

ABSTRACT

Currently, positioning is very important because apart from searching for items outdoors, this positioning can also determine the position of a moving object by utilizing differences in signal arrival times at several sensor points. In everyday life, TDOA can be used in various applications such as navigation, cellular communications, and environmental monitoring, searching for victims when natural disasters occur.

There are several solutions to this problem, one of which is using the Time Difference of Arrival (TDoA) technique, a positioning method that uses differences in signal arrival times from several base stations to determine the position of an object outside the room. This method is generally used in global positioning systems such as GPS to obtain accurate coordinates.

In the TDoA technique time synchronization is only required between fixed BSs. Typically, they are connected to a backbone cable, which simplifies synchronization between them. This makes it easier to search for locations compared to other methods. Based on the research carried out, it was found that the TDOA on the BTS (Sensor) can determine the MS target position with the largest error level of 230.03 meters, and the smallest error is 0.185 meters, the running time required to run this TDOA simulation program is between 0.01 to 0.18 seconds, and with The modified TDOA algorithm was able to correct the largest error of 62.14 meters or 72.986% and the smallest was 0.14 meters or 24.324%.

Keywords: *Matlab, Time of Arrival, Time Difference of Arrival, Simulation.*