Intro

Background

Data acquisition

Data preprocessing

* Filtering

Determining texture quality and surface statistics/General Approaches for Object Detection

* Image Object Detection
* Normed cross correlation
* Hough transform
* Centre estimation
* Segmentation
* Feature extraction

Results

Conclusion

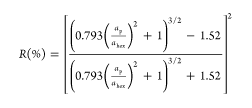
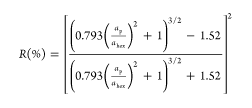
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Code operations:

Part 1:

* Counts the numbers of spheres in the image
* Finds the distribution of sphere diameters and average
* Calculates the percentage of the image that is covered with the spheres and not covered
* Can distinguish whether the image is 'good' = most is covered with spheres, or 'bad' = there are large patches that are not covered(/packing density <0.7)
* Finds the distribution of sphere separation, only when the separation is less than 1.5 x average diameter of spheres

Part 2:

* Finds the reflection, R, for a surface in an image:
* ap and ahex are the average diameter of an individual sphere and the average distance of separation of spheres in a close packed surface.
* Where:







Part 3:

* Find the number and size of each uncovered region in 'bad' images
* Counts how many times there are double layers (a sphere above the base layer)
* Characterise images by size of grains - number of hexagon groups, or triangular groups.