

Mathematics and Physics Seminar Series



Announcing

A Seminar Presentation

on Tuesday

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at 3:00 pm in

Dodd's Hall 102 A

at The University of New Haven

An inductive view of rewriting for a syntax of open networks

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Abstract: Networks exist across disciplines and so have developed idiosyncrasies local to the various fields in which they are used. A recent research program uses category theory to abstract away domain specific quirks, centralize compositionality, and develop a common language for reasoning about networks. In this talk, we introduce *structured cospans*, a syntax for networks. Starting with a functor $L: \mathbf{A} \rightarrow \mathbf{X}$ from a category \mathbf{A} of “interface types” to a category \mathbf{X} of “networks”, a structured cospan is a pair of morphisms with common codomain $La \rightarrow x \leftarrow Lb$ in \mathbf{X} . The object x represents a network and La, Lb represent the inputs and outputs of x . We use pushouts to connect compatible networks. Making several mild assumptions about $L, \mathbf{A}, \mathbf{X}$, we show that structured cospans admit a rewriting theory generalized from the double pushout style popular in graph theory. The main result is a categorical syntax that admits the ability to rewrite an entire network by rewriting its sub-networks individually then reconnecting them together. We then show applications for specific network types and avenues for further research.

Further Information

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