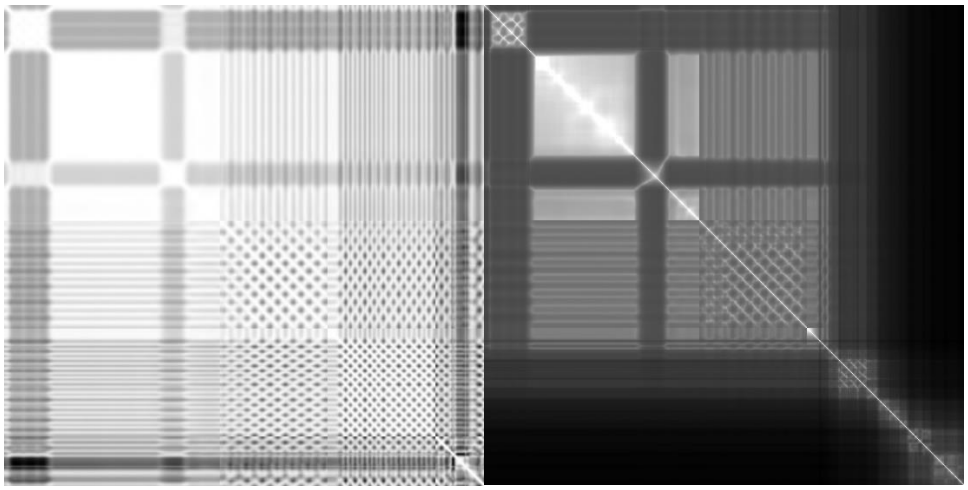
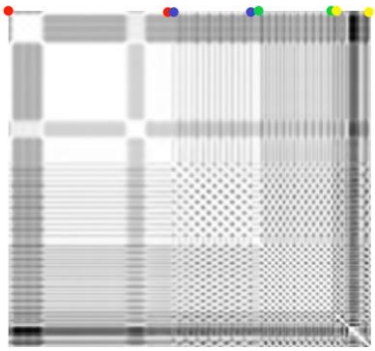
a) The task: The task about this project is to compute and draw the similarity matrix of an animation using the file markers.td based on pose distances between each frame. The animation includes four behaviors. Compute the similarity matrix comparing the full animation against itself.

b) What I have done and why: In this project I implemented the function that read 669 frames' information from the markers.td file. I constructed a frame class and put each frame's information in this class's object so that I could put these frames into a frame array and compare distance between each frame. I used OpenCV in java to draw two pictures based on position distance and rotation distance. In the position picture I added all joints' position differences square between two frames as distance equation. In the rotation picture I added all joints' rotation differences square between two frames, then I use log to get the logarithmic value so that the final value won't be too large. Finally, I set this value to 0 if it was smaller than 0 because the color ranged from 0 to 255.



Position picture Rotation picture



c) Interpretation of results: The whiter in picture, the more similar two frames are. We can see clearly both pictures have four squares along the diagonal lines, which corresponding to four motions. Seeing from left-top to right-down, frames between red points are frames of waving motion, because their positions are similar and there are many loops in rotation picture, which means a person stands on the ground and waves his hands. Frames between blue points are frames of walking motion and between green points are frames of running motion, because there are both many loops in position and rotation picture, while there are also many loops in running and walking. Smaller loops are corresponding to running motion because the motion loop changes faster in running than walking.

Frames between yellow points are jumping motion, because the first several motion frames in position picture have loops similar with running motion's loops, which means the person is running. The remain motion frames in position picture change shape, which means the person jumps while running. But of course, These are all my speculations.