Car Crashes and Algebraic Topology

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Abstract

The computation of the second homotopy group (π_2) of a two-dimensional CW complex is rather more complicated than the computation of the first homotopy group. Certain labelled oriented graphs on the sphere are quite relevant in the computation of π_2. As a result interesting properties of such graphs can be exploited. One quaint property, discovered by Anton A. Klyachko, involves the crashing of cars driving on the graph, and was used to settle an outstanding problem in the theory of equations over groups. The speaker hopes to introduce Klyachko's Car Crash Lemma and discuss applications.