Title of the talk: Intuitionistic Universal Models of *NNIL*-Formulas

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Abstract:

NNIL-formulas are formulas that have **n**o **n**esting **o**f **i**mplications to the **l**eft. A. Visser, D. de Jongh, J. van Benthem and G. Renardel de Lavalette showed in [2] that *NNIL*-formulas are exactly those formulas that are preserved under taking intuitionistic submodels. As a consequence, *NNIL*-formulas are also preserved under taking intuitionistic subframes. Using this insight, N. Bezhanishvili showed in [1] that *NNIL*-formulas are sufficient to axiomatize intuitionistic subframe logics, which was axiomatized by M. Zakharyaschev [3],[4] using formulas containing only $\wedge$ and $\rightarrow$ as connectives.

The n-universal model $\mathcal{U}(n)$ of intuitionistic propositional calculus (**IPC**) is isomorphic to the finite part of the n-Henkin model. In this talk, we give the construction of n-universal models $\mathcal{U}(n)^{NNIL}$ of *NNIL*-formulas with n variables. The domain of $\mathcal{U}(n)^{NNIL}$ consists of equivalent classes of rooted generated models of $\mathcal{U}(n)$ induced by two-way subsimulations. The fact that n-universal models of *NNIL*-formulas come from n-universal models of **IPC** enables us to prove properties of *NNIL*-formulas in an easy way. In particular, the theorem proved in [2] that formulas preserved under subsimulations are equivalent to *NNIL*-formulas becomes a natural consequence of the properties of $\mathcal{U}(n)^{NNIL}$.

References

[1] N. Bezhanishvili. *Lattices of intermediate and cylindric modal logics,* PhD Thesis, University of Amsterdam, 2006.

[2] Visser, A., de Jongh, D., van Benthem, J., and Renardel de Lavalette, G. *NNIL, a study in intuitionistic propositional logic*, in Modal Logics and Process Algebra: a bisimulation perspective (1995), A. Ponse, M. de Rijke, and Y. Venema, Eds., pp. 289326.

[3] M. Zakharyaschev, *On intermediate logics*, Soviet Mathematics Doklady 27 (1983), 274277.

[4] M. Zakharyaschev, *Syntax and semantics of superintutionistic logics*, Algebra and Logic 28, 4 (July 1989), 262282.