

Dynamic Constructivism and Positive Topology: motivations, achievements, and prospects

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Abstract

The origins of Dynamic Constructivism and Positive Topology date back to the 1980s, with intuitionistic type theory and formal topology. The main motivation has always been to show that mathematics can be entirely grounded in a human process free of any supernatural assumptions (nothing “we have to believe in”).

The achievements include, first of all, showing concretely that this is possible. The starting point is to adopt a mindset in which no truth is given in advance, and the goal is to manage humanly acquired information as accurately as possible. Genuinely pursuing this in mathematical practice brings to light clear and deep structures, previously concealed by classical ideology; the central role of topology in foundations is thus made evident. It also leads to important new results, such as the embedding of point-set topology into point-free topology (under the appropriate definitions).

The prospects are, on one hand, highly theoretical, namely to show through facts that all of science, including its “queen”, can be developed within a dynamic, evolutionary, human-centred framework, and, on the other hand, highly practical, namely the fruitful application of the mathematical treatment of information in fields where this can be crucial, such as computer science and artificial intelligence.