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Algorithmic Randomness and Pathological Computable Measures. Preliminary report.

Since the early 2000s, a significant amount of work in computability theory has been conducted in the area of algorithmic randomness. The central idea of this area is to consider as random those infinite binary sequences that do not contain any effectively specifiable regularities (where different definitions of randomness correspond to different ways of making “effectively specifiable regularities” precise). This is a natural approach to studying randomness when the underlying probability measure on the collection of sequences is uniform (so that the probability of the occurrence of a 0 is $1/2$). However, I will discuss some recent results that show that when we consider randomness with respect to certain non-uniform computable measures, all sorts of pathological behavior emerges. (Received September 22, 2011)