

## Embeddability between RAAGs I

- CAT(0) geometry

## Embeddability between RAAGs II

- extension graph

## Embeddability between RAAGs III

- application to braids

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In the first lecture, we review basic combinatorial and geometric group theoretic aspects of right-angled Artin groups (RAAGs). We will describe how CAT(0) geometry is used to embed interesting subgroups in right-angled Artin groups, following Haglund and Wise. This lecture will be largely expository.

In the second lecture, we introduce a different method of constructing RAAGs embedded in RAAGs. This method uses a locally infinite graph, called an extension graph. We illustrate a parallelism between the mapping class group action on the curve complex and the natural RAAG action on this extension graph.

In the third lecture, we introduce yet another method of constructing RAAG subgroups of RAAGs. This is in some sense orthogonal to the method described in the second lecture. We also give a motivation and the key ideas of the proof. As an application, we prove that every RAAG embeds into some braid group and also into the area-preserving diffeomorphism groups of the sphere and of the disk. These latter facts answer questions due to Crisp-Wiest and M. Kapovich.