

Inconstancy of finite and infinite sequences

Jean-Paul Allouche

(CNRS, Math., Équipe Combinatoire et Optimisation,
Université Pierre et Marie Curie)

After surveying several notions of complexity/randomness/chaos/predictability of finite or infinite sequences taking only finitely many values, we introduce the /inconstancy/ of a sequence: this quantity measures how fluctuating the sequence is. Inconstancy is related to an old theorem of Cauchy and Crofton: the average number of intersection points between a curve and a random straight line is equal to twice the length of the curve divided by the perimeter of its convex hull. We compute the inconstancy of classical sequences (such as Sturmian sequences as well as some automatic sequences). We conclude by describing work in progress for possible applications to biology and music.

This talk is based on a paper by the author and L. Maillard-Teyssier available at <http://arxiv.org/abs/0910.1173>.