Classifications coarser than shape

Nikica Uglešić

*Department of Transport and Maritime Studies, University of of Zadar, Croatia, E-mail: nuglesic@unizd.hr*

Abstract

About thirty years ago, in the time of an intensive study of the shape theory, several classifications of metric compacta coarser than shape were introduced. Two of them have been of a special interest: The quasi-equivalence (K. Borsuk, 1976, [1]) and the $S$-equivalence (S. Mardešić, 1978, [8]). The first one was based on idea of a quantitative estimation of a difference between the shape types of a pair of very “alike” compacta. A recent result, however, has shown that this relation, in general, is not a classification (it is not transitive, [5]). Nevertheless, it still generates an important and useful equivalence relation on compacta. The second one was introduced related to the problem of the shape types of fibres of a shape fibration, [2], [8], [9]. The fact is that all the fibres of a shape fibration (over a continuum) are mutually $S$-equivalent [8], while they need not to be of the same shape type, [6], [4].

In the last decade a much deeper view into these relations has been achieved. Namely, in attempt to characterize or at least describe them in a category framework on purpose of easier operative studying, several new classifications and new “shape” theories occurred. The most interesting are as follows:

- $\mathcal{F}$-equivalence and $q^*$-equivalence (of compacta or category sequences) together with the appropriate theories modeled on the constructed categories and functors, [12];
- $S^*$-equivalence (of compacta) with the corresponding theory - a category and a functor related to the shape category, [11];
- $S^*$-equivalence (of compacta), with a graded sequence of categories $S_*(n)$ and functors, [13];
- coarse shape theory - abstract and standard (for topological spaces), [7];
- weak shape theory - abstract and standard, [15];
- $S_0 \ll S_0^+ \ll \cdots \ll S_n \ll S_n^+ \ll \cdots \ll S \ll S^* \ll Sh$ which is a sequence of classifications (of compacta or category sequences) including appropriate category descriptions, [14], [3].

This lecture is intended to be an exhaustive survey of the above classifications, their mutual relations and the most important results.
References


