Aman Patel

March 15, 2020

CSCI-B 456

Project 1 Observations and Problems

With the given values for the initial position of the boat and the speed and size of the wooden block, the boat needed to move at most 6 times to avoid the wooden block. In fact, with the given dimensions of the scene, the boat would’ve been able to avoid a wooden block of any height, given there was enough space for the boat. This is because the wooden block took 40 cycles to reach the boat while the boat took at most 23 cycles to reach the top or the bottom ().

Nearest-neighbor interpolation was used when resizing images, as it provided the greatest amount of detail without producing a black border. The boat images were scaled down by a factor of 20.5, and each image maintained a significant amount of detail, as seen in the included example images. The Roberts edge filter was used to detect the wooden block because it produced the sharpest edges and did not include any unwanted pixels or exclude any necessary pixels.

At 10-20% CPU usage, the average time elapsed per iteration was approximately 0.04 seconds. Most of this time was from edge detection and from finding connected components.

The primary issue I had during this project was maintaining the white background of the boat image after rotation. MATLAB’s *imrotate* doesn’t have a field for background color, so a different solution was required. Using a StackOverflow post for reference, I was able to successfully add a white background to the boat after rotation. The link to the post can be found in the comments of the source code.