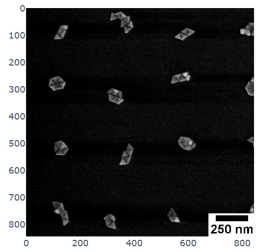
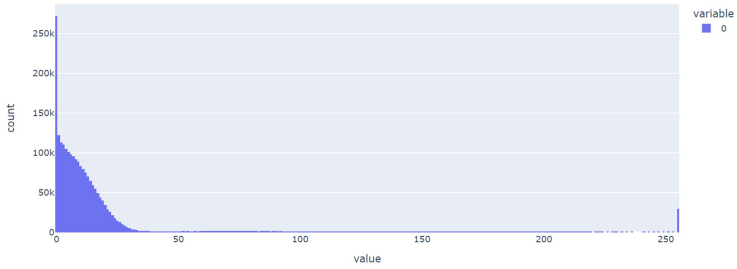
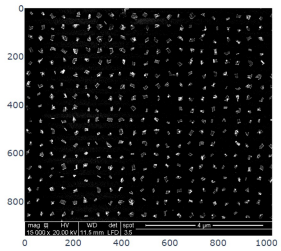
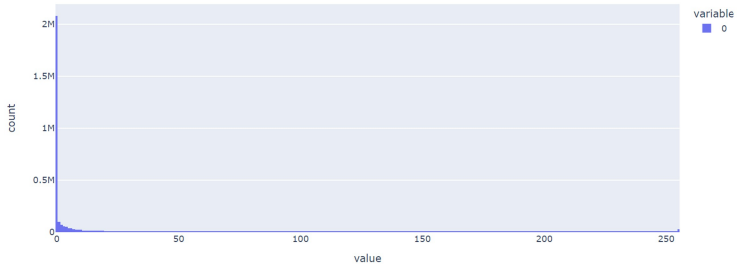
Tests :

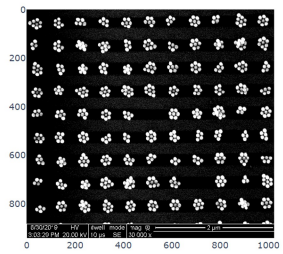
09 December 2021 01:55

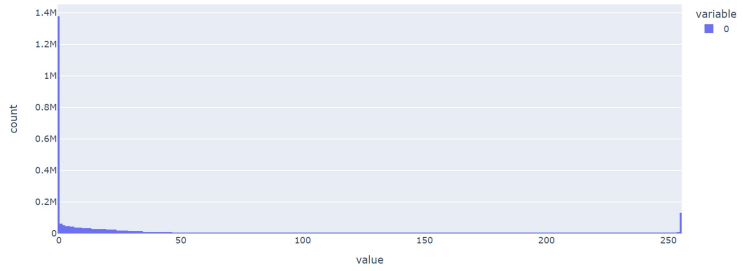












If observed carefully there's 3 things that are fairly apparent,

1. There's a bimodality in the images 2 sets of independent regional maxima one towards the bright end and the other towards the darker end
2. There exists sufficient bias in the images towards the darker mode
3. The variance in the blocks which have noise is fairly high.

To begin, we use, a gaussian filter with the normalised gausian kernel , followed by the median filter.
We propose an "adaptive" threshold following Otsu's Law.
We apply the algorithm by doing the following manually:

1. Assume a threshold
2. Segment the image into the 2 parts
3. Calculate the wight of the back/foreground, which is avg number of pixels in there(wb/wf)
4. Form a normalised weighted average intensities, by multiplying intensity with the no. of particles for the background and the foreground respectively normalised over the total particles of that type (ub/uf)
5. Calculate the between class variance (wb*wf(ub-uf)^2)
6. Repeat the steps 2-6 for the between class variance for all intensities to maximise the value
7. Select the intensity value that corresponds to the max variance as the new threshhold
8. Perform thresholding to binarise the image, this will make the image truly bimodal