INVARIANT PROPERTIES OF INFORMATIONAL BULKS

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1. Introduction

Many properties of informational bulks are not preserved under recodings (for example, from the binary system to a ternary one) and thus they are not properties of the informational bulk itself, but, rather, they characterize the text which is the bearer of this information. Different texts may contain approximately the same information.

Contrary to such properties, our report dwells on invariant properties of informational bulks, i. e. the properties preserved under recodings of the information bearers. For simplicity of mathematical formulation, infinite sequences of natural numbers will be considered as the information bearers (though only finite ones are of practical importance). The recodings are carried out by computable operators: sequences α and β are equivalent, if $\alpha = F(\beta)$ and $\beta = G(\alpha)$ for some computable operators F and G. Such α and β contain approximately the same information up to the finite description of F and G.

Using methods of the theory of algorithms it is possible to prove the existence of sequences which possess quite exotic properties. For example (see [1], § 13.5), there exist sequences containing "indivisible" information: such α is incomputable and for any incomputable β, if $\beta = F(\alpha)$ for some computable operator F, then β is equivalent to α, i. e. the information in α is infinite and equivalent - up to the (finite) description of the recoding algorithm - to any infinite part of it. It is dubious whether sequences with such properties may exist in reality. And in fact, as it was pointed out in [1], in any combination of computable and random processes (in the sense specified below) the probability of obtaining "indivisible" sequences equals 0. The specificness of the present paper is that we eliminate such properties by means of the notion of an "ignorable" set. A set of sequences A is <u>unattainable</u>, if for any computable operator F and any $\omega \notin A$ it holds $F(\omega) \notin A$. A set of sequences B is called <u>ignorable</u>, if it is contained in