

Daniel Cicala  
University of California, Riverside

*Modeling graphical calculi with symmetric monoidal compact closed bicategories*

Compositionality is playing an increasingly large role in the study of complex systems. With this viewpoint, one studies a complex system by analyzing its smaller components and their connections. This is particularly useful for open systems admitting a graphical syntax. Two common features of such systems are the use of diagrams with ‘inputs’ and ‘outputs’, and an equality given by rewrite rules. In this talk, we introduce a framework in which these systems fit. In particular, we organize an open system into a symmetric monoidal and compact closed bicategory whose 0-cells are input and output types, 1-cells are the system’s diagrams, and 2-cells are their rewritings. We illustrate our framework by giving a bicategorical syntax for a commutative monoid.