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The mysterious connection between proximal actions and Poisson boundaries

An action of a discrete group G on a compact Hausdorff space X is said to be *proximal* if for every two points $x, y \in X$ there is a net $g_\alpha \in G$ such that $\lim g_\alpha x = \lim g_\alpha y$, and *strongly proximal* if the natural action of G on the space $P(X)$ of probability measures on X is proximal. G is said to be *strongly amenable* if all of its proximal actions have a fixed point and *amenable* if all of its strongly proximal actions have a fixed point.

In this talk, I will present relations between some fundamental operator theoretic concepts to proximal and strongly proximal actions, and hence to strongly amenable and amenable groups. In particular, I will focus on the C^* -algebra of continuous functions over the universal minimal proximal G -action and characterize it in the category of G -operator-systems. I will then present some connections to the Poisson boundaries of G . The talk is based on joint work with Matthew Kennedy and Sven Raum.