Why do we need probabilistic approaches to ontologies and the associated data?

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Introduction
Today the term ‘ontologies’ almost always implies a knowledge representation formalism using a particular type of deterministic logic. The deterministic view of life (i.e., representing biomedical phenomena in deterministic logic) is not just simplistic but unrealistically, because science in general and modern medicine in particular are based on the principles of uncertainty. Probability theory is the most mature and established discipline to study uncertainty; thus, it is an integral part of any scientific method that involves hypothesis testing, controlled experimentation, and analysis of observations.

Ontologies that are not capable of incorporating probabilistic relations and enabling probabilistic inference cannot truly represent everything that modern medicine, biology, and chemistry teach us.

Some Characteristics

**Knowledge or justified probabilistic belief is a multifaceted Ontological Network (muON) has been developed at the Lister Hill Center in order to map extracted information into observed data. In other words, concepts and relations in muON are directly linked to data and their probabilities are inferred/justified partly from data.**

Bibliography


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