

- ▶ HIROSHI UMEO, *A New Optimum-Time Firing Squad Synchronization Algorithm for Two-Dimensional Rectangle Arrays.*

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The firing squad synchronization problem on cellular automata has been studied extensively for more than fifty years, and a rich variety of synchronization algorithms have been proposed for not only one-dimensional arrays but two-dimensional arrays. In the present paper, we propose a new optimum-time synchronization algorithm that can synchronize any two-dimensional rectangle array of size $m \times n$ with a general at one corner in $m + n + \max(m, n) - 3$ steps. The algorithm is based on a simple recursive halving marking scheme which helps synchronization operations on two-dimensional arrays. A proposed computer-assisted implementation of the algorithm gives a description of a two-dimensional cellular automaton in terms of a finite 384-state set and a local 112690-rule set.