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Pregroupoids and their enveloping groupoids

Abstract:The notion of *pregroupoid* (or *affinoid space*, Weinstein) is a many-object generalization of the notion of principal fibre bundle, with the structure encoded in terms of one ternary operation. To a principal fibre bundle P, Ehresmann constructed a groupoid PP^{-1} which in some sense is "equivalent" to P. This construction also works for pregroupoids. A pregroupoid does not embed *naturally* in PP^{-1}. But there exists a somewhat bigger canonical 'enveloping' groupoid P^+ (roughly, P^+ is four times the size of PP^{-1}), in which P embeds naturally. In fact the embedding $P \hookrightarrow P^+$ is the unit for a pair of adjoint functors between the categories of pregroupoids and groupoids.

A special case of pregroupoids are pregroups, which have been studied (under various names, e.g. *Schar*), by Prüfer, Baer, Certaine, Vagner, and others.

We shall consider in particular the differentiable case.