

Functorial Constructions for Graph Algebras

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The celebrated Gelfand-Naimark Theorem states that the category of compact Hausdorff topological spaces is equivalent to the opposite category of commutative unital C^* -algebras. Topological constructions such as obtaining the sphere by gluing two discs (corresponding to the northern and southern hemispheres) along their boundaries (the equator) or obtaining the real projective space as the quotient of a sphere by antipodal identification, have their counterparts in contravariant C^* -algebra constructions. We present noncommutative (algebraic) analogues of these constructions via dense finitely generated subalgebras, (co)functorially. The cofunctor $L_{\mathbb{F}}$ assigns to each digraph Γ its Leavitt path algebra $L_{\mathbb{F}}(\Gamma)$ with coefficients in the field \mathbb{F} .

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