Estimations of entropy measures of the different classes of information sources

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Abstract – **This paper considers the analysis of entropy of the different classes information sources. Formulas are given for the calculation of entropy of different classes information sources.**

Keywords – **entropy, information sources, onechannel onebit, onechannel multilevel, multichannel onebit, multichannel multilevel.**

I. INTRODUCTION

Among tasks solvable at planning and choice necessary power of the distributed computer systems of the real time there is an estimation parameters and structure of informative streams which are formed with information sources (IS).

These tasks decide by the calculation of entropy IS and determination of their properties on the basis analysis of the informative states.

The modern automated computer systems of basilar level are intended for work real-time, which predetermines the necessity of their analysis from point of entropy approach.

II. ENTROPY OF THE DIFFERENT CLASSES IS

In process [1] the resulted classification of IS, which includes followings their types:
– onechannel onebit IS (fig. 1.);

Fig. 1. Structure of onechannel onebit IS

where bi – boole signals ; $b_i \ni 0,1$.

Entropy of onechannel onebit IS:
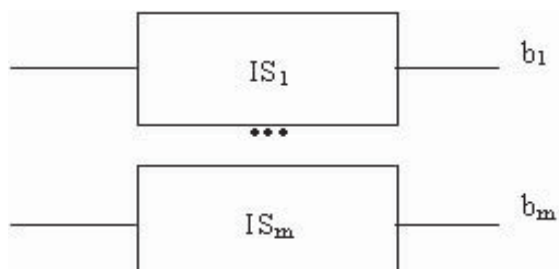
$$I_x = 1\,bit. \tag{1}$$

– onechannel multilevel (fig. 2);

Fig. 2. Structure of onechannel multilevel IS

Entropy of onechannel multilevel IS:
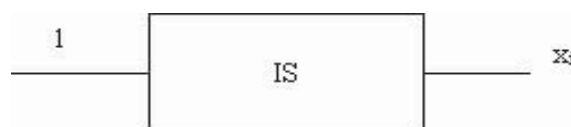
$$I_x = \sum b_i\,bit. \tag{2}$$

– multichannel onebit (fig. 3);

Fig. 3. Structure of multichannel onebit IS

where xi – code signals, $0 \le x_i \le A$

Entropy of multichannel onebit IS [2]:

$$I_x = \hat{E}\big[\log_2 A\big]\,bit. \tag{3}$$

– multichannel multilevel (fig. 4).
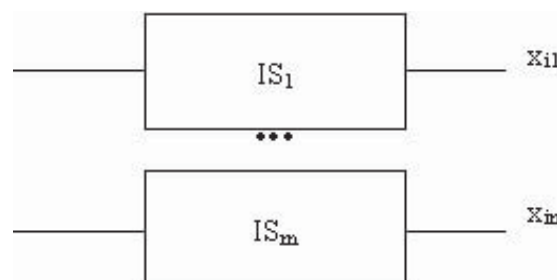

Fig. 4. Structure of multichannel multilevel IS

Entropy of multichannel multilevel IS:

$$I_x = \sum_{j=1}^{m} \hat{E}\big[\log_2 A_j\big]\,bit. \tag{4}$$

III. CONCLUSION

The property of different classes of SI can be described whith entropy models. By the class of SI, which most full answers computer of the basilar distributed systems there is multichannel onebit SI.

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