MORTEZ MOHAMMAD-NOORI, Universite Paris XI; Bat. 490, LRI, Universite Paris XI, 91405 Orsay Cedex, France

Dejean's conjecture and Sturmian words

Dejean conjectured that the repetition threshold of a k-letter alphabet is $k/(k-1)$, $k \neq 3, 4$. The history goes back to Thue's famous papers of 1906 and 1912. Values of the repetition threshold for $k < 5$ were found by Thue, Dejean and Pansiot. Moulin-Ollagnier attacked Dejean's conjecture for $5 \leq k \leq 11$. Building on the work of Moulin-Ollagnier, here we propose a method to decide whether a given Sturmian word with quadratic slope validates the conjecture for a given k. We develop this method into a search algorithm for verifying the conjecture for a given k. An implementation of our algorithm gives suitable Sturmian words for $7 \leq k \leq 14$. Moreover, we prove that for $k = 5$, no suitable Sturmian word exists.