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Abstract
This paper presents a simulated annealing (SA) approach to solve the thermal placement problem for MCM. SA can avoid getting stuck at a local optimum by applying a stochastically accepted rule. However, the stochastically accepted rules also make this method inefficient. In general, the cost function of the thermal placement problem is the system failure rate that is very difficult to be calculated. This study saves the runtime of SA from two ways. First, the number of algorithm iterations is reduced by a hybrid perturbation that is a mix of a greedy perturbation with the random perturbation. Second, an easy-calculated function, the spreading number of a placement, is replaced the system failure rate as the cost function of the thermal placement. Numerical results prove that these techniques are both effective and efficient. Experiments on three industrial MCMs also show that the placements obtained by the proposed method have significant improvements to their original designs in system reliability.
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