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Étale groupoids as germ groupoids and their extensions

Every étale topological groupoid G gives rise to an inverse semigroup (collection of open local sections of G). This semigroup is naturally equipped with a full representation on the space of units of G. The germs of such representation can be given the structure of an étale groupoid which turns out to be isomorphic to G.

We extend this construction to unital representations of inverse monoids and, more generally, to 'wide' inverse semigroups over a topological space, which allows one to effectively construct éetale groupoid extensions by extending or modifying the underying inverse semigroup.

Two applications of such technique are of particular interest: the Stone-Čech compactification of the unit space of the given groupoid, which resembles some elements of the translation groupoid of Skandalis, Tu, and Yu (but without restriction to the discrete case) and the patch topology extension, which imitates Paterson's universal groupoid without irrelevant restrictions pertaining to the unit space.

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