

Monodic Temporal Resolution

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Abstract. While it is well known that the full First-Order Temporal Logic (FOTL) has no finite axiomatisation, until recently a more detailed analysis of fragments of the logic has not been available. However, a breakthrough by Hodkinson et.al. [4, 3], introducing a new fragment of the first-order temporal language, called the *monodic* fragment, in which all formulas beginning with a temporal operator have at most one free variable, has led to important enumerable and even decidable classes of FOTL. Yet, in order to utilise these theoretical advances, it is important to have appropriate proof techniques for the monodic fragment.

In this presentation, we extend the clausal temporal resolution technique, originally developed for propositional temporal logics [2], to enable its use in such first-order monodic classes, including the monodic guarded fragment with equality. Apart from practical considerations, the use of this approach provides us with increased understanding of the monodic fragment [1]. In particular, some new decidable monodic classes are obtained as corollaries of the completeness result for the temporal resolution method.

Section 01. Logic and Foundations

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