Discrete Dynamical Systems on Maxterms and Minterms Boolean Functions

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In computer simulations, there are many entities an each entity has a state at a given time. The update of states of the entities constitutes an evolution in time of a system, i.e., a discrete dynamical system. The update of the states is determined by local rules and dependency relations. If the states of the entities are updated in a parallel manner, the system is named a parallel dynamical system (PDS), while if they are updated in a sequential order, the system is named sequential dynamical system (SDS).

Barret et al. demonstrate in [1], with OR and NOR as local functions, that the dynamics is quite easy. For instance, they prove that the PDS and the SDS induced by OR are fixed point systems, while all the orbits are 2-cycles in a PDS induced by NOR. However, as we show in this work, if Maxterms and Minterms are consider as local functions to define the evolution of the systems, the dynamics is more complicated.

References