# Cantor Sets as Generalized Inverse Limits

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One of the motivating questions in the study of inverse limits is determining which continua and topological spaces can be obtained as inverse limits of either a single bonding function or a sequence of bonding functions. Given an upper semicontinuous function $F : X \to 2^X$, we are interested in characterizing when the generalized inverse limit is a Cantor set. Let $\mathrm{Dom}_n F = \{x \in X : \exists y \in X \text{ such that } x \in F^n(y)\}$ and $\mathrm{Dom}\, F = \bigcap_{n=1}^{\infty} \mathrm{Dom}_n F$. We define a shift space on $\mathrm{Dom}\, F$ and use properties of the shift space to determine whether the generalized inverse limit is Cantor, connecting ideas from both symbolic dynamics and continuum theory. We focus on the cases where $\mathrm{Dom}\, F$ is either finite or countable.
**(joint work with S. Greenwood and J. Kelly)**