



Quantum Computing Seminar

Frobenius algebras and complementarity

By

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Abstract: In quantum theory observables that do not commute are considered incompatible. Maximally incompatible, or complementary, observables are such that measurement of one destroys all information about the other. This property is modeled in CQM using the notion of Frobenius algebras. These Frobenius algebras may be seen as an enhancement of the monoids discussed in the previous talk using the theory of duality in symmetric monoidal categories. We will additionally discuss extra properties and structures on Frobenius algebras, in particular, dagger Frobenius algebras. Frobenius algebras are also of substantial importance in the study of topological quantum field theory (TQFT).

References:

1. Heunen, Chris, and Jamie Vicary. Categories for Quantum Theory: an introduction. Oxford University Press, 2019. Chapter 5, Chapter 6.
2. Joachim Kock. Frobenius algebras and 2D topological quantum field theories. Cambridge, 2010. Section 3.6.
3. Bob Coecke, Dusko Pavlovic and Jamie Vicary. A new description of orthogonal bases. Mathematical Structures in Computer Science (2012).

Date: Friday, April 5, 2024

Time: 14:00

Place: SA141 - Mathematics Seminar Room & ZOOM

To request the event link, please send a message to selman.ipek@bilkent.edu.tr