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Interval maps and graph algebras

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Abstract

I will explain the rich interplay between interval maps and C^* -algebras. We look for a suitable C^* -algebra that we can associate to the underlying dynamical system and represent this algebra on the Hilbert space H_x associated to the orbit a point x . For example, if $f(x) = nx \pmod{1}$ then its transition matrix A_f is the $n \times n$ full matrix, and our framework recovers the famous Bratteli-Jorgensen representations of the Cuntz algebra $\mathcal{O}_n$.

If the Markov interval map f has escape points (open dynamics) then instead of the classical transition matrix A_f , we propose another matrix $\hat{A}_f$ that not only encapsulates the transitions among the Markov subintervals but also the transitions to escape subintervals. We show that $\hat{A}_f$ is a topological conjugacy invariant and characterize the matrices that can be attained as $\hat{A}_f$ of some interval map f . For each point x , we produce a representation π_x of the graph algebra $C^*(\mathcal{G}_{A_f}, V_x)$ associated to the directed graph $\mathcal{G}_{A_f}$ and carefully chosen vertex set V_x , and study the family $(\pi_x)_{x \in I}$.

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References

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