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Comonads as spaces

Comonads on \mathbf{Set} generalize both categories and topological spaces. We characterize topological spaces as precisely the density comonads of diagrams of subsets of some set, i.e. topological subbases. Following Garner's work on ionads, we develop aspects of the theory of topological spaces for arbitrary comonads on arbitrary categories, including notions of basis, subbasis, continuous map, and specialization. Continuous maps and ordinary comonad morphisms form a double category, which in the case of comonads on \mathbf{Set} corresponding to categories recovers the double category of functors and retrifunctors of Clarke and Di Meglio. Joint work with Kevin Carlson and David Spivak.