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Training in structural pattern recognition. (Russian) Zbl 0635.68098
Zh. Vychisl. Mat. Mat. Fiz. 26, No. 11, 1695-1703 (1986).

The training problem on structural objects is investigated. An structural object is a complete oriented graph with labels on every node and arc. These labels are elements of some vector space of features. The case when the number of nodes n is fixed and the labels of arcs have only two values (0 or 1) is considered. Such structures may be defined by a matrix $\tilde{g} = \|g_{ij}\|_{n \times n}$, where $g_{ij} \in \{0, 1\}$. The pattern is the set of objects generating a matrix grammar $GR = (V_N, V_T, P, S)$, $V_N = \{S, B_{11}, \dots, B_{nn}\}$, $V_T = \{0, 1\}$, S the initial symbol, P the set of inference rules, including

$$S \rightarrow \begin{pmatrix} B_{11}, \dots, B_{1n} \\ B_{n1}, \dots, B_{nn} \end{pmatrix} \quad \text{and} \quad B_{ij} \rightarrow g_{ij}.$$

This grammar is defined by some matrix $\tilde{w} = \|w_{ij}\|_{n \times n}$, where $w_{ij} = \{g_{ij} \in \{0, 1\} : B_{ij} \rightarrow g_{ij}\}$.

The training problem on objects and on objects with inserted and/or deleted arcs is formulated as the problem of inference of matrix grammar. The conditions of inferrability of such grammars are given. The complexity of training procedures is discussed.

Reviewer: [N.Huhro](#)

MSC:

[68T10](#) Pattern recognition, speech recognition
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