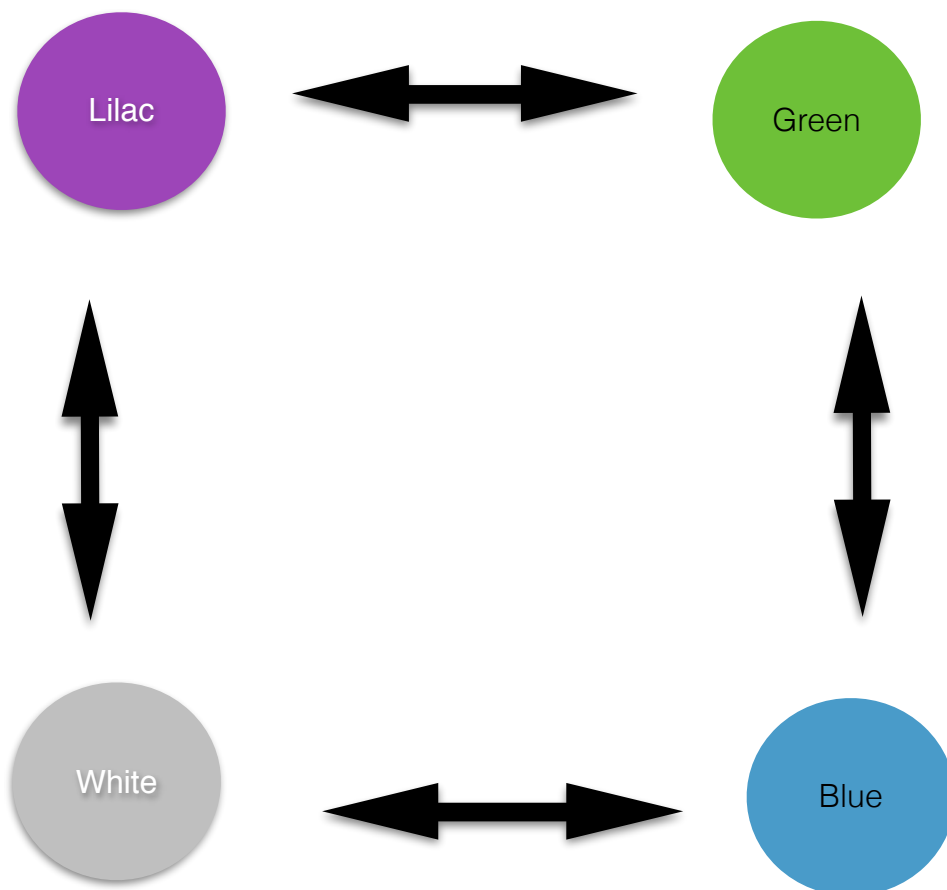


6. Resulting behavior:

The copters almost achieve the expected behavior which is

- 1) Oscillate from 40 cm to 90 cm vertically since the readings of IR sensor are currently accurate in this range
- 2) A horizontal range of 30-60 cm for sonar sensor of under observation copter is defined to detect the neighbor copter
- 3) The task to achieve the swarm behavior of four copters is sub-divided in a way that each copter has to find its two neighbors



- 4) Different states are defined depending upon the no. of neighbors a copter has. State is 0,1 or 2 if the number of neighbors are 0, 1 and 2 respectively
- 5) State 0: Copter oscillates vertically in the defined range in a step wise manner (2.5 cm per sec) and try to detect a neighbor through sonar sensor.
- 6) State 1: If one copter is found these two try to maintain the connection and find the other (2nd neighbor of each) copter too. If the two break the connection, state changes from 1 to 0. From the above figure if Blue finds Green, they should maintain their connection.
- 7) State2 : Once the other copter is found they maintain the height hence the swarm behavior is achieved. From the above example once Green and Blue are aligned Green finds the 2nd neighbor which is Lilac and Blue finds the 2nd neighbor which is White. This results in the alignment of all the four copters. If one copter is lost somehow state changes from 2 to 1 again.

Observation: Once state 2 is achieved the height and swarm behavior should be maintained by the copters indefinitely. Actually, due to different battery levels and consumption of the copters, some times one copter loses the connection yet others again try to find it and the cycle goes on until one of the copters is out of battery and lands.