

Cooperative Dynamic Multi-CBJ Search for DisCSPs

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Abstract

A multi search process version of the sequential assignment, distributed Conflict based BackJumping algorithm is presented. Multi-CBJ benefits greatly from sharing of Nogoods among search processes. It also improves when the multi-search process is dynamic, generating CBJ processes during search with a dynamic heuristic that controls load balancing. The resulting algorithm, Cooperative Dynamic Multi-CBJ, is much faster and more efficient than asynchronous algorithms like ABT and AFC. The multi-search version of asynchronous backtracking (ABT) turns out to be unsuccessful. Apparently, the existing asynchronicity of ABT prevents it from benefiting from the use of multi search processes. Its performance actually deteriorates with additional search processes. Finally, the hypothesis that multi - search flourishes when message delays are dominant is checked. Asynchronous multisearch algorithms do perform better in the presence of message delays. However, cooperative dynamic Multi-CBJ remains the best performing multi-search algorithm, also in the presence of message delays.