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----------PROGRAMMING:

Prob 3: The explanation has been added in the main pdf file.

Problem 4: (Morphological Operations)

4b)

i) remove windows and doors (house.pgm):

The zip had no house.pgm, but I will use church.pgm as it aligns to what is expected and it is the only image not used.

Top left: original church.pgm

Top right: opening using m = 5

Bottom left: opening using m = 10

Bottom right: opening using m = 12

Left: Closing using m=5

Right: closing using m=10.

We can see with the help of opening or also closing we can remove windows and doors as seen for different values of m.

ii) create university owls at night (owl.pgm):

White tophat (WTH) is used to extract these small bright structures.

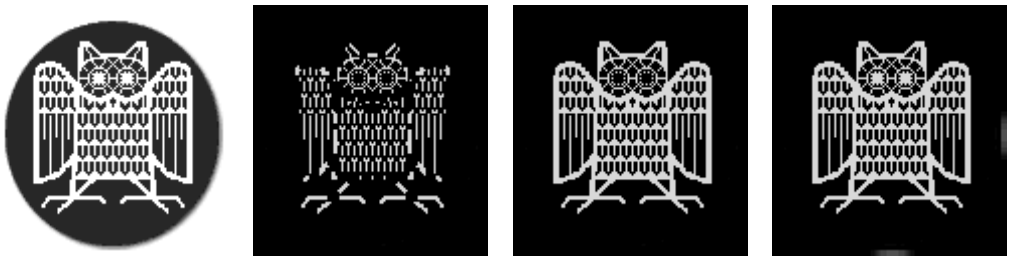


Image 1: Original owl.pgm

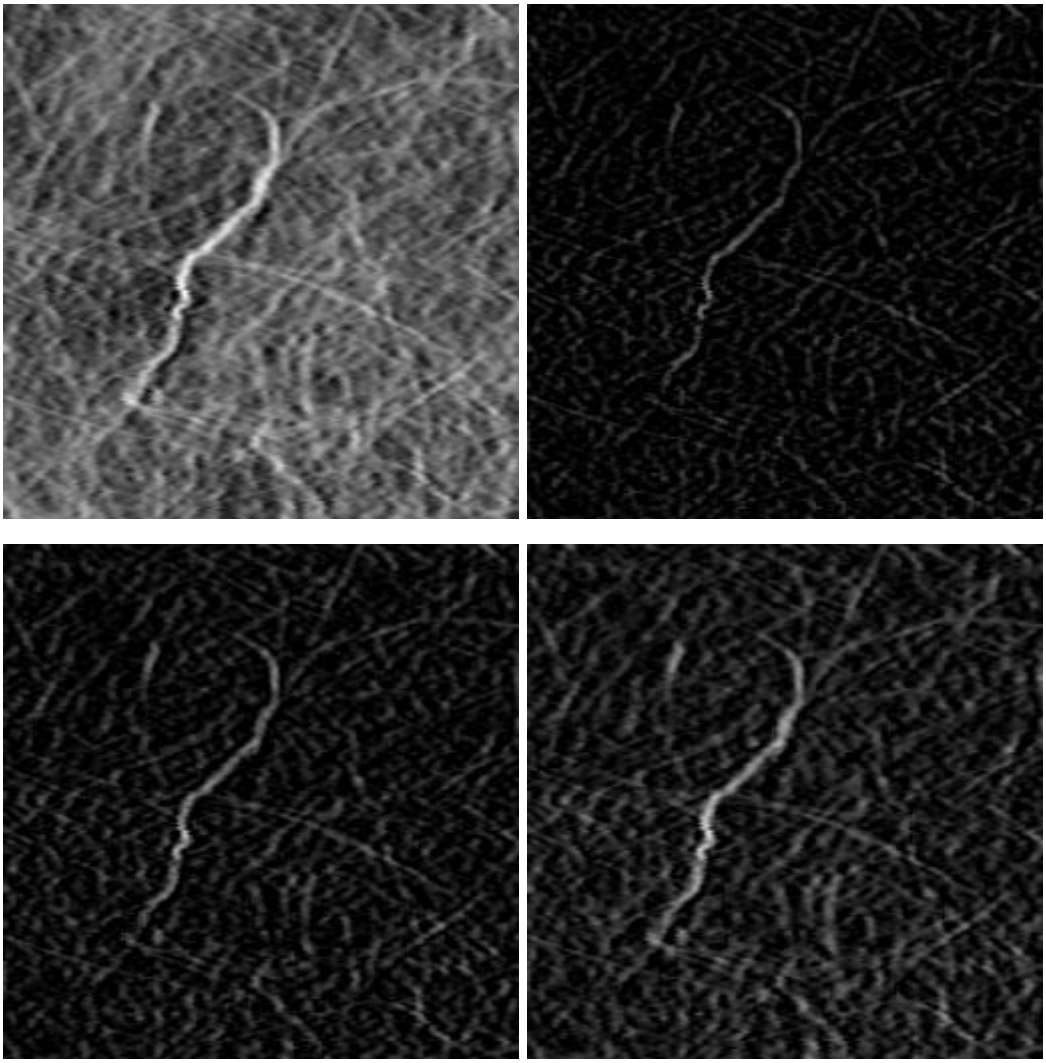
Image 2: WTH with m = 1

Image 3: WTH with m = 2

Image 4: WTH with m = 3

We can see that using White tophat we can extract the brigh structures from our owl image.

iii) separate image structures from their background (fabric.pgm & angiogram.pgm:



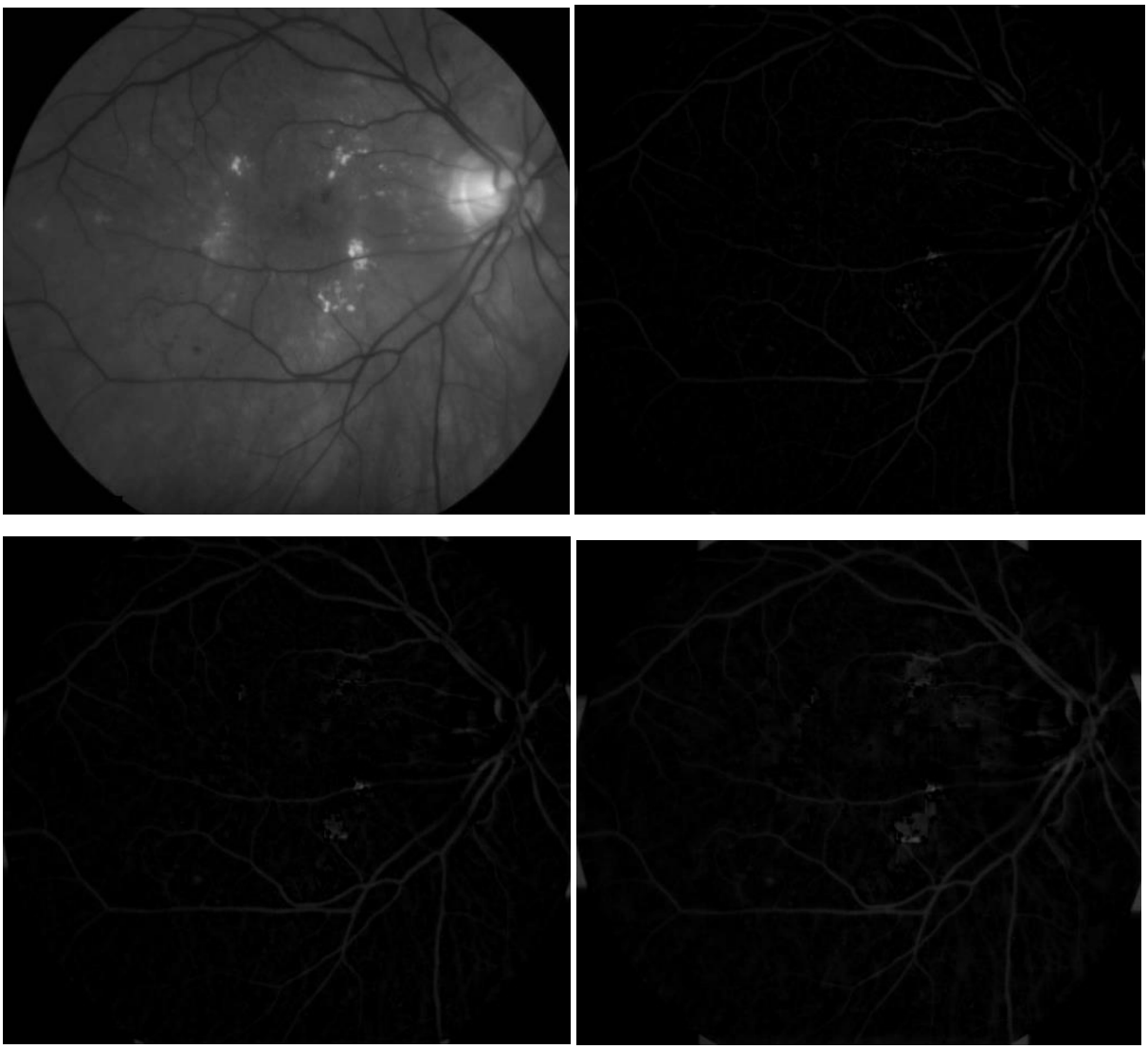
Top left: original fabric.pgm

Top right: WTH using m = 2

Bottom left: WTH using m = 3

Bottom right: WTH using m = 5

We can see that to extract bright structures we again take WTH.



Top left: original angiogram.pgm

Top right: BTH using m = 3

Bottom left: BTH using m = 5

Bottom right: BTH using m = 10

I was not able to normalize using xv, as it is not working on my system, I use IrfanView to visualise.

Normalizing will give better results.

But the idea here is we extract dark structures using BTH for different values of m as shown above.

6/6