Einladung zur öffentlichen Defensio

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Thema der Dissertation

Quasi-Isometries for two-dimensional Right-Angled Coxeter Groups

Abstract:

The Quasi-Isometry Problem is a fundamental problem in the field of geometric group theory. It asks whether or not two given groups share the same large-scale geometry and it has been investigated for many classes of groups. Due to its geometric origin, the class of Right-Angled Coxeter groups (RACGs), introduced by Coxeter, has received a lot of attention. However, their Quasi-Isometry Problem has only been investigated under additional strong assumptions like hyperbolicity or planarity of the defining graph. In the present thesis, we advance the Quasi-Isometry Problem for a large class of two-dimensional RACGs. In particular, we focus on two specifications of the problem: Finding quasi-isometries within the class of RACGs and between RACGs and the closely related Right-Angled Artin groups (RAAGs).

In Section 1, we give an overview of the status quo of the problem.

Our tools of choice to address this problem are the JSJ tree of cylinders and the maximal product region graph. These two decompositions of groups are introduced in Section 2. Section 3, provides the visual construction of the JSJ tree of cylinders of RACGs and establishes it as quasi-isometry-invariant by the use of the structure invariant of Cashen-Martin. In addition, we show that under a certain additional assumption the quasi-isometry-invariant is a complete quasi-isometry-invariant for a certain class of RACGs. It is used to provide new examples of non-hyperbolic RACGs that are quasi-isometric but not commensurable.

In Section 4, the difference between RACGs and RAAGs up to quasi-isometry is investigated. The Dani-Levcovitz construction for finite index visual RAAG subgroups of RACGs is introduced and their algorithm is improved. Then, by use of the structure invariant as well as the maximal product region graph, new techniques are developed to find RACGs that are not quasi-isometric to any RAAG.

Prüfungssenat

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