

## Exercise Sheet 3

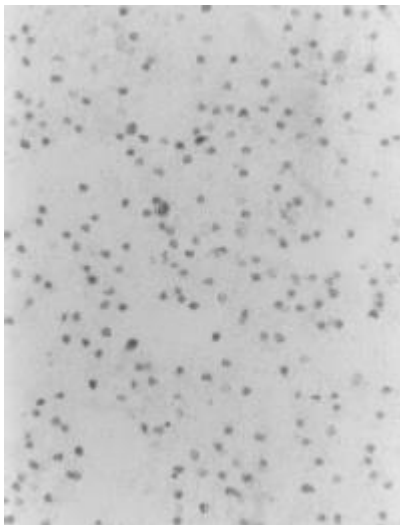
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### 1. Histograms

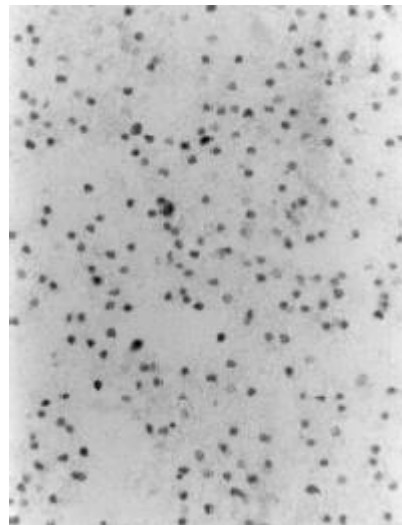
- Build a function that calculates the Intensity (HSI) histogram of an image.
- Compare the histogram you have obtained from the image “*lena\_intensity*” with the image “*Histogram\_lena\_intensity*” (see support images)
- [Optional] Display the histogram in a new window (*Frame*)
  - i. Change the function `paint` (public void `paint(Graphics g)`) of the new window, that should draw a histogram based on an internal variable of type `int[256]`.
  - ii. Use classes from `Java.awt.Graphics`: `drawLine`, `drawRect`, etc.

### 2. Dynamic range manipulation

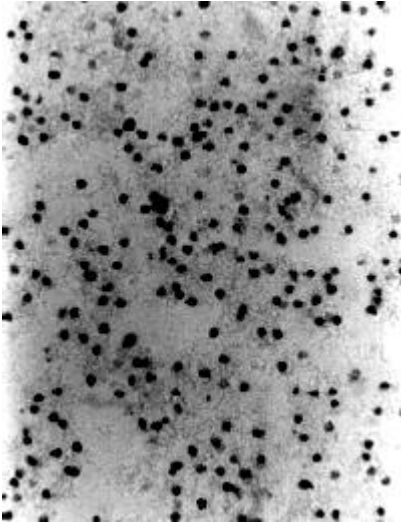
- Build a function that applies *contrast stretching* to an image.
  - i. Use the minimum and maximum value of the histogram
  - ii. Use the values between 5% and 95% of the pixel distribution within the histogram (i.e. ignore 10% of all the image pixels)
- Apply the function to the image “*dots*” and compare it with the image “*dotsEnhancedContrast*”, where the 5% - 95% values were used.
- [Optional] Build a function that applies *histogram equalization*.



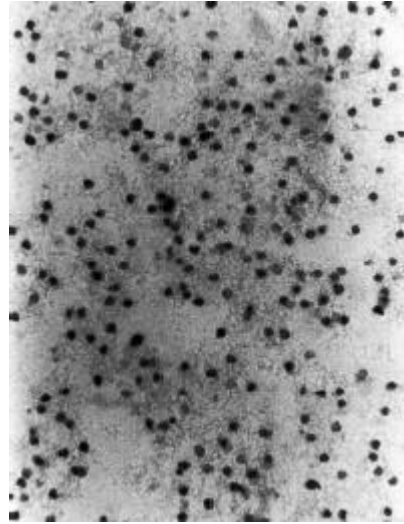
a) Dots.jpg



b) Contrast stretching (0-100%)



c) Contrast stretching (5%-95%).



d) Histogram equalization