Fernando Lucatelli
CMUC, University of Coimbra

Aspects of descent via bilimits

There are two main constructions in classical descent theory: the category of algebras and the descent category (see, for instance, [6, 2]). These constructions are known to be examples of 2-limits (see, for instance, [8, 8, 1]). The aim of [6] was to investigate whether pure formal methods and commuting properties of limits are useful in proving classical and new theorems of descent theory in the classical context of [2, 3].

In Aveiro (CT2015), we showed how commuting properties of bilimits gives us a proof of the celebrated Bénabou Roubaud Theorem. Now, the aim of this talk is to give an idea of the new results on Descent Theory obtained from the perspective of [6].

In particular, if time allows, we shall talk about the relation between monadicity, Beck-Chevalley and commutativity of bilimits, and give the definition of Unbiased Descent Data, proving that it is *equivalent* to the biased one, giving comments to three-dimensional descent theory.

References:

[1] J. Bénabou and J. Roubaud, Monades et descente, *C. R. Acad. Sci. Paris Sér.* A-B 270 (1970) A96-A98.

[2] J. W. Gray, Quasi-Kan extensions for 2-categories, *Bull. Amer. Math. Soc.* 80 (1974) 142–147.

[3] G. Janelidze, Descent and Galois Theory, *Lecture Notes of the Summer School in Categorical Methods in Algebra and Topology, Haute Bodeux, Belgium* (2007).

[4] G. Janelidze and W. Tholen, Facets of descent I, *Applied Categ. Structures* 2 (1994), no. 3, 245–281.

[5] G. Janelidze and W. Tholen, Facets of descent II, *Applied Categ. Structures* 5 (1997), no. 3, 229–248.

[6] F. Lucatelli Nunes, Pseudo-Kan Extensions and Descent Theory, *Theory and Applications of Categories* 33 (2018), no. 15, pp 390–444.

[7] R. Street, Categorical and combinatorial aspects of descent theory, *Applied Categ. Structures* 12 (2004), no. 5-6, 537–576.

[8] R. Street, Limits indexed by category-valued 2-functors, *J. Pure Appl. Algebra* 8 (1976), no. 2, 149–181.

[9] R. Street, Fibrations in bicategories, *Cahiers Topologie Géom. Différentielle* 21 (1980), no. 2, 111–160.