Which groups have polynomial geodesic growth?

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Abstract

The growth function of a finitely generated group is a powerful and well-studied invariant. Gromov's celebrated theorem states that a group has a polynomial growth function if and only if the group is *virtually nilpotent*.

I am interested in a variant called the *geodesic growth function* which counts the number of minimal-length words in a group with respect to some finite generating set. I will explain progress made towards an analogue of Gromov's theorem in this case. I will start by defining all of the terms used in this abstract (finitely generated group; growth function; virtual property of a group; nilpotent) with the hope to make the presentation as accessible as possible to a broad audience.

The talk is based on the papers `arxiv:2007.06834`, `1908.07294` and `1009.5051` by myself, Alex Bishop, Martin Brisdon, José Burillo and Zoran Šunić.

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