VERTICAL PROFILE

A USER FRIENDLY SOFTWARE FOR ANALYZING LARGE IMAGES

Vertical profiles can be made for the whole image or for a defined area. There are three modes: *Grain Size*, *Background* and *Object Extraction*.

The *Grain Size* mode is an experimental tool. It does not require any preprocessing or manipulation. But two conditions must be satisfied to obtain valid results: the contrast between the grains and the background must be sufficient and their color must be quite uniform.

The other modes use results previously computed by the *Background* or *Object Extraction* tool. The profile shows the vertical distribution of an object type.

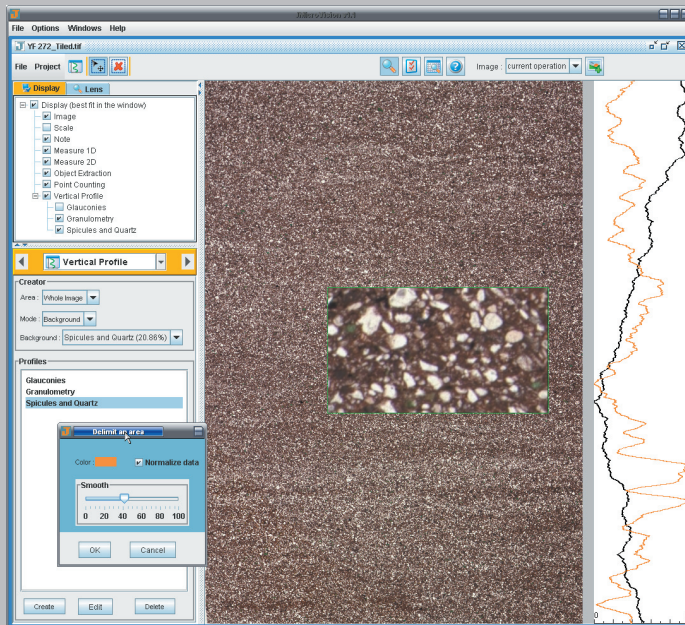The profiles can be normalized to accentuate the variations and smoothed to remove the noise (see image).

• **Vertical profiles of a sandy limestone including glauconies (black: granulometry, orange: quartz and spicules distribution)**

JMicroVision has a simple and intuitive user interface with powerful features. Using it does not require to be a specialist of image analysis, basic knowledge is enough.

JMicroVision has been developed especially to analyze high definition images of rock thin sections, but it can easily be used in other domains. It contains tools to quantify either manually or automatically.

Main Features

- Read images in TIFF, BMP, FlashPiX, GIF, JPEG, PNG and PNM formats
- Quantify components: objects or background
- Object analysis (size, shape, orientation, texture ...)
- Object classification
- Digital point counting
- Data collection in one or two dimensions
- Image annotation and description card
- Vertical profile (vertical variation of granulometry, objects or background)
- Save all measures, data, calibration and preferences in a single project file

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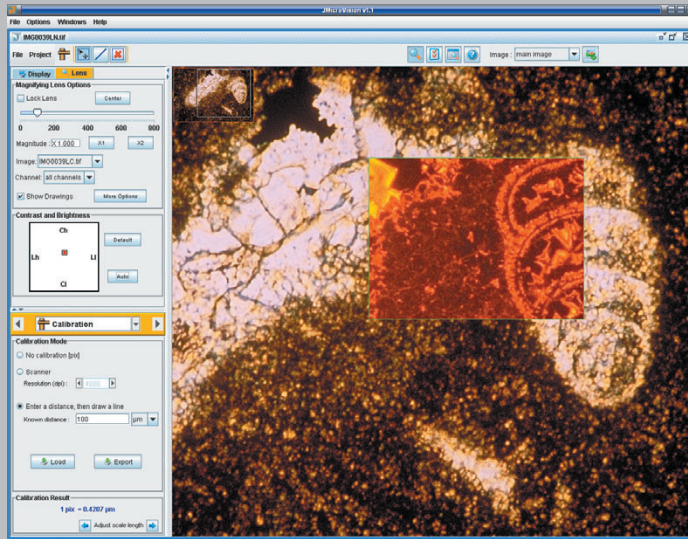Rue des Maraîchers 13
CH-1205 Geneva
Switzerland

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Software available for free at http://www.jmicrovision.com
Supported platforms: Windows all versions, Linux x86, Solaris x86, Solaris Sparc and Mac OS X

VISUALIZATION/LENS/CALIBRATION

• Cathodoluminescence image displaying in the lens

Images even larger than 100 MB can be visualized and analyzed in JMicroVision.

The entire image is visible at the top left corner (thumbnail). Dragging the rectangle over the thumbnail allows to navigate through the image.

The magnifying lens is very useful in many situations. It enables to display one or all channels (real gray, red, green, blue, hue, luminance and saturation) of an image. In addition, the contrast and the luminosity can be adjusted.

The *Calibration* tool can convert the pixel values automatically to any other unit of measurement (European or Anglo-Saxon).

POINT COUNTING
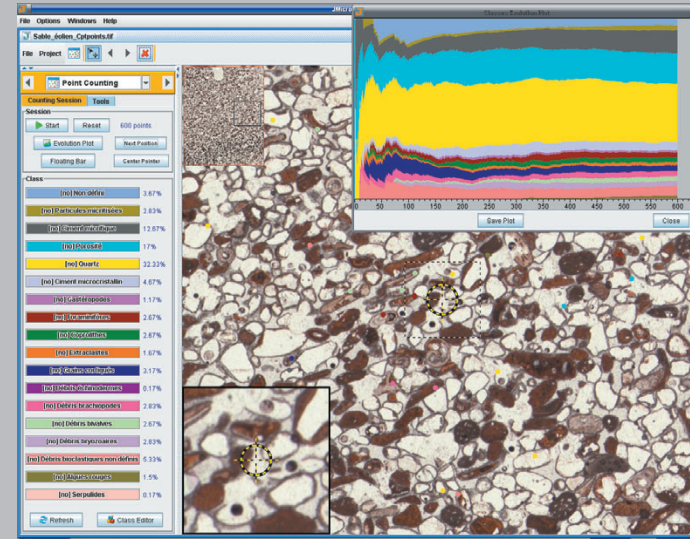
• Point counting in eolian sand after 600 points

Point counting is an alternative method to quantify image components stochastically, especially when the image is too complex to use the *Object Extraction* tool. Performing a digital point counting is much more pleasant than a counting under a microscope.

The grid used by the counting is either random or recursive. Classes can be added, removed or merged even during the counting. It is possible to limit the counting to an area and/or an object type (previously extracted with the *Background* or *Object Extraction* tool).

The stochastic criterion to stop the counting is the stabilization of percentages in an evolution plot (on the right top corner of the image).

NOTE/1D OR 2D MEASURE
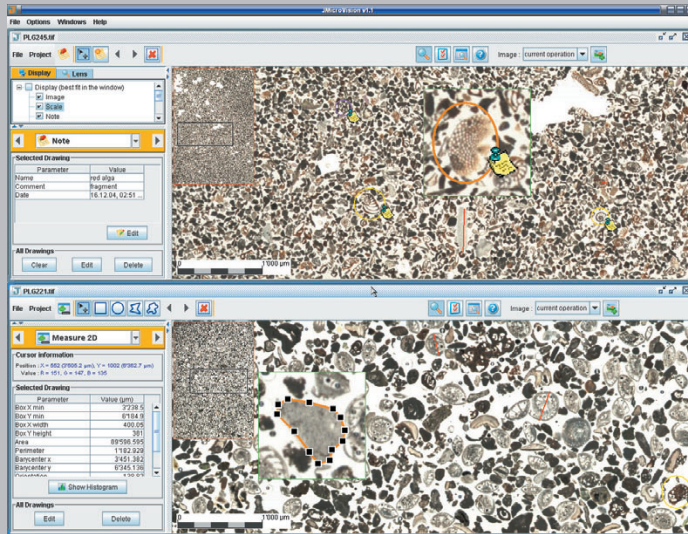
• 1D/2D measures and notes on two images of eolian sand

In JMicroVision, more than one image can be visualized in the workspace. Each image has its own tools, which enables to work independently and to compare the images.

It is possible to attach notes to the relevant objects or properties of the image (see the lens of the first image).

When the image is calibrated, the *1D* or *2D Measure* tool produces drawings with real measurements. In addition, a scale can be displayed at the left bottom on the image.

After locking the lens, the user can create, transform or move drawings within the lens with different magnifications (see the lens of the second image).

OBJECT EXTRACTION/CLASSIFICATION
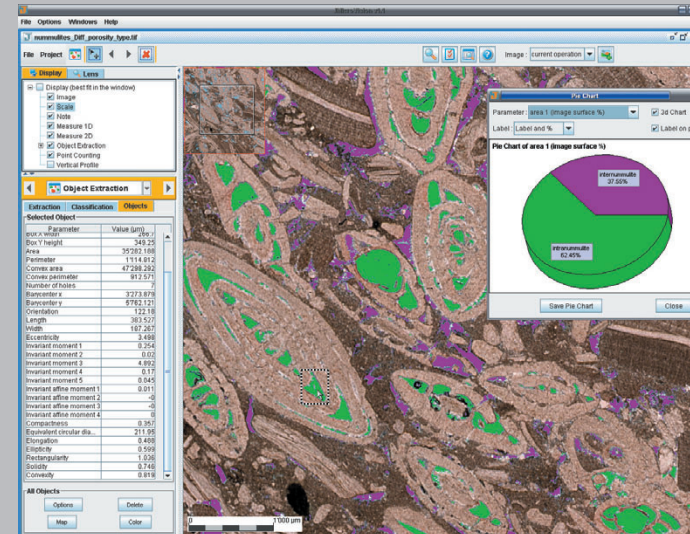
• Classification of pore types in nummulitic limestone

Different methods can be used to extract the desired objects.

The one commonly used is the segmentation by threshold. The user selects a range of values in an image histogram which correspond to the pixel intensity of the desired objects. In a color image, there are three histograms (RGB or IHS) and the final selection combines the three.

When performing the object extraction, some 40 position and shape descriptors are automatically computed. They are used by the classification module to differentiate the object types. The classification can be made by selecting a range of values in a descriptor or by using supervised learning.