A Polynomial Model for Multi-Valued Logics with a Touch of Algebraic Geometry and Computer Algebra*

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Abstract

In this paper, a polynomial model (residue class ring) for a given p-valued propositional Logic (p prime), is constructed. This will allow the study of logical deductions using Computer Algebra techniques (Gröbner Bases). Also, an interesting interpretation of $\models$ and Kleene's style $\rightarrow$ and their relation from the point of view of Algebraic Geometry (in terms of algebraic varieties) will be given. Only modest requirements about the good behaviour of the Logic will be assumed.

This approach makes it possible to move a step forward and treat Knowledge Based Systems (KBSs) based on multi-valued Logics.

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