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A characterisation of open bisimilarity using an intuitionistic modal logic. (English)
[Zbl 07407774]

Summary: Open bisimilarity is defined for open process terms in which free variables may appear. The insight is, in order to characterise open bisimilarity, we move to the setting of intuitionistic modal logics. The intuitionistic modal logic introduced, called OM, is such that modalities are closed under substitutions, which induces a property known as intuitionistic hereditary. Intuitionistic hereditary reflects in logic the lazy instantiation of free variables performed when checking open bisimilarity. The soundness proof for open bisimilarity with respect to our intuitionistic modal logic is mechanised in Abella. The constructive content of the completeness proof provides an algorithm for generating distinguishing formulae, which we have implemented. We draw attention to the fact that there is a spectrum of bisimilarity congruences that can be characterised by intuitionistic modal logics.

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03B70 Logic in computer science
68-XX Computer science

Keywords:
bisimulation; modal logic; intuitionistic logic

Software:
SPEC; MWB

Full Text: arXiv Link

References:
- Zbl 1267.68014


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