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Load Balancing
as
Cooperative Problem Solving
in Distributed Artificial Intelligence

SADANCO

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ABSTRACT

In any distributed system, there are processors wherein the computational capacities are too small to meet the processing demands of their users [GOŚC91]. Completion of users' requirements may take enormous amounts of time such that the response time and output of these computations may not be reasonable. One solution to this situation is through balancing the system workload. Load balancing allows remote execution of users' tasks even in the absence of idle processors and at the same time, strives to equalize the system workload among all the processors in a distributed system. Achieving this requires cooperation among processors in the system.

In distributed artificial intelligence (DAI), a model known as the *cooperative problem solving* (CPS) process has been proposed [WOOL94b] for modelling interactions among a group of logically decentralized agents that choose to work together to achieve a common goal. This research presents a load balancing algorithm using the 4 stages that comprise the CPS model. It was shown that the load balancing process is an instance of CPS. A formal model of this algorithm was presented using quantified modal logic. The algorithm performs load balancing globally and takes into consideration the processors' load and resources.



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