INFORMATION PROCESSING SYSTEM OF AUTOMATED PROCESS CONTROL SYSTEM WITH ERROR CORRECTION

Yanko A., Krasnobayev V., Lytvyn M.
Poltava National Technical Yuri Kondratyuk University, Poltava, Ukraine

The principles of information processing in the residual classes system (RCS) are formulated in the report. The influence of the basic property of the RCS, namely the independence of the residues on the possibility of constructing self-correcting codes, is conducted [1]. These codes are completely arithmetic, that is, suitable for detecting and correcting errors that occur not only in the transmission of information, but also in its arithmetic processing. For these codes, it has been possible (which has not yet been observed in any known special position code systems) to build a bug fix system with minimal redundancy that uses the dynamics of the information processing system (IPS).

The report clarifies some aspects of the theory of correction codes with mutually non-prime bases [2]. Algorithms for monitoring and correcting errors of information processing system in RCS with mutual in pairs non-prime bases have been developed. Using these algorithms makes it relatively easy to implement a procedure for detecting and correcting one-time errors. The procedures proposed in this report for monitoring, detecting and correcting one-time errors make it possible to localize the erroneous basis and correct the error in one residual in just five conditional time steps for any number of bases of the RCS. Note that by the simplicity of the design of the circuits of the decoding devices of IPS, have no analogues in the positional number systems. This is achieved by limiting the class of possible corrected errors [3]. Thus, this property of RCS makes it possible to implement a unique system of control and correction of errors in the dynamics of the IPS with the introduction of minimal code redundancy without stopping computations, which is important enough for systems that operate in real time.

References

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