Logics in Structured Argumentation System

Teng Ying

Abstract: Argumentation is an important way for dealing with incomplete and/or inconsistent information in human cognitive process. The study of argumentation has a formal side, focused on building computational models to resolve conflicts between arguments, represented by Dung's argumentation framework, and an informal side, focused on making descriptive models of conflicting arguments in daily life, such as Walton's new dialect. Unfortunately, these two directions hardly intersect. The research on structural argumentation try to bridge the gap between them, by making explicit how conclusions are drawn from premises and how arguments are conflicted.

There are a number of structured argumentation systems (SAS) for modelling argumentation in logic. They incorporate a formal representation of individual arguments and techniques for comparing conflicting arguments. Despite their common assumption, which is that an argument is a pair $<\Phi, \alpha>$ where Φ is a minimal subset of the knowledge base such that Φ is consistent and Φ entails the claim α, different underlying logics provide different definitions for consistency and entailment and hence give us different options for argumentation. This paper discusses some of the commonly used underlying logics in SAS, and compares them on various criteria that can be used to identify commonalities and differences between them. In the final part of the paper, some open issues are introduced.