

عنوان مقاله:

Expanding Belnap ۲: the dual category in depth

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خلاصه مقاله:

Bilattices, which provide an algebraic tool for simultaneously modelling knowledge and truth, were introduced by N.D. Belnap in a ۱۹۷۷ paper entitled How a computer should think. Prioritised default bilattices include not only Belnap's four values, for 'true' (t), 'false' (f), 'contradiction' (\top) and 'no information' (\perp), but also indexed families of default values for simultaneously modelling degrees of knowledge and truth. Prioritised default bilattices have applications in a number of areas including artificial intelligence. In our companion paper, we introduced a new family of prioritised default bilattices, J_n , for $n \geq 0$, with J_0 being Belnap's seminal example. We gave a duality for the variety V_n generated by J_n , with the dual category X_n consisting of multi-sorted topological structures. Here we study the dual category in depth. We axiomatise the category X_n and show that it is isomorphic to a category Y_n of single-sorted topological structures. The objects of Y_n are ranked Priestley spaces endowed with a continuous retraction. We show how to construct the Priestley dual of the underlying bounded distributive lattice of an algebra in V_n via its dual in Y_n ; as an application we show that the size of the free algebra $FV_n(1)$ is given by a polynomial in n of degree ۶.

کلمات کلیدی:

Bilattice, default bilattice, natural duality, multi-sorted natural duality, Priestley duality, piggyback duality

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