Principle of Independence of Continuation of Functions k- Significant Logic From Coding

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Abstract: In this paper we consider not everywhere defined functions of k-valued logic. The problem of logical continuation of functions of k-valued logic in the class of disjunctive normal forms is investigated. We prove a theorem on the invariant extension of functions of k-valued logic in the class of disjunctive norms, which does not depend on the accepted coding. An algorithm is constructed for constructing a set of invariant points that are independent of the received encoding.

Keywords: Encoding, logic, conjunction, disjunction, sets, quasi-Boolean invariant, synthesis, equivalent

We consider the function $F\left(x_1,\, x_2,\, \ldots\,,\, x_n\right)$ k - valued logic, given on $M \subseteq E_k^n$:

$$F(\tilde{x}) = \gamma_j, \text{ if } \tilde{x} \in M_j, \left(j = \overline{0,\ k-1}\right),$$

where $M = \bigcup\limits_{i=0}^{m} M_i$ and $M_i \cap M_j = \emptyset$ for $i \neq j$. We denote by $\{\pi\}$ the set of all permutations of the set $\{0, 1, ..., k-1\}$: $\pi = \left(i_0,\, i_1, ...,\, i_{k-1}\right)$. The functions $F_\pi\left(\tilde{x}\right) = i_j,$ if $\tilde{x} \in M_j,$ $\left(j = \overline{0,\ k-1}\right)$, we call π is a permutation of $F\left(\tilde{x}\right)$. We will say that a point $\tilde{\alpha} \in E_k^n \backslash M$ preserves the encoding (code) of a set $M_j \subseteq M,$ $j = \overline{0,\ k-1}$ with respect to a permutation pi , if $\mathfrak{M}_{\Sigma TF}\left(\tilde{\alpha}\right) = j$ and $\mathfrak{M}_{\Sigma TF_\pi}\left(\tilde{\alpha}\right) = i_j$. A point $\tilde{\alpha} \in E_k^n \backslash M$ is called a point that preserves the encoding of the set $M_j,$ if it preserves the encoding M_j with respect to any permutation $\pi \in \{\pi\}$. Let $\mathfrak{M} = \bigvee\limits_{\pi:\pi\in(\pi)} \mathfrak{M}_{\Sigma TF_\pi}$.

Theorem. The point $\tilde{\alpha} \in E_k^n \backslash \bigcup\limits_{i=0}^{k-1} M_i$ preserves the code of the set M_j, then and only if, when:

1) in DNF $\mathfrak{M}$ there is an EK $\mathfrak{A}$ such that $N_\mathfrak{A} \cap M_j \neq \emptyset,$ $\tilde{\alpha} \in N_\mathfrak{A},$ $N_\mathfrak{A} \cap M_i = \emptyset$, where $\left(i = 0,\, ...,\, j-1,\, j+1,\, ...,\, k-1\right)$;

2) each interval $N_\mathfrak{A}$ where EK $\mathfrak{A}$ belongs to the set $\mathfrak{M}$ intersects with $M_i,$ $(i \neq j)$ and contains the point M_j.

References

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