**core\_images**

The following lines of code are examples of my experiments. You are free to take them to test and experiment on your own. I am not responsible for errors in the code and the use you make of it.

All the examples shown here come from templates literally stolen from <https://scikit-image.org/> . This is an outgrowth of a work initiated a log time ago (<https://www.onepetro.org/conference-paper/SPWLA-2011-Z> ) but the scikit tools rises this to another level, and I am only scratching the surface of the applications that can come from here. Obviously this can be automatized to batch process a lot of images. In the real case of cores, there are a few artifacts that need to be taken into account, like broken pieces that are so common. But the tools in scikit-image can be explored to tackle this type of problem. In here I am showing just 3 simple examples.

**strom\_histogram\_equal2**

The original core image of a stromatolite (<https://geology.utah.gov/map-pub/survey-notes/core-center-news/lacustrine-teaching-tool/> ) goes through filters that enhance the color contrast. The current version has 3 outputs ‘Contrast stretching’, ‘Histogram equalization’ and ‘Adaptative equalization’. The original image is in piece1.png and the final in img\_adapteq.png. The processing really enhances contrast and makes looking at the final detail much easier. In this example the histograms are stretched to 10 and 90, but the user can play with these parameters to get images more adapted to his/her needs.

**strom\_histogram\_equal3**

The same image as before is passed through another set of filters that enhances the intensity histogram by Global or Local equalization. The global result (global\_eq.png) divides the image into two parts, northeast and southwest. I am no paleontologist but there are changes in the original fossil, or in the fossilization process, as imaged by those two parts; I am sure that an expert eye spotted said changes in the original photo but even my uncultured eye can see them clearly now. The local equalization (result in local\_eq.png) does a piecewise equalization of the histograms. The result is an enhancement of detail at the expense of losing some of the perspective. Like looking at the trees instead of the forest. Both outputs can have a use in the study of this type of photo.

**segmentation\_color**

This is a very useful tool to analyze core photos I am showing an application to a thin slice here (taken from page 3. 12 of <https://d1rkab7tlqy5f1.cloudfront.net/CiTG/Over%20faculteit/Afdelingen/Geoscience%20Engineering/Education/petrophysics.pdf> ). Only two colors are used here to make a binary separation to distinguish grains from pores the inverted color result (obtained using Control-Alt-I in windows Paint) can be contrasted directly with the output in the original reference. Making a histogram of those two colors can yield a porosity estimate easily. There are many other applications. I the guise of my original work, this can expedite and objectivize the analysis of laminated sequences. I could not find a publicly available image to show, but results are excellent. And using more colors instead of just 2, can subdivide the image not only into two parts (sand and shale) but facies or differences in invasion profiles can be characterized. Again this is just scratching the surface of what can be done with these wonderful tools