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A surprising new application of pattern-avoiding permutations to dynamical systems is that they can be used to distinguish random from deterministic time series.

The orbits generated by piecewise monotone maps on one-dimensional intervals always have forbidden patterns, that is, ordered subsequences that do not occur in any orbit. The set of forbidden patterns of such a map is closed under consecutive pattern containment. This implies that, as  $n$  grows, all but an exponentially small fraction of patterns of length  $n$  are forbidden. On the other hand, in a random time series, every pattern appears with some positive probability, which approaches one as the length of the time series increases. These ideas can be used to create tests to distinguish random from pseudo-random dynamics.

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