

Base station (BS) positioning is an effective method for improving the performance of wireless sensor networks (WSNs). A metric-aware optimal BS positioning and relocation mechanism for WSNs is proposed. This technique locates the BS with respect to the available resources and the amount of traffic traveling through the sensor nodes. The BS calculates its own position over time in response to the dynamic environment in which the sensor nodes operate. In most WSN environments, communication channel experiences nonlinearity that is influenced by path loss, attenuation of signal as it propagated through space, greater than 2. In this work, we solved the problem of BS positioning in nonlinear environments. We propose a weighted linear or nonlinear least squares optimization depending on the value of the path loss exponent. We also propose a distributed algorithm that can effectively handle the required computation by exploiting node cooperation. The goal is to minimize the total energy consumption and to prolong lifetime of the WSNs. The performance of the proposed technique is evaluated for various network setups and conditions. Our simulation results demonstrate that BS positioning and relocation can significantly improve the lifetime and power efficiency in WSNs.