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### **Assignment 4 - Binary Image Manipulation**

Aaron Davis I pledge that this assignment is legitimate and the work herein is my own and that I received no unauthorized assistance to complete said assignment.

```
img = imread('fish-a059.gif');
binaryfish = logical(img);
```

### (1) Display the binary test image you are using, unmodified.

```
imshow(binaryfish);

%Web Address: http://www.lems.brown.edu/~dmc/Fish.html
%Dimensions: 95px x 152px
```



## (2)Scroll that test image up by 10 pixels and display the result.

fish2 = scrollUp(binaryfish, 10);
imshow(fish2);



## (3) Scroll the test image down by 10 pixels and display the result.

fish3 = scrollDown(binaryfish, 10);
imshow(fish3);



## (4) Scroll the test image left by half its width and display the result.

```
sizef = size(binaryfish);
fish4= scrollLeft(binaryfish, (sizef(:,2)/2));
imshow(fish4);
```



## (5) Scroll the result image from (4) back to the right by the same amount

and display the result.

fish5 = scrollRight(binaryfish, (sizef(:,2)/2));
imshow(fish5);



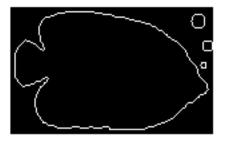
# (6) In a comment, answer this question in your own words. Is the image

from (5) the same as the original image? Why or why not?

%The image in (5) is not identical to the original because when the image %was moved to the left in 4, the part that moved off of the edge of the %image was lost, so when it was moved back to the right there was only %black space.

### (7) Compute and display the boundary image.

fish7 = FindBoundary(binaryfish);
imshow(fish7);



### (8) Dilate your test image. Then dilate that result. Then dilate that

%result. (So the original image will now have been dilated three times).
%Display the result.
fish8 = DialateImage(DialateImage(DialateImage(binaryfish)));
imshow(fish8);



## (8) Erode your test image. Then erode that result. Then erode that result.

%(So the original image will now have been eroded three times). Display the
%result.
erodef = ErodeImage(ErodeImage(ErodeImage(binaryfish)));

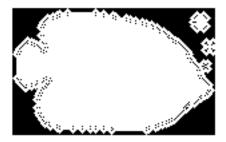
imshow(erodef);



## (9) Take the result image from (8), and dilate it 3 times. Display the

result.

fish9 = DialateImage(DialateImage(DialateImage(erodef)));
imshow(fish9);



# (10) In a comment, answer this question in your own words. Is the image

%from (9) the same as the original image? Why or why not?

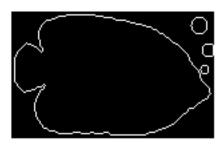
\*The Image in (9) would not be the same as the original simply because of \*the amount of information about shape lost in the erosion, and the jagged \*edges, etc. created in erosion.

### (11) Find the boundary of the test image. Dilate it once. Display the

result.

```
boundaryf = (FindBoundary(binaryfish));
fish11 = DialateImage(boundaryf);
imshow(fish11);

%%(12) Dilate the test image once, then find the boundary of the result.
%Display this image.
dialatedf = DialateImage(binaryfish);
fish12 = FindBoundary(dialatedf);
imshow(fish12);
```



## (13) In a comment, answer this question in your own words. What is the

difference, if any, between the images from (11) and (12)?

%The image in (11) is the boundary of the dialated image. It is 1 pixel %wide and at the "area of boundary" of the dialated image. The image in %(12) is the boundary of the original image itself, dialated. It is more %than 1 pixel wide and at the "area of boundary" for the original image. %The main difference is width of the line, but the placing is altered also.

#### **Conclusion**

%I had difficulty figuring out the logistics of finding the boundary of and %dialating the image ecause of the complex logical statement. I really %learned a substantial amount from the assignment. It helped me understand %logical operators (which I had trouble with previously, not due to the %quality of the lectures of course XD.) I also really began to understand %the logistics and functionality of functions.

