

THE UNIVERSITY



OF HONG KONG

*Institute of Mathematical Research
Department of Mathematics*

Mathematics for Machine Learning Seminar

Presheaf Models and Dynamic Logic Contextuality in Labelled Transition Systems (research presentation)

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Abstract

In theoretical computer science, a labelled transition system (LTS) comprises of states, transitions between states and a set of labels that denote these transitions. This talk, first, presents existing research on expressing LTS using presheaf models, leading to a formulation modelling concurrent computation. Representation of presheaf models bridges the pure computation and semantic aspects, clarifying the meaning of various operations on them. On this basis, the research extends the method by incorporating probabilities into presheaf models, resulting in a transitional formulation of sheaf-theoretic structures which characterize non-locality and contextuality.

Additionally, this talk introduces our results revealing that the contextuality is measurable and can be linked to dynamic logic, such as the Heyting algebra, with the help of Yoneda lemma from category theory.

Members of the Department of Mathematics are welcome to attend. Any content designated as confidential by the presenter should be kept confidential.

Date: April 23, 2026 (Thursday)
Time: 3:00 pm – 4:00 pm
Venue: Room 210, Run Run Shaw Building HKU