

Generalized enrichment of categories

Tom Leinster

The usual context for enrichment is that we consider categories enriched in a monoidal category. However, it is easy to see how we might also speak of categories enriched in a multicategory; moreover, there is an existing theory of categories enriched in a bicategory. We show how all these kinds of enrichment can be encapsulated in a single notion: that of a category enriched in an **fc**-multicategory’.

Specifically, we start by defining **fc**-multicategory’, and see how monoidal categories, ordinary multicategories, bicategories and double categories all arise as special cases. We then say what a category enriched in an **fc**-multicategory is, and see that this generalizes the familiar cases. Further examples are also given. If time permits, we will indicate briefly how all of this is just the most simple instance of a much larger theory.