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IFSs with overlap: families of orthogonal exponentials and invariant measures, Part 2.

In this talk, we will continue our investigation of IFSs on the real line. In particular, let $\tau_0(x) = \lambda x$ and $\tau_1(x) = \lambda(x+1)$, where $\lambda \in (\frac{1}{2}, 1)$. There exist a unique invariant set X_λ and a unique invariant Hutchinson measure μ_λ on X_λ associated with the maps τ_0 and τ_1. It is well-known that X_λ is a compact interval, but very little is known about the measure μ_λ. The "overlap" of the measure—which refers to the fact that the Lebesgue measure of $\tau_0(X_\lambda) \cap \tau_1(X_\lambda)$ is positive—makes the measure hard to study. In this talk, we will consider the measure of the overlap and different ways to compute it.

Joint work with Palle Jorgensen (University of Iowa) and Keri Kornelson (Grinnell College).