

# CS663 - Assignment 2 - Question 8

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September 2024

- For LC1:



Original LC1



Local histogram equalisation with  $7 \times 7$  bin



Global histogram equalisation

Even though the  $7 \times 7$  locally equalized image looks much worse compared to the global image, it still provides some useful details about edges and corners. We can use this local image to estimate the number of small branches.



Local histogram equalisation with  $31 \times 31$  bin



Global histogram equalisation

The  $31 \times 31$  locally equalized image is more recognizable than the  $7 \times 7$  version, but it still doesn't compare to the global image overall. The first tile at the bottom shows some slope, which can be identified by the contrasting white line in the local image.

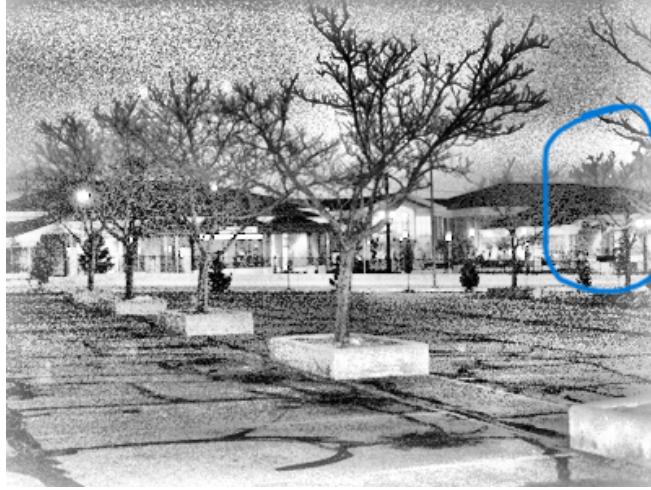


Local histogram equalisation with  $51 \times 51$  bin



Global histogram equalisation

The  $51 \times 51$  locally equalized image is quite similar to the  $31 \times 31$  version. In the global image, the left middle block has low contrast with dark, low-intensity pixels, but the local image reveals much more contrast and provides useful information about the trees in that area.



Local histogram equalisation with  $71 \times 71$  bin



Global histogram equalisation

The  $71 \times 71$  locally equalized image is closer to the global image than the smaller bin size images. In particular, the right middle block of the global image, which shows low contrast near a hotel in the background, becomes much clearer in the local image.

- For **LC2**:



Original LC2 image

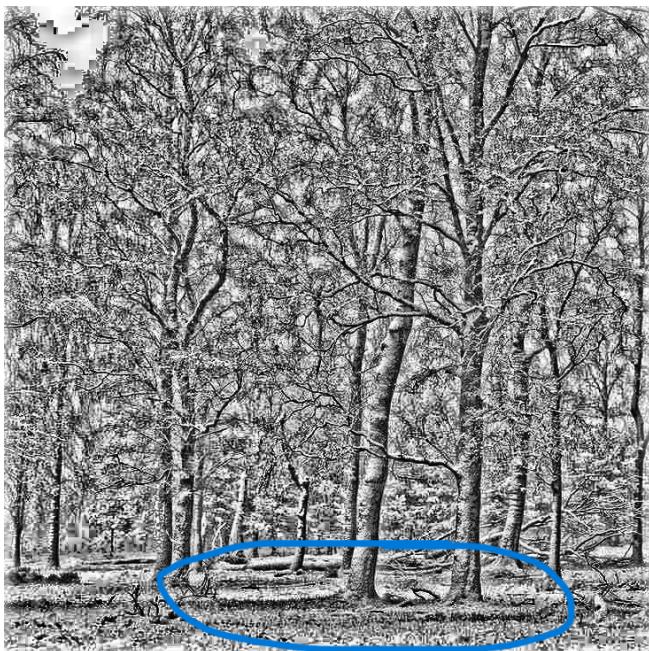


Local histogram equalisation with  $7 \times 7$  bin



Global histogram equalisation

Just like with the LC1 image, the  $7 \times 7$  locally equalized image doesn't visually improve upon the original. However, it does offer some edge enhancements that could be useful as an intermediate step in other algorithms.



Local histogram equalisation with  $31 \times 31$  bin



Global histogram equalisation

The bottom part of the global image, near the base of the tree, has low contrast with high intensity values. In the local image, this area shows better contrast and is more clearly defined.



Local histogram equalisation with  $51 \times 51$  bin



Global histogram equalisation

In the block near the right edge, which has low contrast with low intensity values, the local image provides better visibility. This allows for a more accurate estimation of the branches of the nearby trees.



Local histogram equalisation with  $71 \times 71$  bin



Global histogram equalisation

In the left bottom block, the local image reveals a tree that is far away, which might not be as noticeable in the global image due to the low contrast of the high intensity values.

For the given LC1 and LC2 images, none of the locally histogram equalized images offer better overall enhancement than the global histogram equalized images. However, the locally equalized images do provide additional information when we focus on specific small regions.