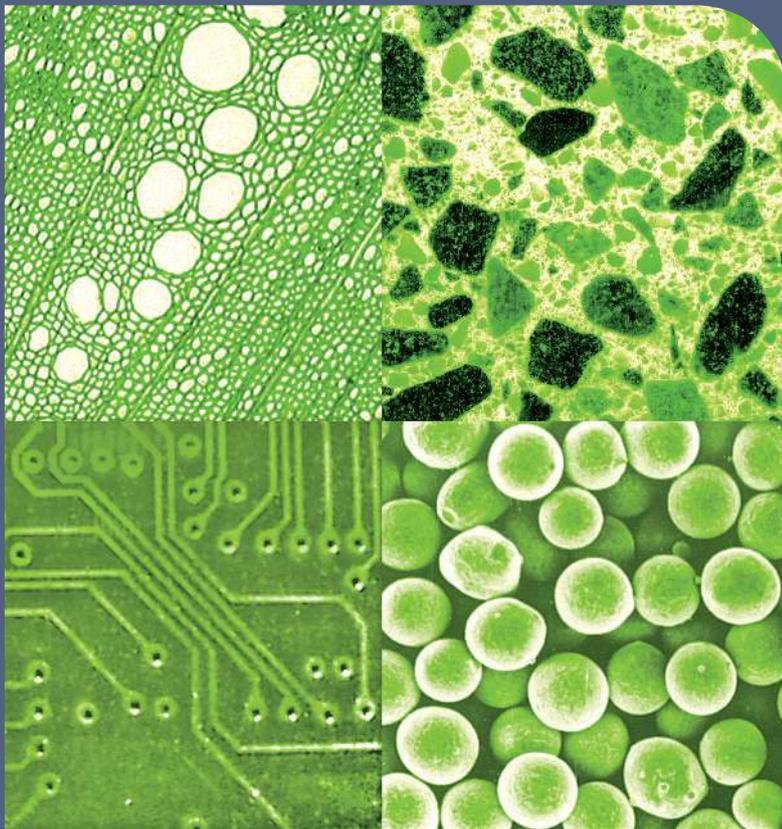


Aphelion Lab

IMAGE PROCESSING
AND IMAGE ANALYSIS SOFTWARE
FOCUSING ON RESULTS



BIOLOGY / COSMETICS / GEOLOGY
INSPECTION / MATERIALS SCIENCE

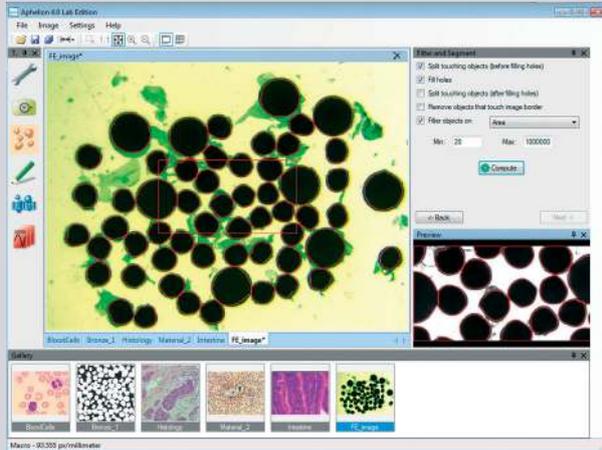
METROLOGY
OBJECT RECOGNITION

PHARMACOLOGY / QUALITY CONTROL
REMOTE SENSING / ROBOTICS

SECURITY / TRACKING

Image Analysis Software for Non-experts in Imaging

The image analysis software market has seen many products for advanced users, as well as products limited to specific functions for a specific application. Neither product type effectively addressed the needs of non-experts in imaging science and programming. For these persons, and for those who need to create effective, controlled, laboratory processes to extract data from digital images, now there is a software product to meet all of these needs—Aphelion™ Lab.



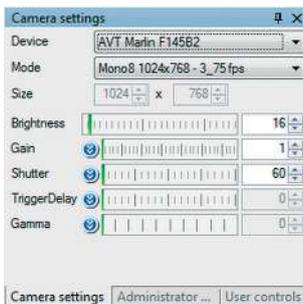
While based on the powerful Aphelion™ Developer image processing and analysis libraries, Aphelion™ Lab was specifically designed for use by non-experts in imaging, regardless of the user's own field of expertise. A set of context-based interfaces, guide the user through creation of an image analysis project. This includes steps for digital image acquisition, image processing operator selection and execution, image editing, measurement selection and computation, and analysis report generation. Users can also manually outline objects of interest to compute their shape and size parameters. While useful for virtually all image domains, Aphelion™ Lab is especially well-suited for metrology and microscopy applications.

Settings

All data and measurements generated in the Aphelion™ Lab environment are automatically managed by the software to ensure high-quality analysis. Only users with administrator rights can configure the software, specifying where results will be saved, setting up the camera device, defining calibration profiles, and selecting the list of measurements to compute on images. Access to all these important settings is password protected. Once the system is fully configured, the user can proceed with analysis of images and concentrate only on the results. All image management tasks, which were cumbersome in the past, are done in a transparent way by the software.

Camera Settings

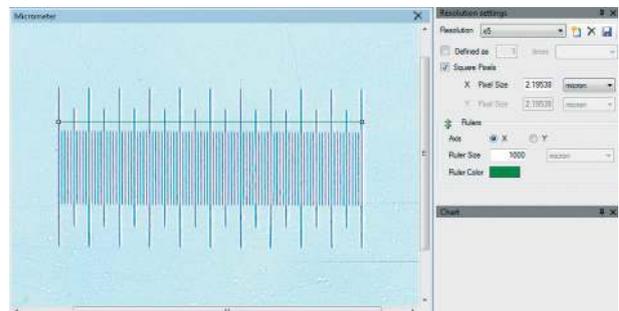
Since Aphelion™ Lab complies with the IIDC specification, digital image acquisition in Aphelion™ Lab is plug-and-play using any FireWire camera available on the market.



Once the IEEE1394 driver is installed, a live image can be displayed in the Aphelion™ Lab interface within a few seconds. The user has only to select the right camera configuration settings and adjust the exposure parameters to acquire high-quality images.

Calibration Settings

A powerful tool enables users to quickly and easily create calibration profiles. Aphelion™ Lab uses these to report measurements in real-world units for all captured images. Using a pop-up ruler overlaid on an image of a known item (e.g., a micrometer), the user correlates the size of the item in the image (i.e., in pixel unit) with its real-world size (e.g., in metric unit) to define the calibration profile. There is no limit on the number of calibration profiles that can be saved, enabling the generation of accurate real-world measurements for any calibrated acquisition device used with Aphelion™ Lab.



Measurement Settings

Aphelion™ Lab includes a set of object measurements (e.g., length, area, perimeter, max, min). The user selects those measurements that are to be performed automatically during image analysis. More than 50 different measurements can be computed per object, and there is no limit on the number of objects per image or sample. If a calibration profile has been selected, all measurements are provided in real-world units.

Image Acquisition

Capturing an image using image processing/analysis software has never been so easy and intuitive. Select the camera mode (image size and frame rate), define the exposure parameters, start the acquisition to display a live image, focus the camera, apply a shading correction to get an even background, and then capture the image to be analyzed. The current calibration profile is automatically applied to the live image and subsequent images. Images previously captured and stored on media can also be analyzed with Aphelion™ Lab.



Object Extraction

The Object Extraction task available in Aphelion™ Lab extracts objects of interest in three steps. First, the user selects one of the available color channels to process; then the Object Extraction task executes to locate objects in the image. Finally, the user picks one or a combination of the following operations:

- Disconnect objects that are touching or overlapping
- Remove objects touching the image border
- Fill the holes occurring in objects
- Filter objects based on an measurement value specified by the user

A preview of results is always available following each step of the Object Extraction task to enable user adjustment of parameters before execution of the next process.

Object Editing

The Object Editing task provides tools for modifying the set of objects that were extracted. Adding, removing, and altering objects can be easily performed using mouse operations. An undo function is always available to go back to the previous step of the editing process. Using these tools, no image is too complex to be analyzed.



Measurements

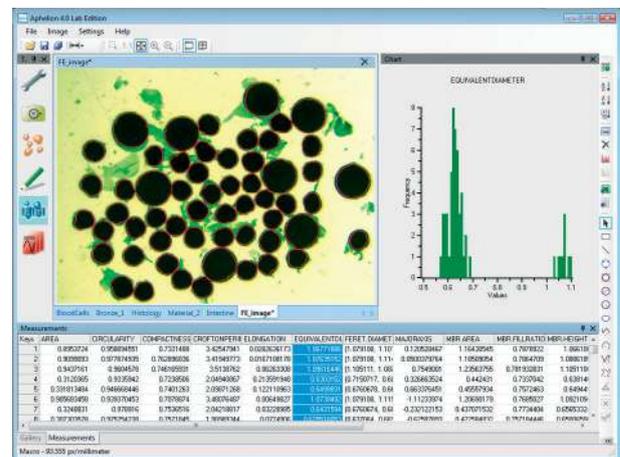
Object Measurements

Aphelion™ Lab's computing of object measurements is very quick and is transparent to the user. Measurements are displayed in a grid format for the objects that were detected or drawn in the previous steps. Grid rows correspond to objects while columns correspond to their measurement values. The interface (see beside) displays the grid, its associated image, its objects (as an overlay on the image), and a chart that displays a histogram or scatter plot of object measurement values (i.e., values in a grid

column). Any object can be highlighted simultaneously in both the image overlay and the grid by clicking on the object in either the image overlay or the object's row in the grid. An export feature saves grid data in Microsoft® Excel® or CSV file format.

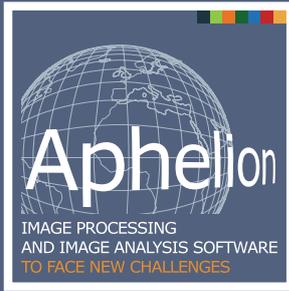
Interactive Measurements

Interactive measurement tools are also provided that let users draw on an image overlay to quickly and directly compute calibrated measurements. This is especially useful when there are only a few objects to be analyzed. The drawing tools allow the user to draw objects of virtually any shape. The measurements computed for the user-drawn objects are displayed in a simple grid format. Here, the rows correspond to the objects drawn (e.g., lines, angles, circles).



Report Generation

The final step of a typical image analysis project is to generate a report of the results obtained from the analysis. In the past, this was often done by using multiple software products, requiring multiple data exchange steps between the various products. With Aphelion™ Lab, generating a report can be done in only two steps: 1.) Specify the data needed (i.e., measurement grid and image with or without its objects overlay); and 2.) Specify an Excel® template to use for the report. The user can choose from any previously provided template or create a new one. Alternatively, the Report Generator can export the grid values to a text file in CSV format or export the image and overlay to the Windows® clip board.



Upgrade Path for Advanced Capabilities

Aphelion™ Lab provides a basic set of image operators used in its analysis of images. Should your image analysis needs become more demanding, the Aphelion™ product family provides you with an upgrade path to a more advanced product, Aphelion™ Dev. The Dev product provides much greater capabilities, including more than 400 image operators, a scripting language, a run-time version, support for both 32-bit and 64-bit systems, and a large set of optional extensions (e.g., tools for microscope automation, 3D image processing and display, image noise reduction, color segmentation).

Product Distribution

Aphelion™ Lab is compatible with Microsoft® Windows® XP, Vista®, 7, 8 and 10, and IEEE1394 cameras^[1]

Licensing:

Single User license (locked to a single computer system)

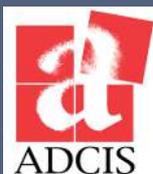
Site license

USB license key (for non-concurrent use of a Single User license on multiple computers)

Standard package:

DVD-ROM containing the Aphelion™ Lab installation program, which includes the IEEE1394 software driver^[1], and User Guide hardcopy

[1]Compliant with the IIEC 1394 Digital Camera Specification as published by the 1394 Trace Association.



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