Diagrammatic notations and reasoning have become a prominent focus of research over the last two decades. We have now reached a point where the techniques required to formalize diagrammatic logics and prove meta-level results, such as soundness and completeness, are well understood. However, the majority of progress has been on diagrammatic logics that are very limited in expressiveness. In addition to this, the emphasis on the design of their inference systems has been on obtaining soundness and completeness, without due regard to the usability of the proofs that can be written with the resulting logics. This overlooks a fundamental goal of the diagrammatic reasoning community: to provide logics that are more accessible than their symbolic counterparts.

In this talk, I will present an overview of the existing state-of-the-art in diagrammatic logics, focusing on spider diagrams as a case study as in Howse et al. (2005). I will show how diagrammatic logics are typically formalized, illustrate their inference rules and present the commonly used strategy to prove completeness, described by Burton et al. (2012), which is based on that devised by Shin (1994) in her seminal work on Venn-II. After this, I will present some examples of diagrammatic proofs that are less than desirable, thus demonstrating that there is a significant need for a change of emphasis on inference rule design. Recent work, by Stapleton et al. (2013), has begin to address this, by developing inference rules that exploit information which is observable from diagrams. Time permitting, I will also show how this approach to inference rule design has been exploited by Chapman et al. (2011) for concept diagrams. The concept diagram notation has been designed for ontology engineering, an area where there is significant potential for diagrammatic logics to be applied.

References


