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Do causal sets have symmetries?

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Causal sets are locally finite, partially ordered sets (posets), which are considered as discrete models of spacetime. On the one hand, causal sets corresponding to a spacetime manifold are commonly generated with a random process called sprinkling. This process keeps only a discrete set of points of the manifold and their causal relations (loosing the spacetime symmetries in each sprinkle).
On the other hand, the main conjecture of causal set theory is that given an ensemble of causal sets there is a corresponding spacetime manifold and the continuum symmetries of it are like all manifold properties "reconstructible" from the partial orders of all the causal sets in the ensemble. But most generic finite posets have very few layers ("instances of time") in contrast to sprinkles with many layers in a sufficently large spacetime region.
In a recent project, I investigated the automorphism groups of (finite) posets in order to identify and classify their symmetries systematically. The comparison of local symmetries of generic posets (including Kleitmann-Rothschild orders) with sprinkled causal sets may help us to find posets that can serve as discrete spacetime models in causal set theory.
In the discussion of the results, we use the representation of posets as Hasse diagrams. I developed some simple tools (available for LaTeX and online) that will be explained alongside.

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