

The Full Mont(ology): Using Ontologies to Optimize the CS Literature Review

Kathryn Dahlgren
University of California, Santa Cruz

ABSTRACT

One of the most critical components of a research publication is a thorough literature review. This is a major issue for CS in particular given the rapid pace of developments, the emphasis on interdisciplinary work, and the frequent opportunities to publish in peer-reviewed forums [2]. The flood of papers from the multiplicity of traditional and nontraditional venues emerging in recent years renders the comprehensive literature review a significant challenge. For example:

- Good ideas may be lost in the constantly updated sea of publications;
- Recursively searching through references is very time-consuming; and
- Reference relevance is highly subjective.

Manual reference searching does not scale to the modern deluge of knowledge communication. Many current literature databases attempt to ease the process by hyperlinking references. However, HCI research indicates such solutions fundamentally discourage thorough traversals [1]. Other tools such as BiDO link publications, references, and authors in networks to facilitate navigation [3], but fail to consider metadata regarding how publications span fields or the degree of a particular reference's relevance.

We propose portraying CS research in a comprehensive and extensible ontology to provide a method for better navigating research literature across temporal and field boundaries. Unlike existing solutions, the ontology would connect publications, references, and authors with metadata derived from keywords, field classifications, and textual analyses, where edges between papers and references are weighted by relevance. Such a system promises to facilitate tracking the lineage of publications, identifying influential papers in particular fields, highlighting interdisciplinary work, and exposing less well-researched areas.

BODY

We need a comprehensive and maintainable ontology of CS research to drive scientific progress despite massive knowledge availability.

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