ABSTRACT

A SPECIAL MATCHING PROBLEM AND AN ALGORITHM FOR IT

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This paper deals with the following problem: Suppose there exist n point sets, N_1, N_2,- - -, N_n, each point p of which has two attribute values A(p) and F(p), where A(p) takes a binary value 'good' or 'bad' and F(p) takes a value of real number given according to some evaluation of p. Then, the problem is to find an interchanging rule so that by repeatedly interchanging attribute values A(p) and F(p) between p_1, $p_2 \varepsilon N (N = \bigcup_{i=1}^{n} N_i)$, the value (1) should be minimized under the condition that the value (2) be maximal:

(1) $\underset{i \varepsilon B}{\text{Max}} \ \underset{p \varepsilon N_i}{\text{Max}} \ |F(p) - \acute{F}(p)|$

(2) Value of $|B|$

where,

(i) $B = \{i \,|\, \acute{A}(p) = \text{'good'} \ {}^{\forall} p \varepsilon N_i\}$

(ii) $\acute{A}(p)$ and $\acute{F}(p)$ are attribute functions modified by interchanging.

In this paper, the authors have developed a theory by which this problem could be handled as a matching problem for a bipartite graph and presented an efficient algorithm for it.

A numerical example and a result of numerical experiment are also given.