3. Height holding of an obstacle:

The second task for the copter is to detect its neighbors during the oscillating process. Sonar sensors look for any obstacle or object in a defined search space. Since all four copters are in known environment, which restricts the copters to stay at a defined distance from each other. So the search space for sonars to look for the other copter has been restricted to a total of 30 cm (Range: between 30 cm to 60 cm).

During the vertical oscillation the copter reads its sonars with a frequency of 12HZ, if they have detected any object in the defined horizontal search space . When the sonar reading is positive the copter stops oscillating and tends to stay at its position maintaining the same height as its neighbor. If the reading is negative it keeps oscillating vertically.

Once readings of one sonar are positive and a neighbor is detected, readings to be positive from another sonar sensor are checked with the same frequency(12HZ) in order to find the second neighbor too.

Issue and fix:

Previously readings were read from the sonar sensor at a frequency of 30 HZ that is after every 3.33 mSec. This rate was too fast for the sonar sensor to process. The frequency has been reduced to 12 Hz and readings are taken after every 83 mSec.