

RESEARCH DESCRIPTION

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Relatively hyperbolic groups. Motivating examples of relatively hyperbolic groups include fundamental groups of finite volume hyperbolic or negatively curved manifolds, fundamental groups of non-geometric 3-manifolds, limit groups, etc.

I am interested in geometric properties of relatively hyperbolic groups. In particular I am interested in their boundaries at infinity, which John MacKay and I used to obtain results about quasi-isometric embeddings of the hyperbolic plane in relatively hyperbolic groups and quasi-isometric embeddings of relatively hyperbolic groups in products of trees.

Random walks. I am also interested in random walks, mostly on groups containing hyperbolically embedded subgroups, as defined by Dahmani, Guirardel and Osin. Developing another approach to such groups, I defined a notion of (weakly) contracting element of a group. Examples include hyperbolic elements in relatively hyperbolic groups, pseudo-Anosovs in mapping class groups, iwips in $Out(F_n)$, rank one isometries in groups acting properly on proper $CAT(0)$ spaces.

I showed that, informally speaking, random walks asymptotically almost surely end up on contracting elements.

I also studied how much random walks can stray far from a geodesic connecting its endpoints, obtaining results for relatively hyperbolic groups and mapping class groups.