

# LIFTING ADJUNCTIONS TO CATEGORIES OF ALGEBRAS

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Distributive laws provide a method for lifting endofunctors on a category  $\mathcal{C}$  to the category of algebras of a monad on  $\mathcal{C}$ . This was generalised by Street to non-endofunctors, by considering so-called morphisms of monads on possibly different base categories. In fact, if the monad has more structure, such as being a bimonad, then an appropriate notion of bimonad morphism introduced by Bruguières and Virelizier may be used to give the lifted functor a strict monoidal structure.

This talk will discuss an analogous lifting problem for adjunctions. Of particular interest will be parametric adjunctions, such as the familiar tensor-hom adjunction in a closed monoidal category. Lifts of such an adjunction are controlled by suitable mixed lifting data, subject to an invertibility condition of their mates. As an application, I will give an alternative proof of a result by Berger, Saracco, and Vercruysse: an algebra over a commutative ring  $R$ , which lifts the internal-hom of  $R\text{-Mod}$  in a suitable way, is a Hopf algebra.

This talk is based on joint work in progress with Sebastian Halbig and Paolo Saracco.