Memcomputing NP-complete problems in polynomial time using polynomial resources and collective states

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Memcomputing is a new non-Turing paradigm where a memcomputing machine is a network of several computing units, each having its own memory and being aware of the collective state of the machine. Such machines present interesting new properties such as intrinsic parallelism (all computing units can run at the same time), functional polymorphism (computing units can execute different tasks by changing the input, without reworking the network) and finally information overhead (the network organization allows to store more data than the sum of each computing unit memory). Those properties allow memcomputing machines to solve NP-complete problem in polynomial time and resources. This paper offers a network organization for such a machine to solve a well-known NP-complete problem, the subset-sum problem, in polynomial time with polynomial computing units.

Bibliography:

F. L. Traversa and M. Di Ventra. *Universal memcomputing machines.*
F. L. Traversa, C. Ramella, F. Bonani and M. Di Ventra. *Memcopmuting NP-complete problems in polynomial time using polynomial resources and collective states.*