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Geometric representation of sequences of complexity $2n+1$. (Représentation géométrique de suites de complexité $2n+1$.) (French) Zbl 0789.28011

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Let A be a finite set and let $\Omega = A^{\mathbb{N}}$ be all of the one sided infinite sequences over A. For any $u \in \Omega$ and $n \in \mathbb{N}$ let $L_n(u)$ be the set of subwords of u of length n ($v \in A^n$ is a subword of u if for some k one has $v_1 = u_{k+1}, \ldots, v_n = u_{k+n}$), and let $p_n(u)$ be the cardinality of $L_n(u)$. The sequence $(p_n(u))$ is called the complexity of u. This paper studies minimal sequences u in Ω of complexity $n+1$ and $2n+1$. The analysis uses the de Bruijn graph of $L_n(u)$ (where two words u, v are connected if for some $a, b \in A$ one has $u = bw$ and $v = wa$). It is shown how all minimal sequences u of complexity $p_n(u) = n+1$ can be described by infinite sequences consisting of two substitutions, and how this leads to (the well-known) isomorphism of the action of the shift on the closed orbit of u with a rotation on the circle. For a class of the sequences of complexity $p_n(u) = 2n+1$ satisfying a regularity condition on their de Bruijn graphs it is shown that these generate closed orbits which are isomorphic to interval exchange transformations with six intervals.

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MSC:

28D05 Measure-preserving transformations
11K50 Metric theory of continued fractions

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