

Constructing symbolic dynamics representations via Conley Index theory

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Conley Index theory and related topological techniques may be used in computational studies of dynamical systems to rigorously detect dynamical structures of various stability types. In this talk, I will focus on the application of these techniques to discrete-time systems and will present sample results for the 2-dimensional Henon map and the infinite-dimensional Kot-Schaffer map. These techniques, which often fall under the heading of computer-assisted proofs in dynamics, are currently being adapted and expanded in order to study topics from dynamical systems theory ranging from descriptions of invariant sets in terms of symbolic dynamics, to the construction of Morse decompositions and Lyapunov functions. This talk will cover some work on building symbolic dynamics descriptions and some extensions and alternate directions will be discussed in the talk of W. Kalies.