

ABSTRACT

Water Pipeline Monitoring Systems have emerged as a reliable solution to maintain the integrity of the water distribution infrastructure. Various emerging technologies such as the Internet of Things, Physical Cyber Systems, and machine to-machine networks are efficiently deployed to build a Structural Health Monitoring of pipeline and invoke the deployment of the Industrial Wireless Sensor Networks (IWSN) technology. Efficient energy consumption is imperatively required to maintain the continuity of the network and to allow an adequate interconnection between sensor nodes deployed in the harsh environment. In this context, the data aggregation techniques are well-designed and various smart algorithms are developed to reduce the quantity of transmitted data and to minimize the energy consumption. In this project, we combine between data aggregation and clustering algorithm in order to improve the WSN lifetime. Data aggregation is applied in order to eliminate redundant data either from different sensor nodes at the same time or from the same sensor node at various time steps. We propose a method named Adaptive-LEACH for the cluster-head selection to ensure that the selected node have residual energy at threshold level to be a head node and the distance to SINK is less, by this the probability of selecting nodes with low energy and poor location as the cluster head is reduced. NS2 simulator tool has been used to evaluate existing and proposed system performance. Then, efficient data aggregation allowing the redundant data elimination at the cluster and sensor node level which improves the throughput, reduces signal delay and energy consumption.