CHARACTERIZATIONS OF LAX ORTHOGONAL FACTORIZATION SYSTEMS

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ABSTRACT. In this talk we will study the lax orthogonal factorization systems (LOFSs) of Clementino and Franco, with a particular focus on finding equivalent definitions of them.

In particular, we wish to define them as a pair of classes $\mathcal{E}$ and $\mathcal{M}$ subject to some conditions. To achieve this, we will reduce the definition of a LOFS in terms of algebraic weak factorization systems (defined as a KZ 2-comonad L and KZ 2-monad R on the 2-category of arrows $[\mathbf{2}, \mathcal{C}]$ with a 2-distributive law $LR \Rightarrow RL$) to a more property-like definition (meaning a definition with less data but more conditions).

To do this, we replace strict KZ 2-monads with the property-like definition of KZ pseudomonads in terms of kan-extensions due to Marmolejo and Wood. In addition, pseudo-distributive laws involving KZ pseudomonads have a property-like description which will be used. Thus one can deduce the conditions the classes $\mathcal{E}$ and $\mathcal{M}$ must satisfy.

We will also consider some similarities and differences between LOFSs and (pseudo-)orthogonal factorization systems, and will extend their definitions to include universal fillers for squares which only commute up to a comparison 2-cell.

This is joint work with John Bourke, and is currently a work in progress.