A shape topology for the universal path space

Álvaro Sánchez-González

Complutense University of Madrid, Spain
`alvarosanchezgonzalez@mat.ucm.es`

The talk is based on joint work with Andreas Zastrow

Session: 37. Wild algebraic and geometric topology

The idea to generalize covering-space theory beyond the class of semilocally simply connected spaces is fairly old, and apparently the first paper making already a suggestion in this direction is from the sixties. Various non-equivalent definitions for generalized covering spaces have been suggested, depending on which properties of classical covering spaces should been maintained and which can be given up. One of the concepts is the idea to use in principle the same construction as in the classical case via the "universal path space" [?], but being happy with covering spaces satisfying weaker conditions. Even for this concept of generalizing covering spaces different propositions for how to define the topology on the covering spaces have been made, which in the classical locally path-connected and semilocally simply connected case all give the topology of the classical covering spaces.

By extending some definitions which have in literature up to this moment only been made for topologizing the topological fundamental group to the universal path space, we are aware of up to five different definitions of topologies on the universal path space to obtain generalized covering spaces. The talk will mainly describe one way for topologizing the universal path space that has its origin in some construction from shape-theory. We also compare this new topology with others that were already defined in order to generalize classical covering space theory to not so well-behaved spaces, in particular those from [?] and [?].

References

[1] W. A. Bogley, A. J. Sieradski: *Universal path spaces*, preprint; http://oregonstate.edu/ bogleyw/.

[2] N. Brodsky, J. Dydak, B. Labuz, A. Mitra, *Covering maps for locally path connected spaces*, Fundamenta Mathematicae 218 (2012).

[3] Ž. Virk, A. Zastrow: *The comparison of topologies related to various concepts of generalized covering spaces*, Topology and its Applications, 170 (2014) 52–62.