**Algorithm for Nuke-Clear**

**Detection of arena**

An image of the arena is taken without the bot and white portion is detected and saved in a different image. Similarly red colour is detected and square detection algorithm is applied and co-ordinates of red square is saved after shifting it to the front white portion which is marked as target points. Orange colour is also detected and its centre is stored as finishing point and the area is added to the white portion.

**Bot detection**

Two blue rectangular sheets of different area are pasted on the top-left and top-right of the bot. with the help of the centres of these two, the co-ordinates of the centre of the bot is found.

**Traversing the arena**

The point where the bot is placed is taken as the starting point. The bot moves towards the red objects one by one and diffuse them. After that it is directed towards the safe zone.

**For reaching any target points**

It first checks whether all pixels from bot to target point are white in any one direction, that is along X or Y axis. If the path is easily traceable the bot reaches that point. In case the path is not available in the required direction it moves along the other axis till the path is available in required direction. The X-Y sequence is followed till the bot reaches the target point.

**Following the virtual lane**

For preventing the bot, form touching the black, inaccessible portions. A virtual lane is made between starting point and target points. While moving towards the target point, the bot at one time moves in a single axis. So one co-ordinate of the bot is always same with its end point in that direction. We can draw an imaginary line between the two. Two more imaginary line are drawn each 20 pixels above and below it. The bot calculates the distance of its left co-ordinate from the line made below and the distance of its right co-ordinate from the line above. If the difference between the distance is more than 10 the bot rotates towards the side having larger distance.

**Diffusing the bomb**

Once the bot reaches near a red object, the on-board camera searches for blue colour. The blue colour is divided in three frames. The bot slides till the co-ordinates of its centre reaches the middle frame. Now, it moves forward, presses the button and returns back.

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