ODD KHOVANOV HOMOLOGY AND 2-SUPERCATEGORIES

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Abstract:

Khovanov homology and odd Khonanov homology are invariants of knots that both "categorify" the Jones polynomial. Much like how the Jones can be constructed using the representation theory of $U_q(\mathfrak{sl}_2)$, Khovanov homology has been described using a "categorification" of the representation theory of $U_q(\mathfrak{sl}_2)$. This construction is best expressed in the categorical framework of 2-categories, reminiscent of the fact that Khovanov homology's original construction is based on symmetric algebras.

On the other hand, the construction of odd Khovanov homology is based on exterior algebras. In order to give a similar representation theoretic construction, one is naturally lead to 2-supercategories, that is 2-categories with (possibly) anti-commuting 2-morphisms. This talk will give an in-depth overview of the above and point toward recent work (j.w.w. Pedro Vaz) giving such a representation theoretic construction of odd Khovanov homology, with emphasis on results regarding 2-supercategories.