# Reaching Consensus through Probabilistic Polling

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Algorithms for distributed computation in networks have recently attracted considerable interest because of their wide-range of applications in networked systems such as peer-to-peer networks, sensor networks, distributed databases, and on-line social networks. A specific algorithmic problem of interest is the so called majority (binary) consensus where, initially, each node in the network holds one of two states and the goal for each node is to correctly decide which one of the two states was initially held by a majority of nodes. This is to be achieved by a decentralized algorithm where each node maintains its state based on the information exchanged at contacts with other nodes, where the contacts are restricted by the network topology. It is desired to reach a final decision by all nodes that is correct and within small convergence time.

In this talk, we will discuss a number of recent approaches to addressing this problem building on the classical voter model from statistical physics. We will then describe an approach analogous to the distributed averaging problem to solve the majority (binary) consensus and provide theoretical bounds on its time to convergence.