabling processing model. There are, however, a number of key relationships between event types yet to be addressed. For instance, we have to predict high level events likely to result from specific sets of low level events, identify the cause of these events, and check for the independent nature between events. In this research, a new processing model for complex events processing is proposed with a focus on the causality between events. The model is essentially an incremental causal network and enables the system to identify such complex relationships between events as causality and independence, which cannot be recognized by even the state-of-the-art finite automata based models. We use the temporal ordering between events to reinforce causal direction in Causal network built from continuous event stream.