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Evan Patterson* (epatters@stanford.edu). *Knowledge Representation in Bicategories of Relations.*

We introduce the relational ontology log, or relational olog, a categorical framework for knowledge representation based on the category of sets and relations. It is inspired by Spivak and Kent's olog, a knowledge representation system based on the category of sets and functions. Relational ologs interpolate between ologs and description logic, the dominant formalism for knowledge representation today. On a practical level, we demonstrate that relational ologs have an intuitive yet fully precise graphical syntax, derived from the string diagrams of monoidal categories. We explain several other useful features of relational ologs not possessed by most description logics, such as a type system and a rich, flexible notion of instance data. In a more theoretical vein, we draw on categorical logic to show how relational ologs can be translated to and from logical theories in a fragment of first-order logic. (Received June 29, 2017)