Abstract.

Mechanised Modal Model Theory

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1 Introduction

[1.5p]

Contributions This paper presents the first mechanised proofs of a number of basic results from the first two chapters of Blackburn *et al* [1] (e.g., bounded morphisms, bisimulations and the finite model property *via* selection), as well as

- the saturation of ultraproduct models;
- modal equivalence as bisimilarity between ultrafilter extensions; and
- a close approximation of van Benthem's Characterization Theorem.

We also discuss where HOL's simple type theory lets us down: some standard results (including the best possible statement of van Benthem's Characterization Theorem) seem impossible to prove in our setting.

1.1 Related Work

2 Syntax, Semantics and the Standard Translation

[1.5p]

3 Basic Results

[2p]

4 Mechanizing Ultrafilters and Ultraproducts

[1p]

5 Bisimilarity and Ultrafilter Extensions

[2p]

6 Saturation of Ultraproduct Models

[3p]

7 Van Benthem's Characterization Theorem

[3p]

8 Conclusion

[¡1p]

References

1. Blackburn, P., de Rijke, M., Venema, Y.: Modal Logic. Cambridge University Press (2001)