

# James Hulme - s0901522

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Performance Review 3 - March 8, 2012

This milestone I started off by creating a technique to consistently get the robot position accurately. I then polished up multiple areas of the vision system providing cleaner and faster code. I also updated the vision testing system to keep it up to date with the recent changes.

- The centroids are now calculated from multiple sub centroids. All the red/yellow/blue points are found. They are split into multiple bins randomly. A centroid is calculated for each bin. Centroids that do not lie on a red/yellow/blue point are discarded. The remaining centroids are averaged to give a final centroid. This provides a similar effect to clustering whilst not suffering from the loss of speed. Initially this was tested by eye and was very effective. I then tested using the testing framework and on 20 tests achieved 79.66% accuracy. The thresholds in the testing framework need adjusting so I would expect the accuracy to rise.
- I sped up the barrel distortion code we are using. Our frame rate went from 8fps to 20fps. This was applied to the whole pitch area. I then made it toggleable, so when turned on it corrects the whole pitch area allowing us to fine tune the distortion correction constants and when off it only corrects the points we care about like positions of robots, so we don't have a drop in speed.
- I used the un-used space on the video feed to display information such as robots distance to ball, distance to each other, speed, direction etc, along with information such as which direction we are shooting. This provides instant feedback to us allowing us to know the GUI has worked. It also means we don't flood the terminal with print statements whenever we want to know where something is.
- I updated the testing framework so it works with the code that has changed in the past few weeks, it also now generates an XML file for clicked locations so we don't have to perform all the clicking whenever we run a test. This means Jenkins can be scripted to run our tests.

Areas that I feel need to be improved on:

- A lot of the magic numbers we've got need to be fine tuned such as the thresholds for testing.
- There are some bugs with orientation finding in the vision system that need to be fixed.
- The code for correcting parallax is written but it needs to be used and tested.

Score: 9

Exceptional Effort: Chris, Dale, David and I.

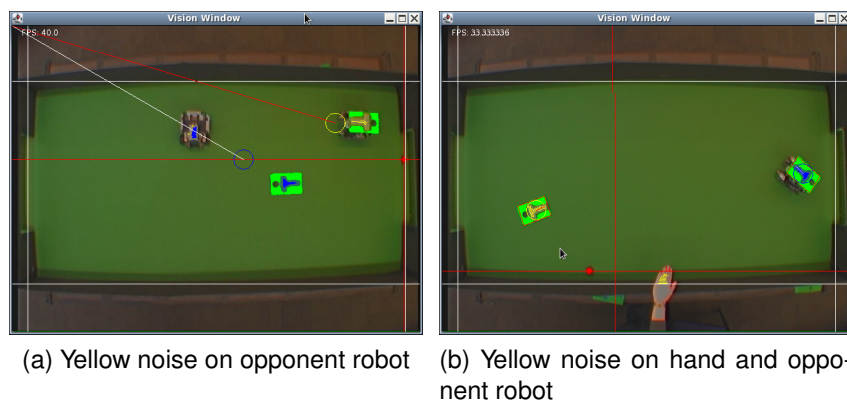


Figure 1: Before and After of multiple centroid technique