ENCODING IN THE PROCESS OF PROGRESSING HIERARCHICAL COMPRESSION OF IMAGES WITHOUT LOSSES

Andrey Bomba[1], Alexander Shportko[2], Lesya Shportko[3]
[1]Department of Informatics and Applied Mathematics, Rivne State Humanitarian University
[2]Department of Economic Cybernetics, Rivne State Humanitarian University
[3]SHEE the "Rivne College of Economy and Business

A method and proper algorithms of the use of the arithmetic encoding in the process of progressing hierarchical compression of images without losses are discussed in the research, the predictions for the separated encoding of groups of elements with highest probability and design of relative frequencies of elements after application of predictors are explored. The implementation of the proposed approaches instead of encoding of Huffman, for example, enables us to decrease the aspect of images of the set of ACT ratios on average by 2.13 % without application of context-depended algorithms.

Conclusions:

1. In the formats of graphic files, byte-oriented arithmetic coding with static strategy of forming of intervals of elements is an effective alternative the code of Huffman. For realization of such code, the structure of ARIC is taken into account. In the compressed blocks it is necessary to provide separated storage of arithmetic codes of every division.

2. To implement static strategy of forming intervals of elements of ARIC in the formats of graphic files in the title of every block of the compressed data, it is reasonable to keep the quantity of bits for the record of lengths of intervals, and to keep binary codes of these lengths without the first bit after the title.

3. Data of different layers and passage-ways of a hierarchical round of pixels after the application of predictors of different blocks of ARIC should be squeezed, as they have different entropy. It is reasonable to apply ARIC to the elements directly, without the selection of sequences of identical values. The sizes of small blocks of ARIC can be decreased insignificantly, on condition that only the most credible elements are kept in their given titles, and probabilities of the other elements can be designed by indexes or function.

4. Accelerating decoding of arithmetic codes with the static forming of intervals by more than 40 % enables the use of an auxiliary array in which for every value of generic interval the number of the element corresponding to it is saved.

In future, with the purpose of the subsequent diminishing of AC in the process of progressing hierarchical compression of images without losses, it is planned to develop the methods of the prior diminishing of entropy and adjust the complex-dependent methods of compression for this method of the round of pixels.

Keywords – progressing hierarchical compression of images without losses, arithmetic coding.