

General construction of cluttered orderings and square disk arrays

Tomoko Adachi*, Toho University

The desire to speed up secondary storage systems has led to the development of *disk arrays* which achieve performance through disk parallelism. We can make a model of disk arrays by corresponding an information disk to a vertex and a check disk to an edge.

Let h and t be two positive integers. For each parameter h and t , we define a bipartite graph denoted by $H(h; t) = (U, E)$. Its vertex set U is partitioned into $U = V \cup W$ and consists of the following $2h(t+1)$ vertices: $V := \{v_i | 0 \leq i < h(t+1)\}$, $W := \{w_i | 0 \leq i < h(t+1)\}$. The edge set E is partitioned into $\cup_{0 \leq s < t} E_s$, defined by $E'_s := \{\{v_i, w_j\} | s \cdot h \leq i, j < s \cdot h + h\}$, $E''_s := \{\{v_i, w_{h+j}\} | s \cdot h \leq j \leq i < s \cdot h + h\}$, $E'''_s := \{\{v_{h+i}, w_j\} | s \cdot h \leq i \leq j < s \cdot h + h\}$, $E_s := E'_s \cup E''_s \cup E'''_s$, for $0 \leq s < t$.

Mueller et al. (2005) gave cyclic constructions of $H(1; t)$, $H(2; t)$ and $H(h; 1)$. Adachi and Kikuchi (2015) gave one of $H(3; t)$.

In this talk, we give a construction in the general case of $H(h; t)$, for any positive integers h, t .

Keywords: square disk array, the complete bipartite graph