1167-57-201 **Frank H Lutz*** (`lutz@math.tu-berlin.de`), Institute of Mathematics, TU Berlin, 10623 Berlin, Germany. *Random simple-homotopy theory.* Preliminary report.

A standard task in topology is to simplify a given finite presentation of a topological space. Bistellar flips allow to search for vertex-minimal triangulations of surfaces or higher-dimensional manifolds, and elementary collapses are often used to reduce a simplicial complex in size and potentially in dimension. Simple-homotopy theory, as introduced by Whitehead in 1939, generalizes both concepts.

We take on a random approach to simple-homotopy theory and present a heuristic algorithm to combinatorially deform non-collapsible, but contractible complexes (such as triangulations of the dunce hat, Bing's house or non-collapsible balls that contain short knots) to a point. The procedure also allows to find substructures in complexes (e.g. surfaces in higher-dimensional manifolds or subcomplexes with torsion in lens spaces).

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