The generic continuum approximated by finite graphs with confluent epimorphisms

Aleksandra Kwiatkowska

kwiatkoa@uni-muenster.de

Irwin and Solecki introduced a projective Fraïssé limit, a dual concept to the (injective) Fraïssé limit from model theory, which they used to construct the pseudo-arc. For this they considered the class of finite linear (combinatorial) graphs together with epimorphisms preserving the edge relation, and showed that the topological realization of its Fraïssé limit is the pseudo-arc. Later on, several other known continua were constructed as topological realizations of topological graphs obtained as projective Fraïssé limits of appropriate classes of finite graphs with epimorphisms. Examples include the Lelek fan (Bartošová and Kwiatkowska) and the Menger curve (Panagiotopoulos and Solecki).

We show that finite connected graphs with confluent epimorphism form a projective Fraïssé class and we investigate the continuum obtained as the topological realization of its projective Fraïssé limit. We show that this continuum is indecomposable, but not hereditarily indecomposable, as arc-components are dense. It is one-dimensional, pointwise self-homeomorphic, but not homogeneous, and each point is the top of the Cantor fan. Moreover, it is hereditarily unicoherent, in particular, it does not embed a circle; however, it embeds a solenoid and the pseudo-arc.

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