TOPOLOGY SEMINAR

Simplicial distributions, convex categories, and contextuality

By

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Abstract: In a quantum mechanical experiment, the data describing outcome probabilities consists of a family of probability distributions indexed by subsets of jointly permissible measurements. The simplicial framework introduced in the first talk models this data as a morphism in the Kleisli category associated with the distribution monad. By studying certain properties of the distribution monad, we gain insights into the enriched structure of this Kleisli category. These categories, referred to as convex categories, have a one-object version known as convex monoids. In this talk, we characterize contextuality as a monoid-theoretic concept by introducing a weak notion of invertibility for convex monoids. Our main result is that a simplicial distribution is noncontextual if and only if it is weakly invertible.

Date: Monday, Nov 4, 2024
Time: 13:30
Place: ZOOM

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