

## OPTIMAL RESERVATION OF COMPUTER DATA PROCESSING MEANS BASED ON PROPERTIES OF SYSTEM OF RESIDUAL CLASSES

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Improving the reliability and fault tolerance of operation of information processing today are urgent tasks largely depends on the principles of construction and operation of computer data processing means (CDPM).

It should be noted that, despite the intensive development of modern information technologies used to create hardware and software tools of computer systems (CS), there are still many unsolved scientific and technical problems and problems in this area. First of all, this is due to the following circumstances:

- high requirements, at the same time, as to the performance of data processing, and to the reliability of the operation of CS, operating in real time;
- the limited capabilities of modern CS to carry out in real time simultaneously highly reliable parallel implementation of the computational process [1].

Meeting the above requirements and eliminating these shortcomings is difficult on the basis of well-known, developed and tested methods of data processing based on the use of positional number systems (PNS) [2].

The purpose of the report is to acquaint researchers and developers of CS with some new results of research in the field of creating highly reliable a data processing systems based on the use of system of residual classes (SRC). There are three main properties of SRC: independence of residues, equality of residues, low-order residues. Research has shown that the joint use of the first and second properties of SRC (independence and equality of residues) causes the presence in CDPM simultaneously three main types of reservation: structural, informational and functional [3]. The question of formulation and solution of the problem of optimal reservation of CDPM is considered. The direct and inverse problems of optimal reservation are formulated and solved.

### References

7. Krasnobayev V., Yanko A. and Koshman S. A. Method for arithmetic comparison of data represented in a residue number system. *Cybernetics and Systems Analysis*, vol. 52, Issue 1, 2016, pp. 145–150.
8. Akushskii I.Ya. and Yuditskii D.I. *Machine Arithmetic in Residual Classes* [in Russian], Sov. Radio, Moscow, 1968, 440 p.
9. Koshman S. A., Barsov V. I., Krasnobayev V.A., Yaskova K. V., Derenko N. S. Method of bit-by-bit tabular realization of arithmetic operations in the system of residual classes. *Радіоелектронні і комп'ютерні системи*, № 5 (39), 2009, pp. 44–48.