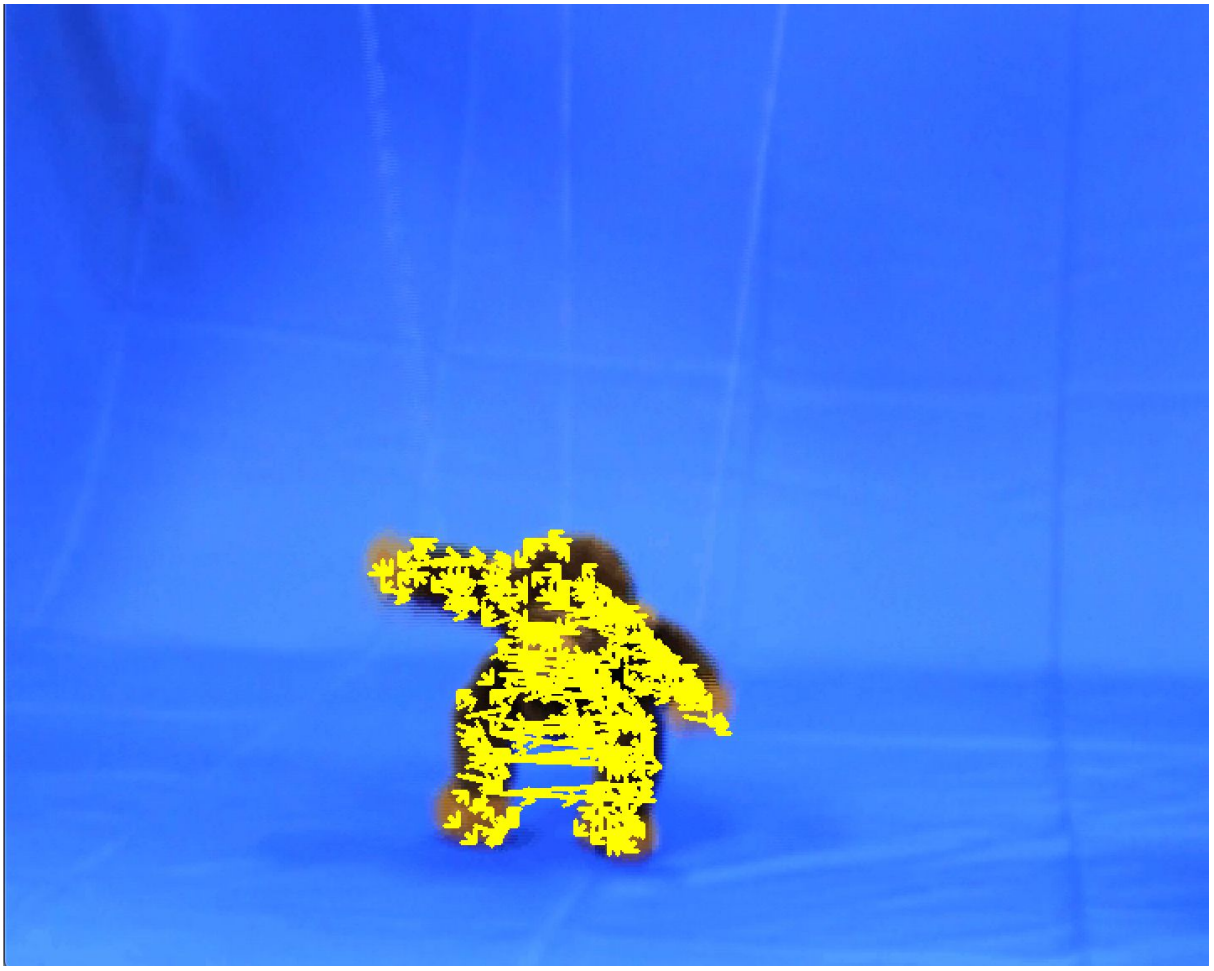
Task A - Motion Estimation and Visualization

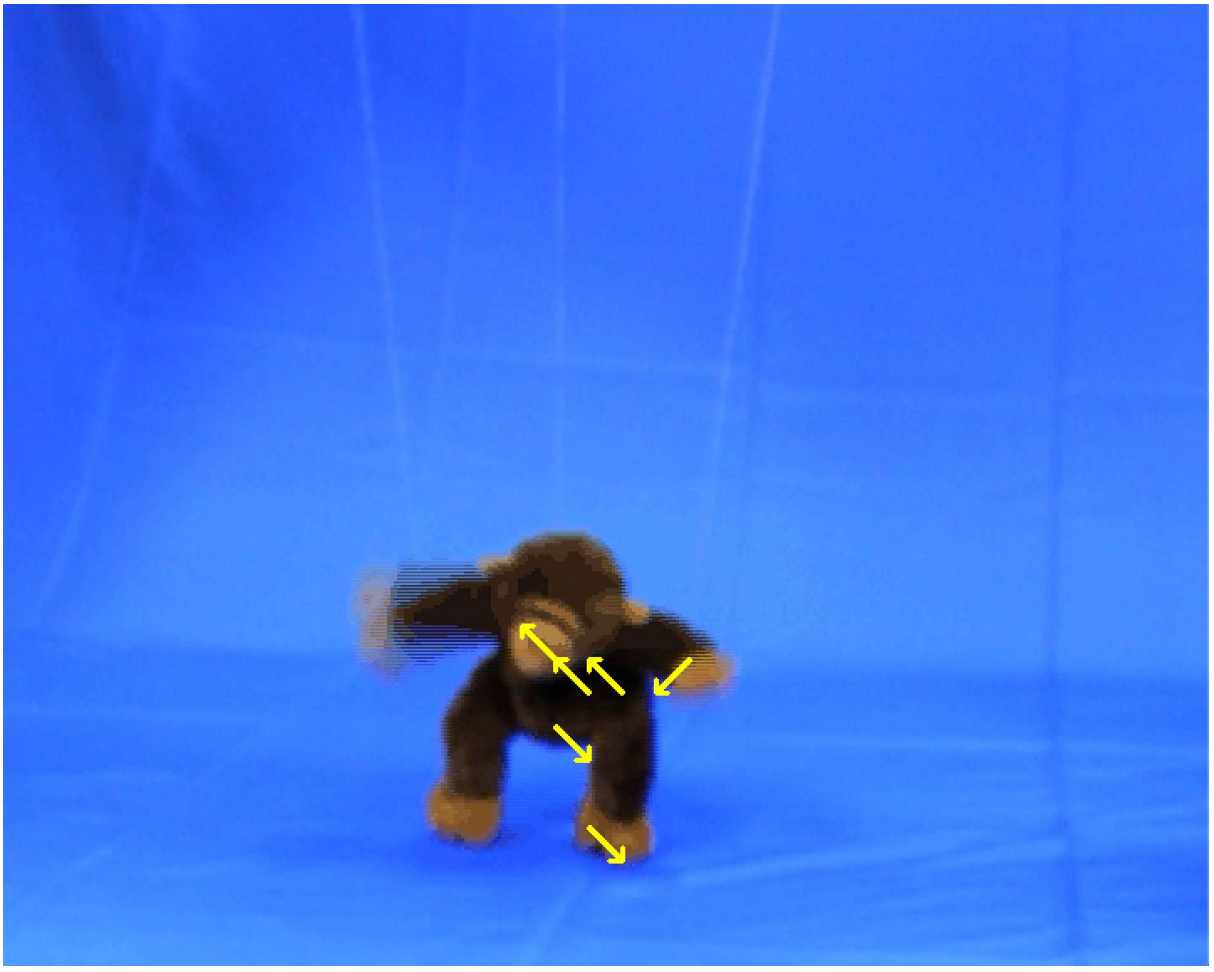
For better accuracy and efficiency in Task 1, it is rather important to find the best grid size for ssd calculating since tiny blocks are not only stacking the calculation time up but also possibly indicating the same movements of object content in the image which is unnecessary, large blocks are quicker since there are less items to loop through in a O(n) but this might end up with a great deal of information loss and makes the movement prediction quite limited and not detailed enough.

The first action to do while the production line of this task is finished, various attempts with different grid size (K * K) processed immediately. In my project, the first K attempt is 5, and it generates output:



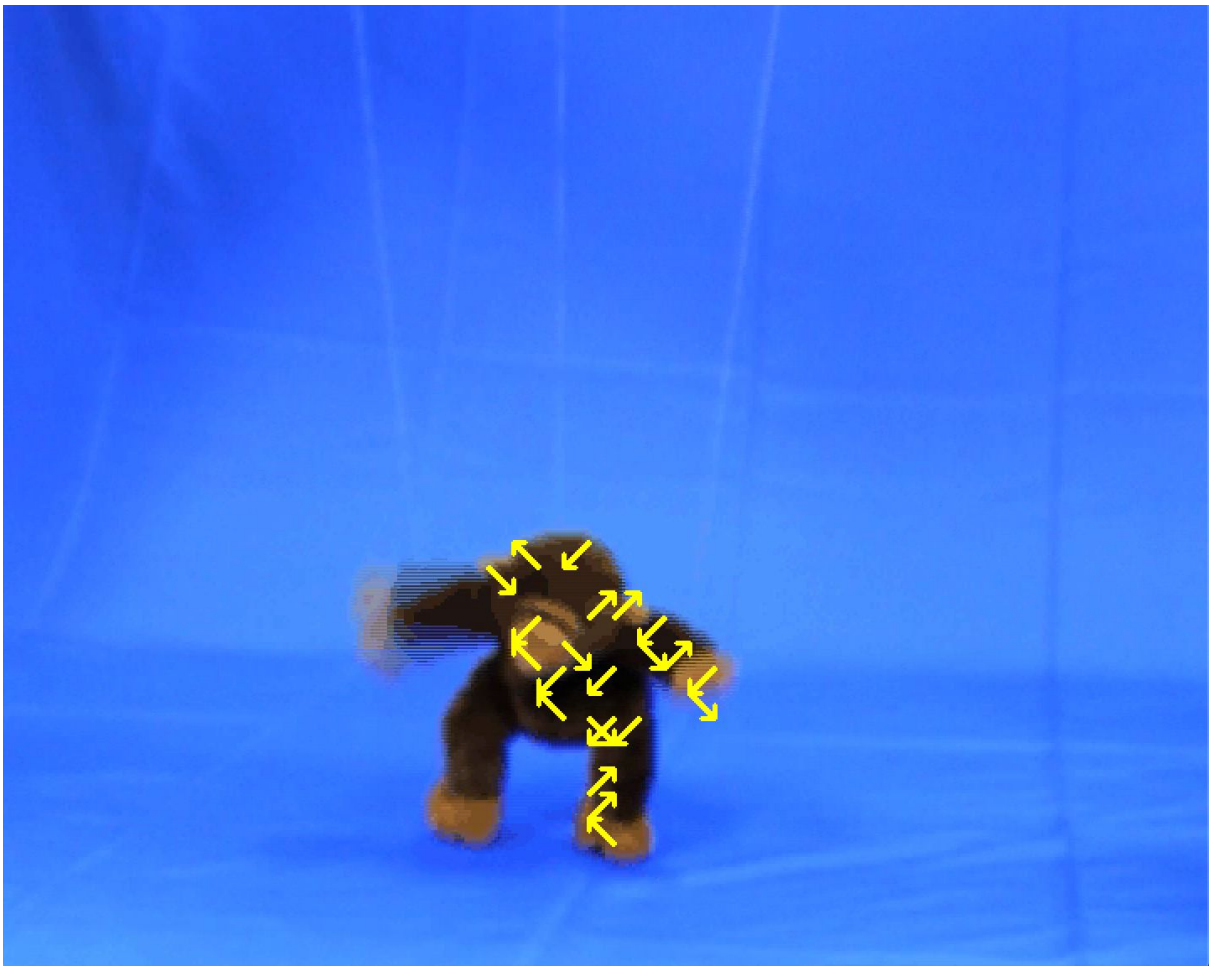
Output like this is definitely not preferred, the arrowdraw() function has already been modified to draw thin arrows but they are still squeezing with each other making this outcome unreadable.

Then, K = 19 was picked:



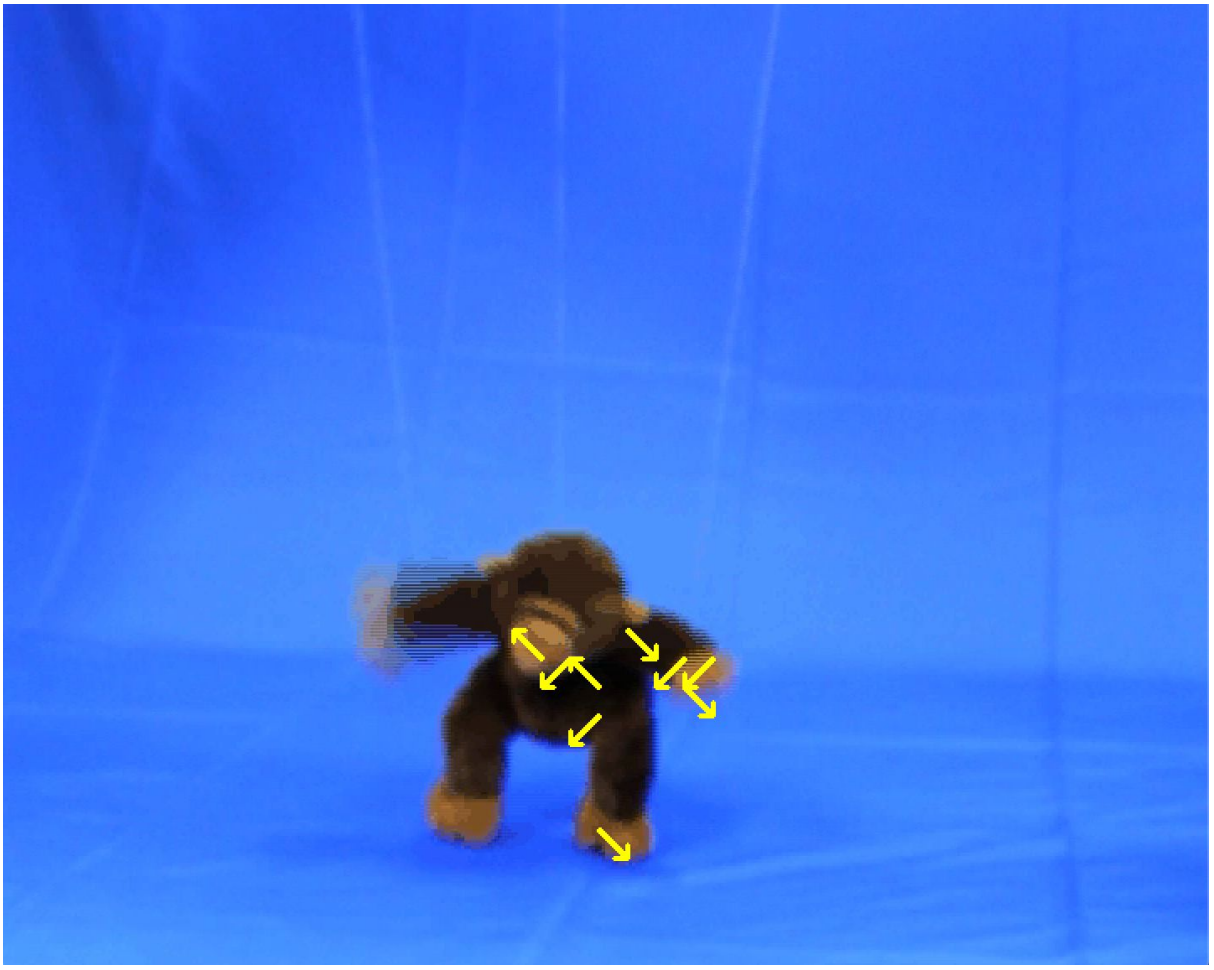
This output is clear enough, but also missing literally half of the monkey's movements which should definitely be detected. Even at the area of motion detected, the density of arrow implementation is not satisfying.

However, 19 is a great K in order to let the output readable, then K = 15:



The result is much more acceptable although there are arrows crossing each other and parallel arrows indicating motions for literally the same area.

By thinking of this K = 17 is attempted:



And finally K = 17 is finalized to be used in the project since it balanced the accuracy and efficiency the most by eliminating noises and calculation time but gives a relatively good indication.