

Frequencies of letters in some random and deterministic self-descriptive sequences

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Résumé : The Oldenburger–Kolakoski sequence is the only infinite sequence over the alphabet $1,2$ that starts with 1 and is its own run-length encoding. We take a step back from this largely known and studied sequence by introducing a larger family of self-descriptive sequences, for which the choice of the letters written is determined not only by their index, but also by another sequence, namely the directing sequence. This enables us to provide some results on the convergence of the density of 1 's in the resulting sequence. When the directing sequence is an infinite sequence of i.i.d. random variables or a Markov chain, the average densities of letters converge. Moreover, in the case of i.i.d. random variables, we are able to prove that the densities even almost surely converge. We also treat the case of deterministic self-descriptive sequences directed by two periodic sequences.

The presentation will be based on two joint works with Damien Jamet, in collaboration with Chloé Boisson for the first one, and with Shigeki Akiyama and Mai-Linh Trân Công for the second one.