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Graph Groupoids and Their Topology
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This talk investigates graph groupoids and the path spaces associated with their unit spaces. It was shown that for a general directed graph \mathcal{E} , the path space $X = Y \cup Z$, where Y is the set of finite paths and Z the set of infinite paths in \mathcal{E} , is a locally compact metric space. Three main questions are solved. For the first, a natural question that was asked by A. Kumjian in the case of the Cuntz graph \mathcal{E}^∞ was how the topological space X relates to an earlier topological space investigated by J. Renault (Orléans). I show that the two topological spaces are homeomorphic and so can be identified. The talk then discusses the graph groupoid for \mathcal{E} in the general case. For this investigation, it is important to be able to use the axiomatic approach to groupoids, and I show that this is equivalent to the usual definition of a groupoid as a “small category with inverses”. This proof of this equivalence answers the second main question. The third is to construct the graph groupoid $G_{\mathcal{E}}$ for \mathcal{E} and prove that it is a second countable, locally compact, Hausdorff groupoid.