

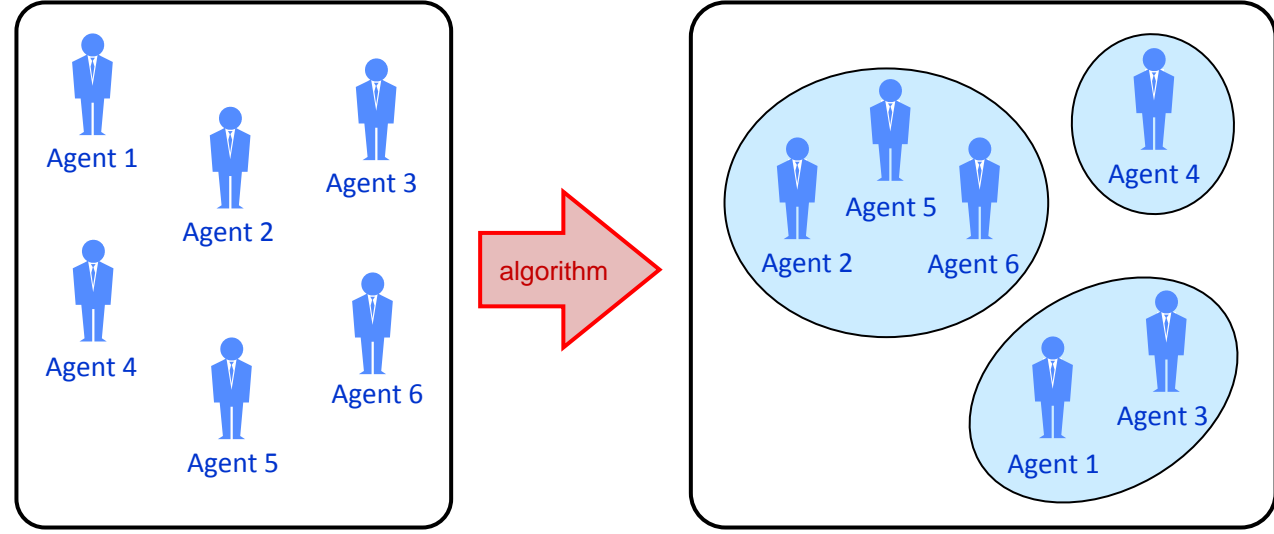
Forming Optimal Teams of Agents

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Aims

An algorithm to compute an optimal, or near optimal, **partition** of the agents into disjoint coalitions



Application

Green energy generators (like wind and solar) can form coalitions to reduce the uncertainty about their generation and sell at higher prices

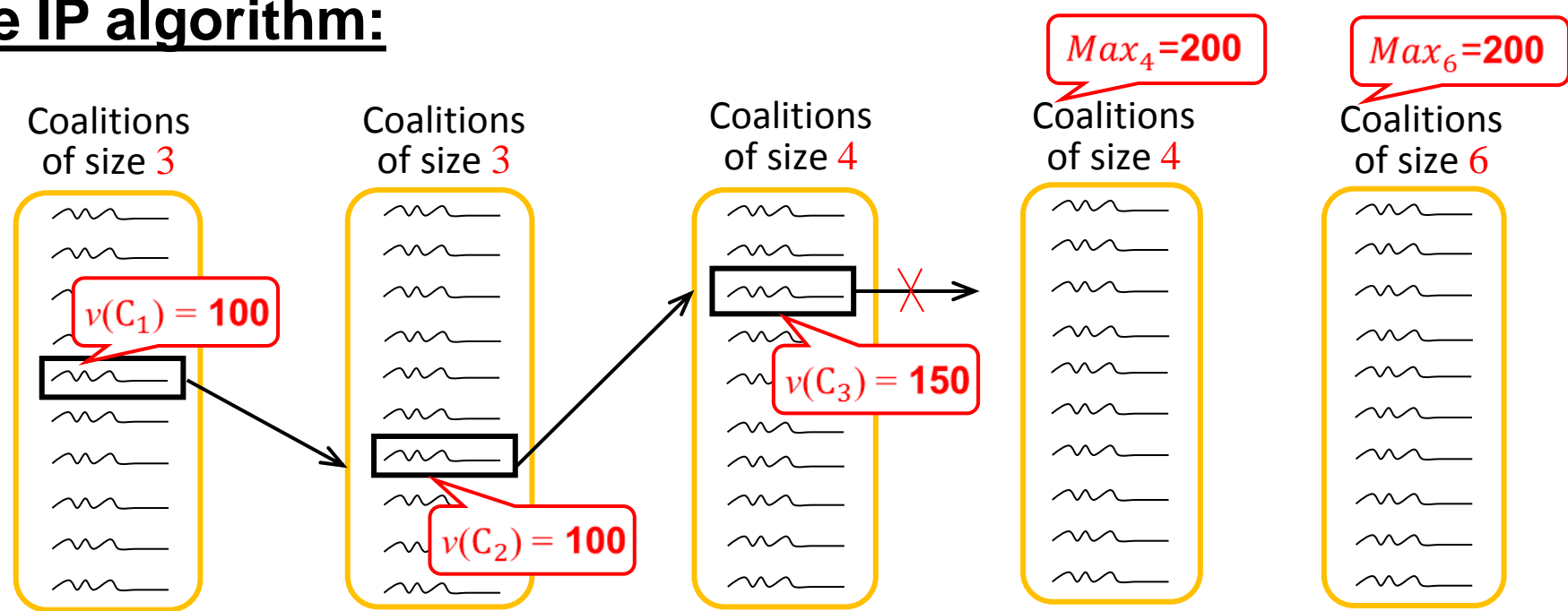


Related Work

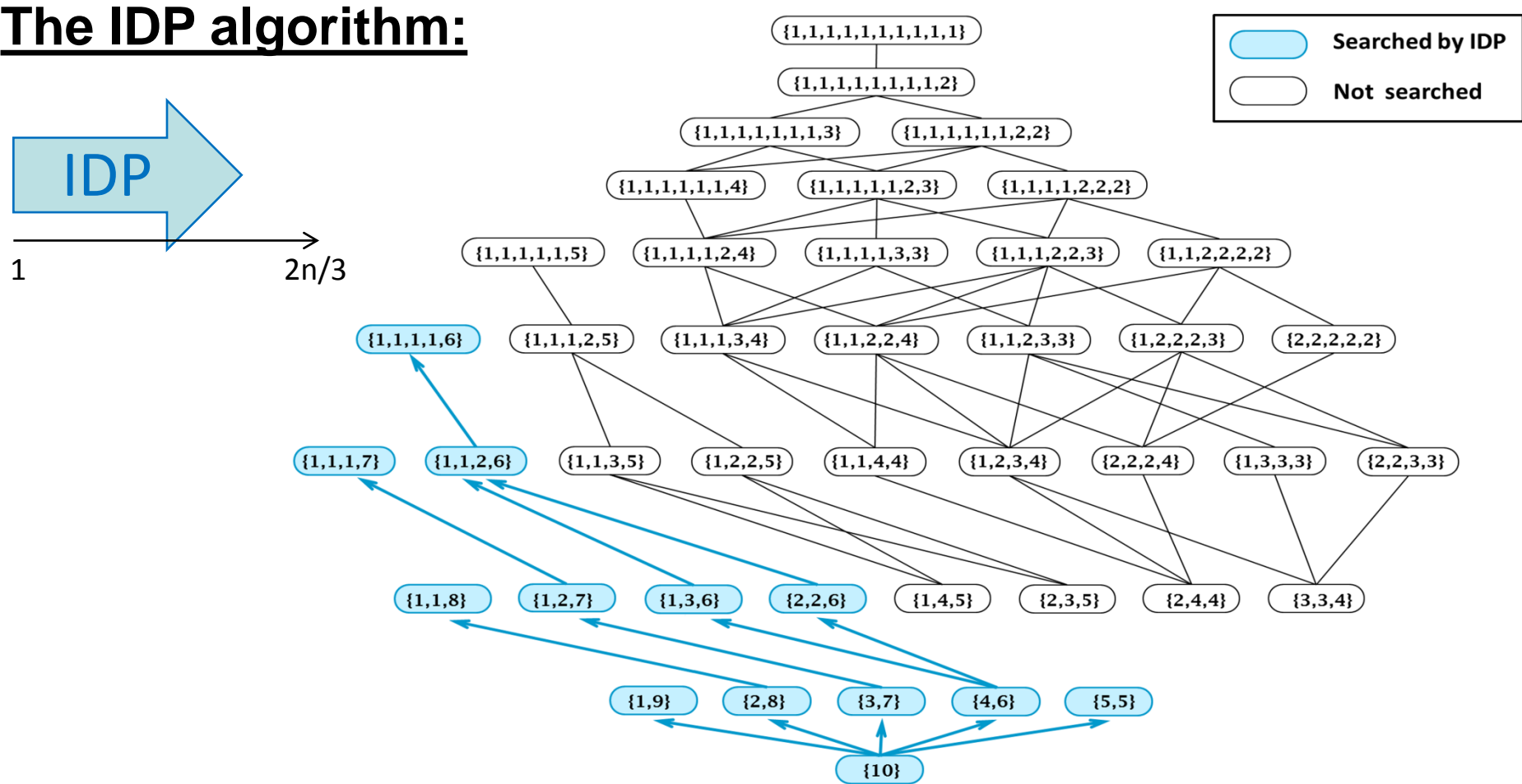
The space of possible partitions is divided into subspaces. Each subspace is represented by the sizes of the coalitions.

Example: Given 20 agents, the subspace: $(3,3,4,4,6)$ contains all partitions in which two coalitions are of size 3, two of size 4, and one of size 6.

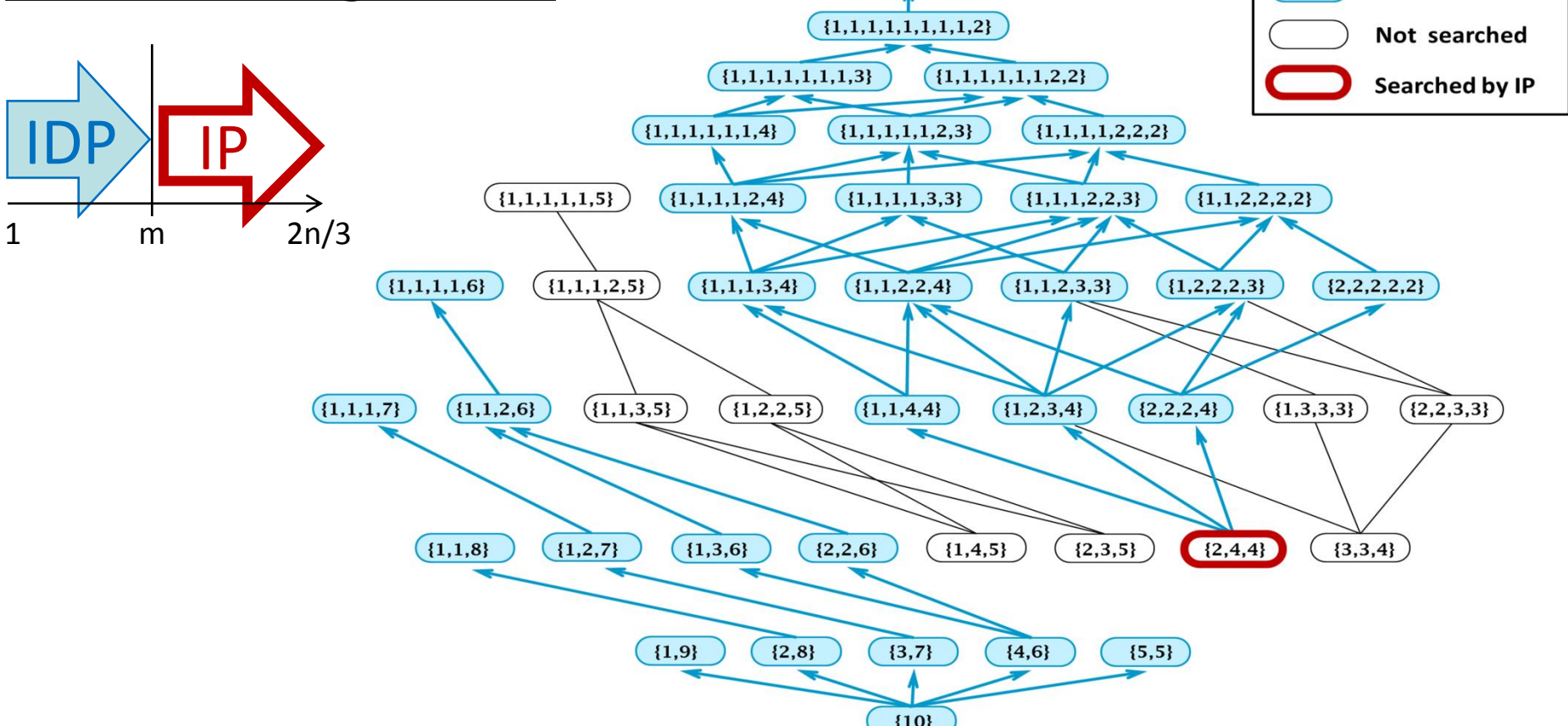
The IP algorithm:



The IDP algorithm:

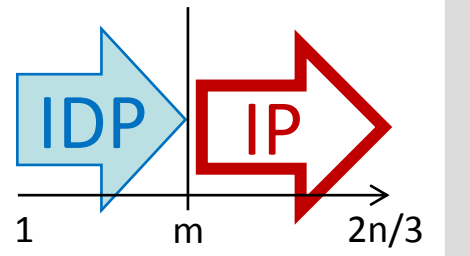


The IDP-IP algorithm:

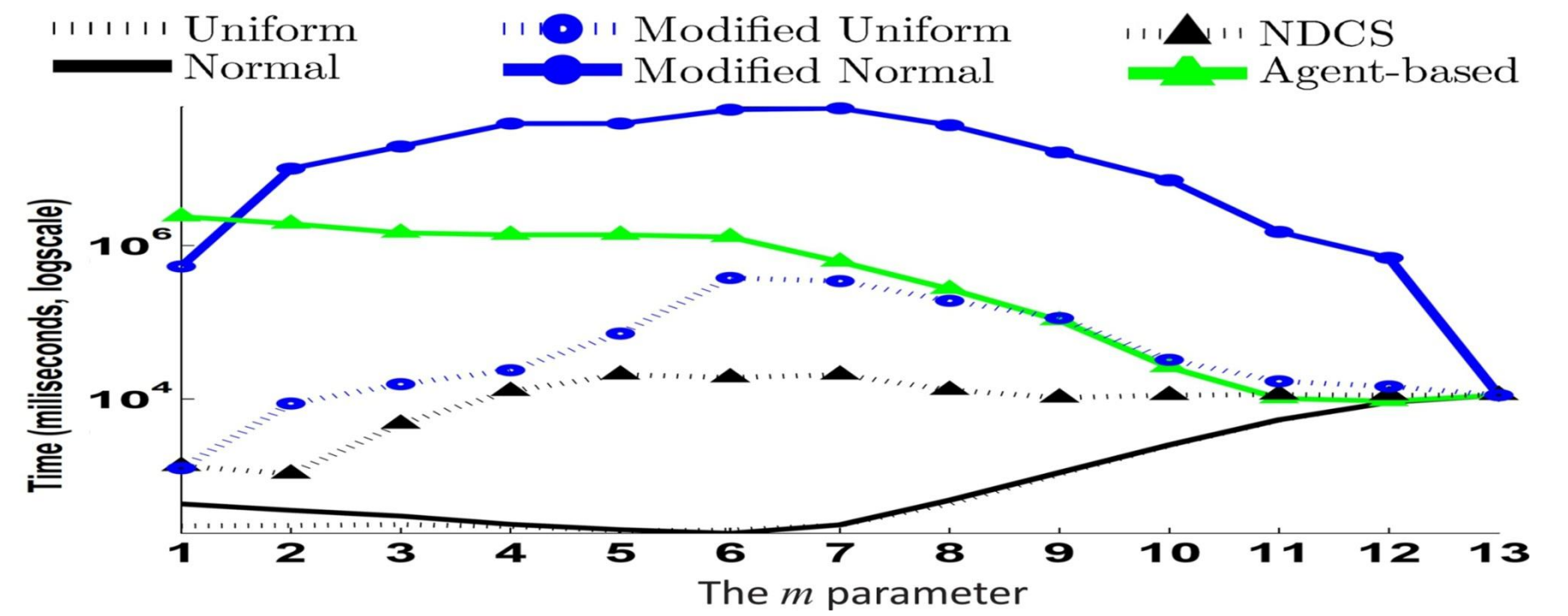


Our Contribution

We show that the performance differs significantly based on m —the parameter that controls the point at which to switch from IDP to IP.

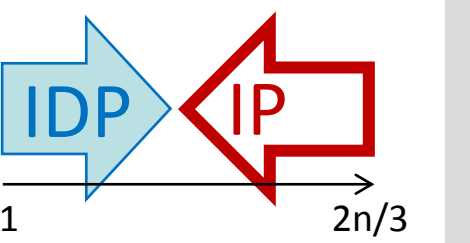


The optimal setting of m is unknown *a priori*

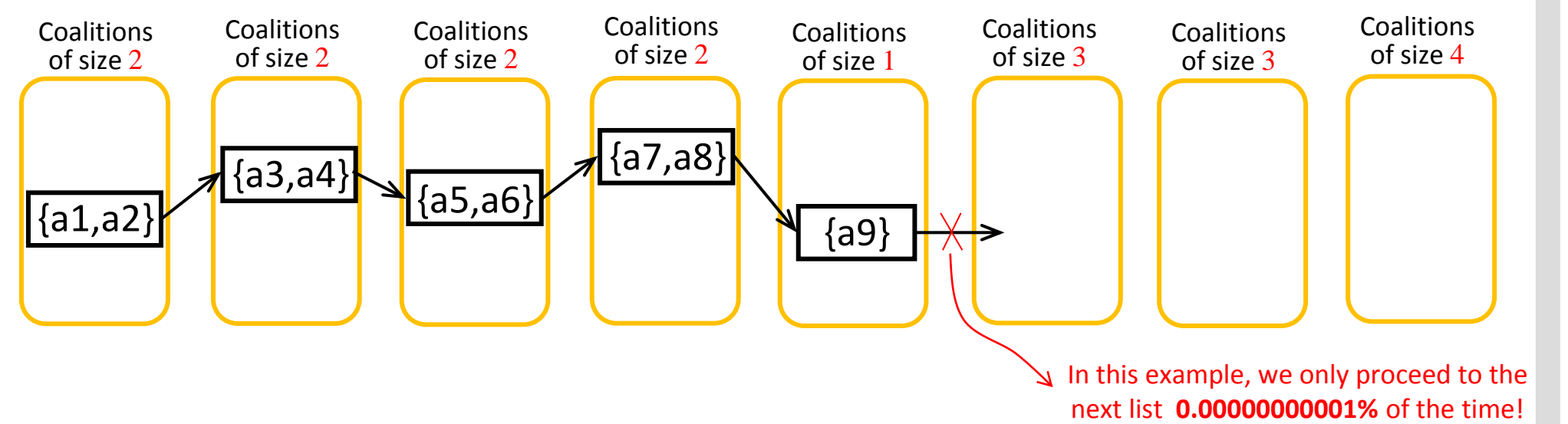


Based on this, we develop **IDP-IP***, with the following advantages:

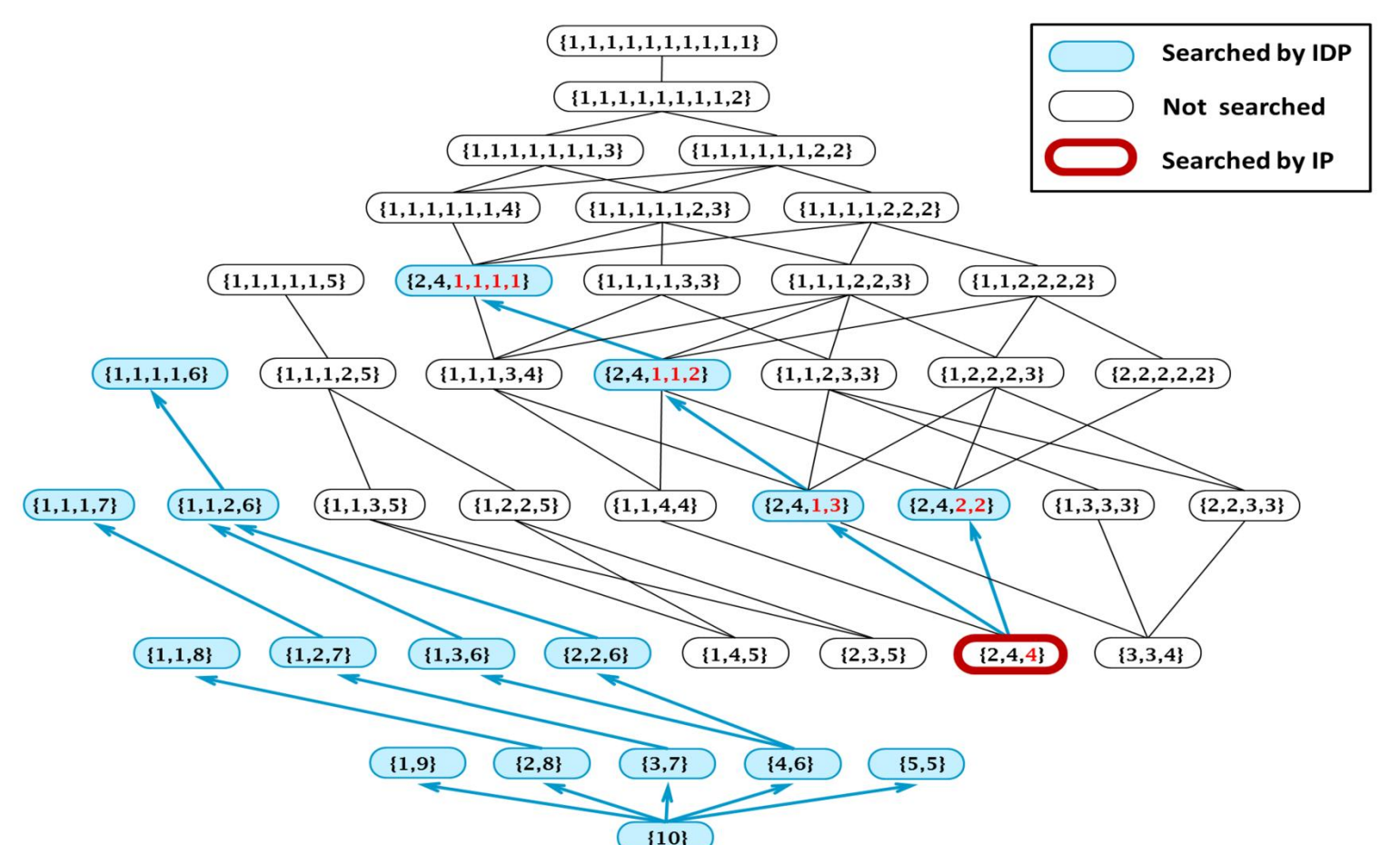
1. It runs IDP and IP simultaneously, where IP is modified to actively help IDP during its search. The algorithm automatically adjusts itself to the optimal setting (no control parameter!)



2. IP is significantly enhanced by the information from IDP, which



3. We show how IDP and IP should help each other in a way that does not compromise the performance of each one individually.



Results

