Abstract :

Many of the existing Leader Election algorithms
don't deal with energy consumption and fault tolerance since they
are not mainly dedicated to autonomous systems like wireless
sensor and IoT networks. It is possible to use the classical
Minimum Finding (MinFind) algorithm, where each node sends
its value in a broadcast mode each time a better value is received.
This process is very energy consuming and not realistic since it
may be subject to an important number of collisions. In this
paper, we propose a new algorithm called WBS (Wait-Before-
Starting), which is fault tolerant and where each node in the
network will wait for a certain time before starting the execution
of its program. This time lapse depends on the node's value so
that the leader will be the one which will wait the least. In this
case, the leader will be the first one which will start by sending
a message to all the nodes of the network to inform them that
it is the leader. Then, the other nodes will start the execution
of their programs. Otherwise, if the leader fails, another node
will do the same. The obtained results show that the proposed
algorithm reduces the energy consumption with rates that can
exceed 96% compared with the classical MinFind Algorithm.