Introduction to manifold calculus

Talk at the GeMAT seminar, IMAR   ∥   Martin Palmer-Anghel   ∥   6 April 2018

Abstract:

Following on from yesterday's talk, I will describe some different — more homotopy-theoretical — notions of polynomial functor, due originally to Goodwillie and Weiss, for functors taking values in the category of topological spaces instead of an abelian category.

There are many different flavours of this, and I will focus in more detail on the theory of *Manifold calculus*, introduced by T. Goodwillie and M. Weiss in 1999. Most functors of interest in this theory, the main example being $\mathrm{Emb}(-, N)$ — taking a manifold to its space of embeddings into another fixed manifold N —, are not polynomial. Instead, they are often *analytic*, in the sense that they may be well-approximated by polynomial functors analogously to the Taylor expansion of a real analytic function.

Main references:

- M. Weiss, *Embeddings from the point of view of immersion theory : Part I*, Geometry and Topology 3, pp. 67–101 (1999).
- T. G. Goodwillie, M. Weiss, *Embeddings from the point of view of immersion theory : Part II*, Geometry and Topology 3, pp. 103–118 (1999).

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