Groupoids in higher index problems

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Abstract

The groupoid techniques in higher index problems associated with coarse geometry were first introduced by Skandalis, Tu and Yu. It was shown that for any uniformly discrete metric space of bounded geometry X, there is a groupoid, denoted $G(X)$, that encodes the coarse Baum-Connes assembly map of X as a groupoid Baum-Connes assembly map for $G(X)$. In these lectures, we shall introduce the construction of $G(X)$, identify its C^*-algebra with the (uniform) Roe algebra, and discuss some recent developments and applications.