

# ViyeeStudio User Manual



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# ViyeeStudio User Manual

## 1. Driver Installation

Open the camera driver folder, double-click the driver file, and install the driver as prompted by the system.

- 1 . Double-click driver file.
- 2 . Choose language and click “Confirm”.
- 3 . Enter the installation wizard and click "Next".
- 4 . Select the installation location and click Next.
- 5 . Click "Install" to begin the installation.
- 6 . Click “Finish” to complete the installation.

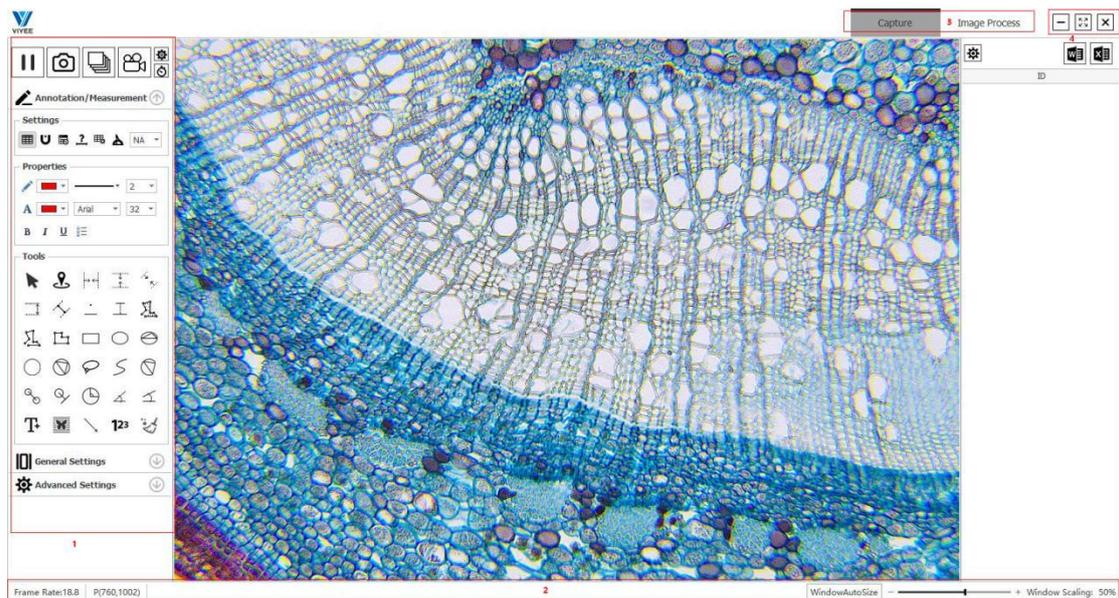
## 2. Software Installation

Open the camera software folder, double-click the software installation file, and install the software as prompted.

- 1 . Double-click ViyeeStudio install file.
- 2 . Choose language and click “Confirm”.
- 3 . Enter the installation wizard and click "Next".
- 4 . Select the installation location and click Next.
- 5 . Click "Install" to begin the installation.
- 6 . Click “Finish” to complete the installation.

## 3. User Interface

ViyeeStudio is imaging software for image capture, optimization and analysis. Matched with VIYEE cameras, it can help users to do relevant experiments and production work more conveniently. This Help Manual describes how to work with ViyeeStudio and what ViyeeStudio can do for you.



4-1

#### 1 Tools Window

There are multiple tool groups in the tool window, each of which corresponds to a different function. Some of the function parameters can be customized or reset.

#### 2 Status Bar

The status bar shows the current camera frame rate, the zoom scale of the preview screen, and the mouse pointer position coordinates. You can use the status bar to locate or enlarge the image to see the details.

#### 3 Scene

The scene is divided into measurement and image processing. You can choose the appropriate scenario based on specific requirements.

#### 4 Window Control

Includes window minimization, full screen, and closing

#### 5 Image Region

Double-click the image to enter the full screen mode. Double-click again to restore the original interface.

## 4. Capture and Measurement

### Capture Mode

ViyeeStudio can capture high quality images in a short time. If you are using our cameras for the first time, please read this chapter to get your first image quickly.

-  Capture Single Image
-  Capture Image Sequence
-  Record Movie
-  Capture Settings

### Saving Image

We support BMP/PNG/JPEG/TIFF image formats. You can change the default image save path in the shoot settings. Each camera has different resolutions based on the merge mode. In addition, Dpi determines the image output quality, and there are two types of 300/600 available in the software. You can choose the Saving Image to the actual work requirements.

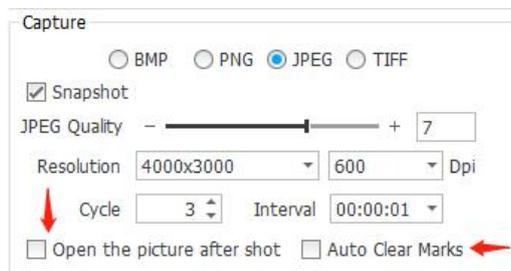
### Snapshot

Snapshot are unique to ViyeeStudio and can significantly save time.

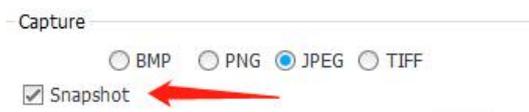
If you want a short interval between each image shot, and the image quality requirements are not high. You can check the Snapshot option in the shooting Settings (As shown in Figure 5-2), and click OK to use this function

### Open the picture after shot

If you need to process an image immediately after it is captured, you can use Open the picture after shot function in the Capture Settings (As shown in Figure 5-1).



5-1



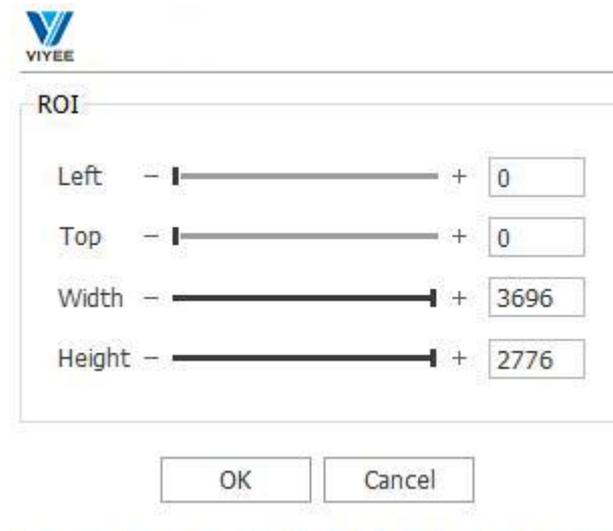
5-2

### Auto Clear Marks

If you need to clear the annotations in the preview screen after Capture the image, you can check this function, and the annotations in the preview screen will be cleared after Capture.(See Figure 5-1)

### ROI

If you only need to record an area of the image. You can check the ROI box. Click the Settings icon (See Figure 6-1. Again, you can customize the scope of the desired area by clicking the other options in the Settings. With ROI enabled, the selected area will be lossless with high quality recording and standard definition video compression to save network bandwidth and video storage space.



6-1

### White Balance

White Balance is an indicator describing the accuracy of the white produced by mixing red, green and blue in the camera. ViyeeStudio automatic White Balance feature can correct the color temperature and tone of the image with one click to ensure that the image will not be distorted by the influence of warm or cold light.

#### How to implement the White Balance function?

After confirming the image, you can click the White Balance icon and the software will automatically process the White Balance. After one-click White Balance, if the color temperature and tone still need to be fine-tuned, you can click the area White Balance icon and manually select the area with high white accuracy as a reference for image White Balance processing.

### Exposure/Gain

Exposure is the process by which a camera sensor is sensitive to light. Exposure has a great influence on image quality. If it is overexposed, the image will be too bright and lose details. If it's underexposed, the image is too dark, and details are also lost. Under the premise of not being

exposed, increasing the exposure time can make the image sharper. However, adjusting the exposure time affects the frame rate, and the longer the exposure time, the lower the frame rate. Gain represents the sensitivity of the camera sensor to light. The higher the gain, the more sensitive you are to light, which helps you shoot in low light, and it helps you capture your subject's surroundings without increasing the exposure. Increasing gain, however, requires amplifying electrical signals, which increases noise in the process.

### How to adjust the Exposure and Gain?

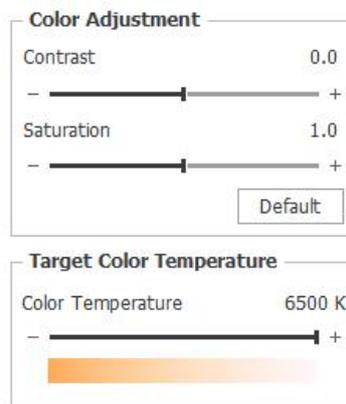
Both exposure and gain are applied when the Capture brightness conditions cannot be changed. Usually, adjust the exposure firstly if it's not overexposure. When the signal is very weak, the exposure cannot be increased indefinitely, and the noise will accumulate as the exposure time increases. In this case, the image quality can be improved by adjusting the gain appropriately. The auto adjust selection box in the toolset allows ViyeeStudio to automatically adjust the appropriate exposure and gain for you.

### Color Adjustment

By adjusting the contrast slider in the image, different brightness can be adjusted between the brightest white and the darkest black.

The color purity of the image can be adjusted by adjusting the Saturation of the slider. (Figure 7-1)

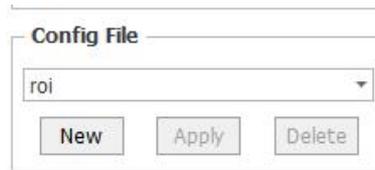
By adjusting the color temperature slider, the image presents the performance closest to the real color under different light sources (As shown in Figure 7-1).



7-1

### Config File

The Config File can save some actions for the current software Settings (As shown in Figure 7-2) The Config File is set to cancel Auto Exposure, which is cancelled when you switch to the current configuration.



7-2

## Image Flip

Image flip consists of vertical and horizontal flip, which targets the image in the current image display area. Again, actions are saved when they are taken.

## Focus Assist

Focus Assist is a reference function to help users determine whether the image focus adjustment has reached the best.

After clicking, a status bar will appear above the image (As shown in Figure 8-1). By adjusting the microscope or lens, the blue band is the best focal length position when the bar is full. After you reset the scene, you need to click Reset to refocus.



8-1

## Report

Displays all annotated data in the current image on the right. As shown in Figure 8-2, the slices and data are exported to Word and Excel for easy work statistics or late integration.

### Settings

The data display has custom options for length, radius, diameter, area, circumference, and Angle. Displayed data can also be customized. The items displayed including classified list, exported type, display sum, display average, display maximum, display minimum and display range.(See Figure8-3) Click the arrows to adjust the addition according to the requirements and use the up and down arrows to adjust the ordering.

ID	L(px)	R(px)
3	302	
2		110.887
1		404.361
Sum	302	515.248
Mean	302	257.624
Max	302	404.361
Min	302	110.887
Range	0	293.474
◀ ██████████ ▶		

8-2

**VIYEE**

Show Sum                       Show Mean  
 Show Max                       Show Min  
 Display Extremum

Selected Columns		Available Columns
L(Length)	←	
∠(Angle)		
R(Radius)	→	
D(Diameter)		
S(Area)	↑	
C(Circumference)		
a(Semi-major A...)	↓	
b(Semi-minor A...)		

**Word**

Use Template    Sample    Edit  
 Save as PDF

**Excel**

Use Template    Sample    Edit

**Category**

Use Category    Set

**Export Setting**

Auto Naming     Auto Clear Marks  
 Prefix    Document  
C:\VIYEE  
Open    Browse

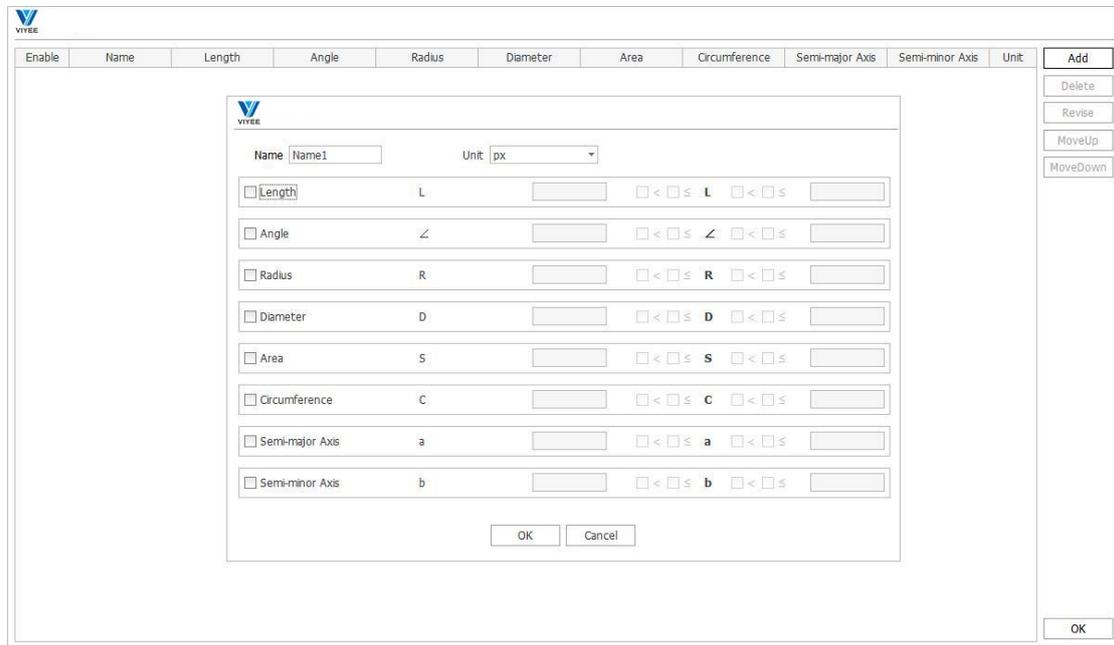
OK    Cancel

8-3

**Category**

Set the required classification rules. And filter the annotation on the image according to the set rules.

A rule with a length greater than 100px is set (Figure 9-1). In the statistical table of labels greater than 100px, the labels are marked in the form of  $\sqrt{\quad}$  (Figure 9-2), so that people can find the length labels greater than 100px at a glance.



9-1

ID	L(px)	Name1
1	1071	$\sqrt{\quad}$
		1
Sum	1071	
Mean	1071	
Max	1071	
Min	1071	
Range	0	

9-2

### Smart Edge Searching

During the measurement, Smart Edge Searching is turned on. When searching for the point, it will automatically adsorb to the strong boundary nearby.

### ID

When counting, turn on the serial number and display the ID on the counting image

### Measurement

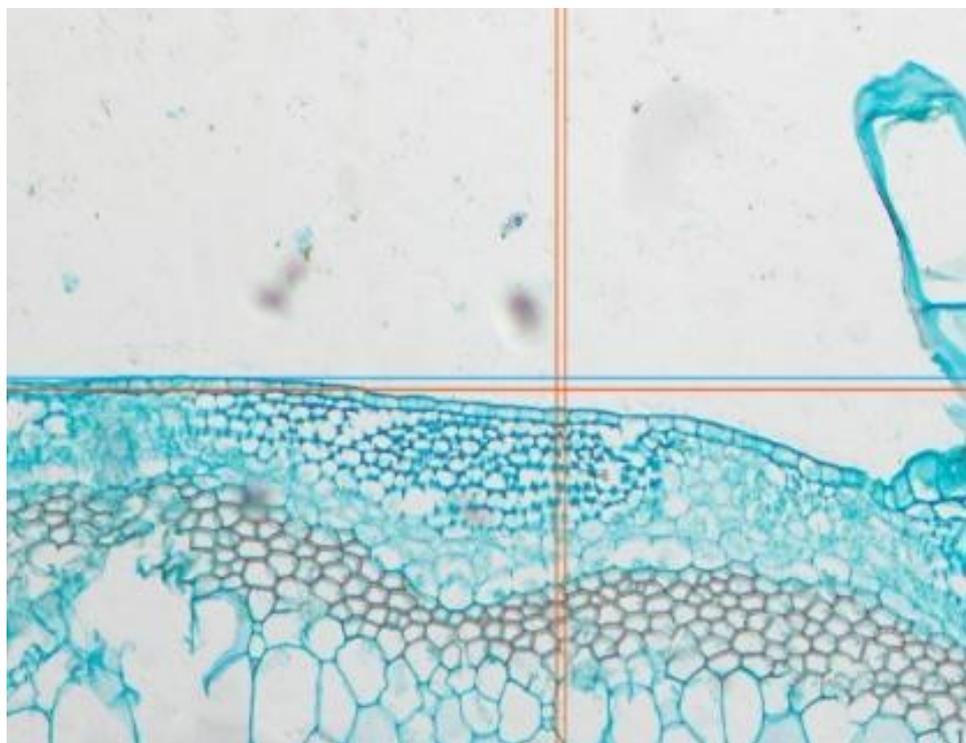
On the count page, when the icon is selected, the measured value is displayed on the counted image.

### Reference Line

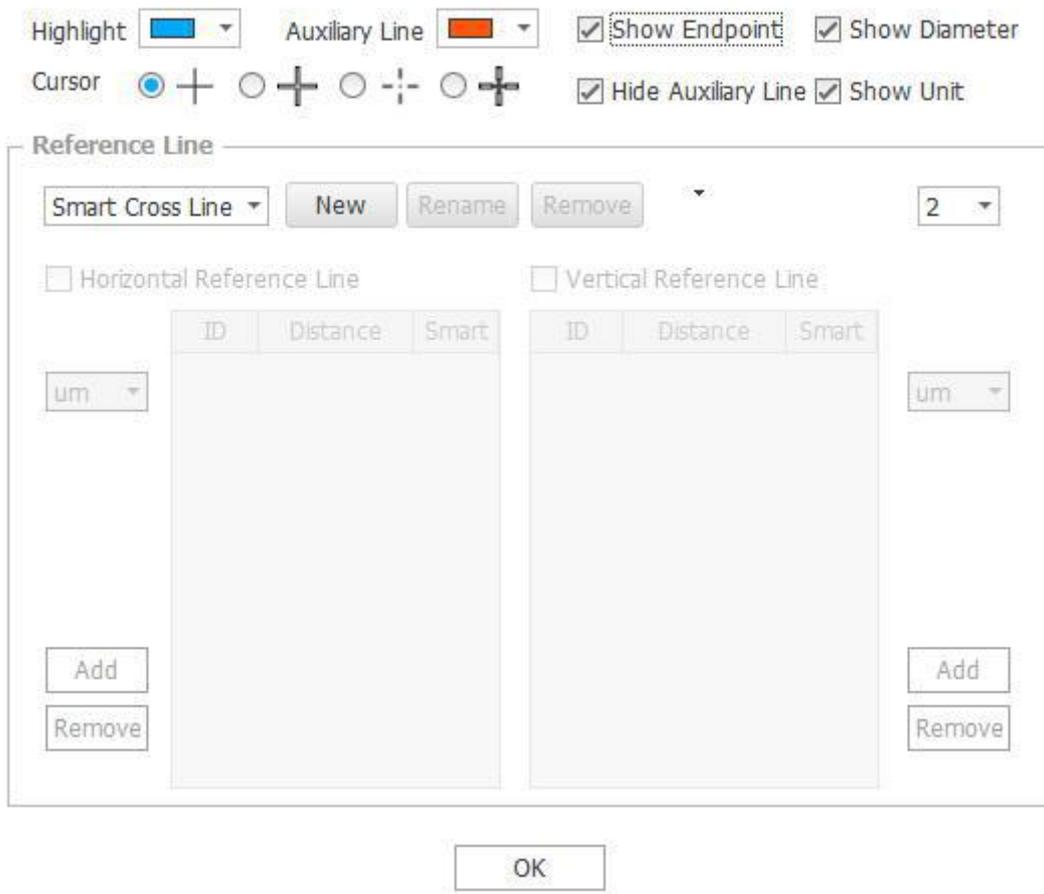
When the edge of the image is close to the Reference Line, a different color assistant line appears intuitively on the Reference Line. (See Figure 10-1)

#### How to set up an Reference Line?

Users can customize horizontal and vertical Reference Line to their needs, customize the required distance based on the baseline position, and manually change the units. (As shown in Figure 10-2)



10-1

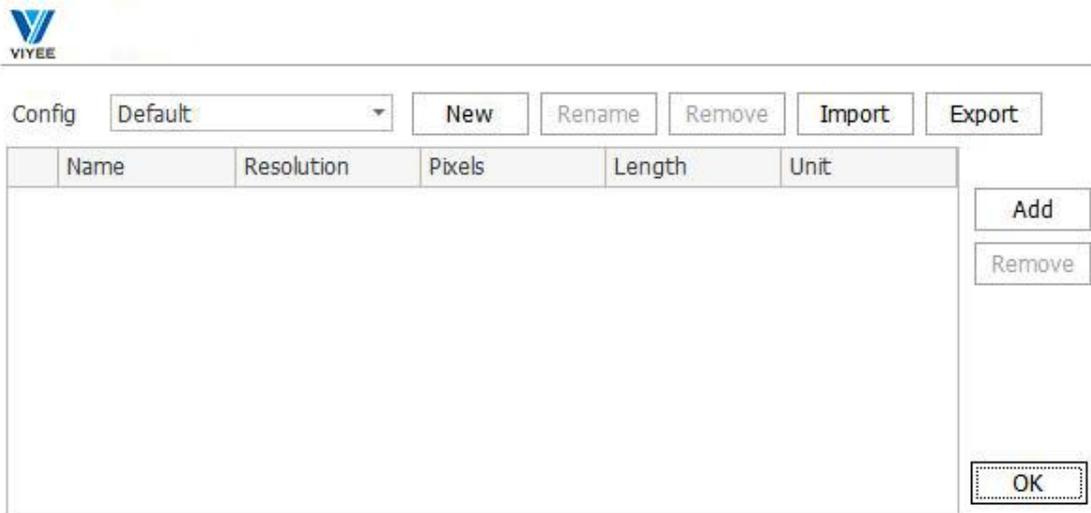


10-2

**Calibration** ▲

Calibration is the process of using a microscale to correct a standard length for subsequent measurements.

Click the Calibration management to enter the interface (As shown in Figure10-3). First, click New recipe, click Add in the current recipe, draw the required length according to the prompt, and then enter the interface As shown in Figure 10-3 again, enter the name, length and unit, and click OK. If used it during operation, select the corresponding scale name in the Calibration selection box.

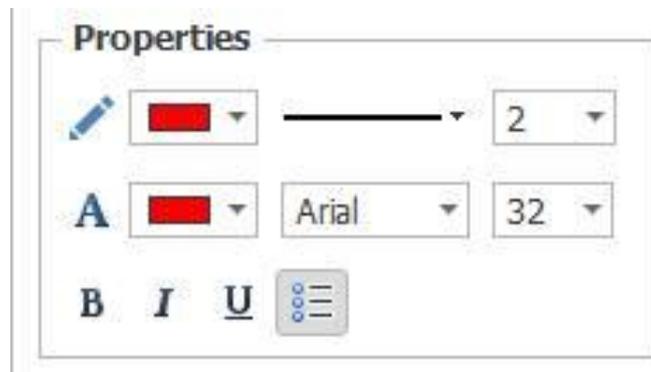


10-3

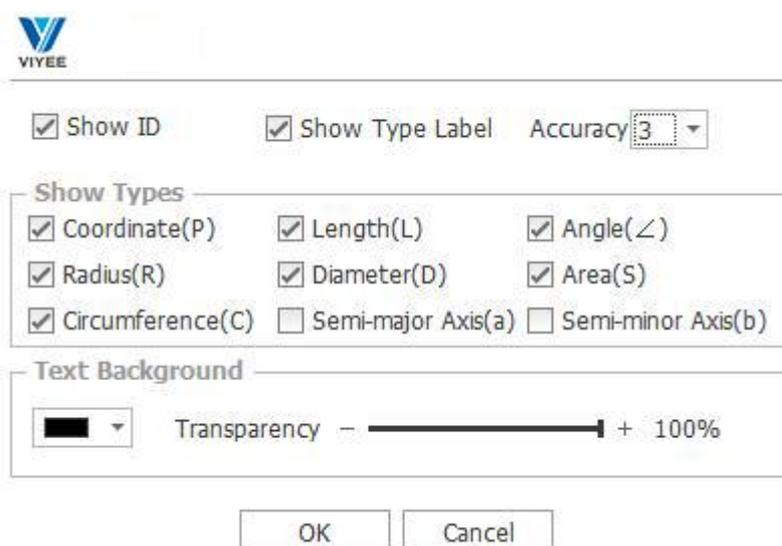
### Advance Properties

In the Advance Properties tool group, you can select the color size and properties of the brush and text (See Figure 11-1).

In advanced properties, all options are selected by default, where precision is the number of significant digits that are retained, and you can adjust the properties or precision to suit your specific needs. (See Figure 11-2)



11-1



11-2

## Annotation Tool

The functions of each annotation icon are as follows.

Move  : Move a marker that already exists on an image.

Coordinate  : Displays the coordinates of the current point.

Horizontal Distance  : Shows the horizontal distance between two points.

Vertical Distance  : Shows the vertical distance between two points.

Distance  : Shows the distance between any two points.

Continuous Distances  : Display the length of each segment and the total length of multiple segments

Polygon  : Display polygon area.

Rectangle  : Two points define a rectangle.

Ellipse  : Determine the center and width and height of an ellipse fixed.

Ellipse  : Draw a ellipse based on three points.

Circle  : Draw a circle with a center and radius

Circle  : draw a circle based on three points.

arc  : An arc is defined by three points.

Line- Line Distance  : Measure the distance between the midpoints of two line segments

Center Distance  : Calculate the distance between the centers of two circles

Center-Line Distance  : Calculate the distance between the center of the circle and the line segment.

Central Angle  : After the three points have determined the circle, draw the Angle with the center of the circle as the vertex.

Lasso  : Free drawing determines the area and perimeter of the graph.

- Dot Pitch : Calculate the vertical distance from a point to a line.
- Angle : Three points determine an Angle and calculate its included Angle
- Angle : Calculate the Angle between two segments.
- Text : Add text comments.
- Arrow : Draws arrows with straight lines.
- Profile : Draw the profile
- Clear : Clear all annotations.
- Count : Add number count
- Add Object : Manually sketch the cells to be counted on the image.
- Delete Object : Select the cell and delete the count object.
- Auto Split : Automatic cell cutting.
- Manual Split : Manual cell cutting

## 5. Image Editing

ViyeeStudio supports editing and annotation of images. This chapter describes the names and use of each tool group.

### Undo/Redo

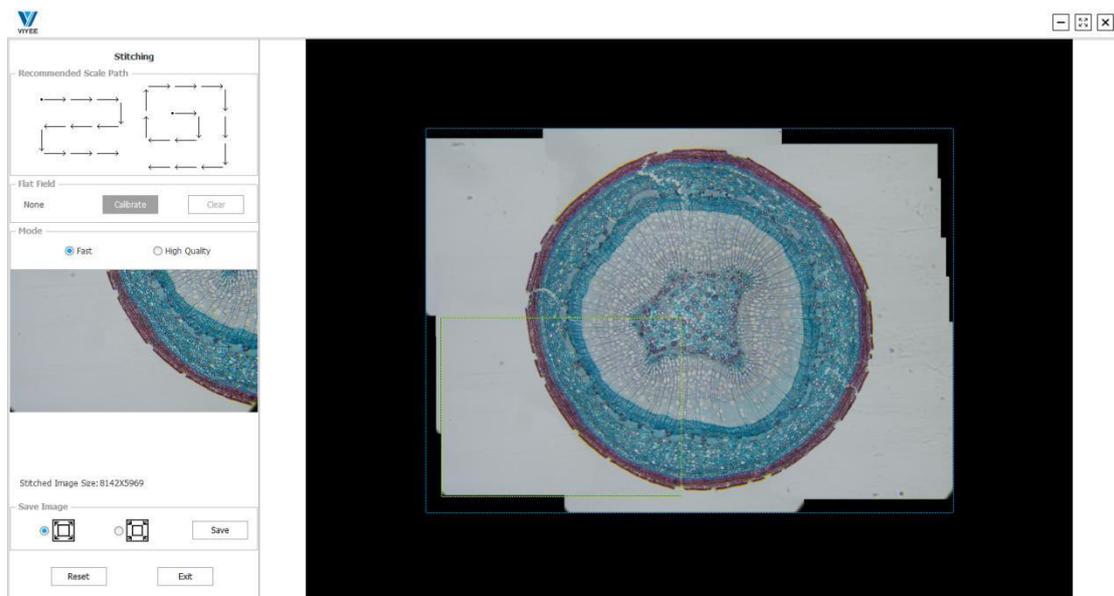
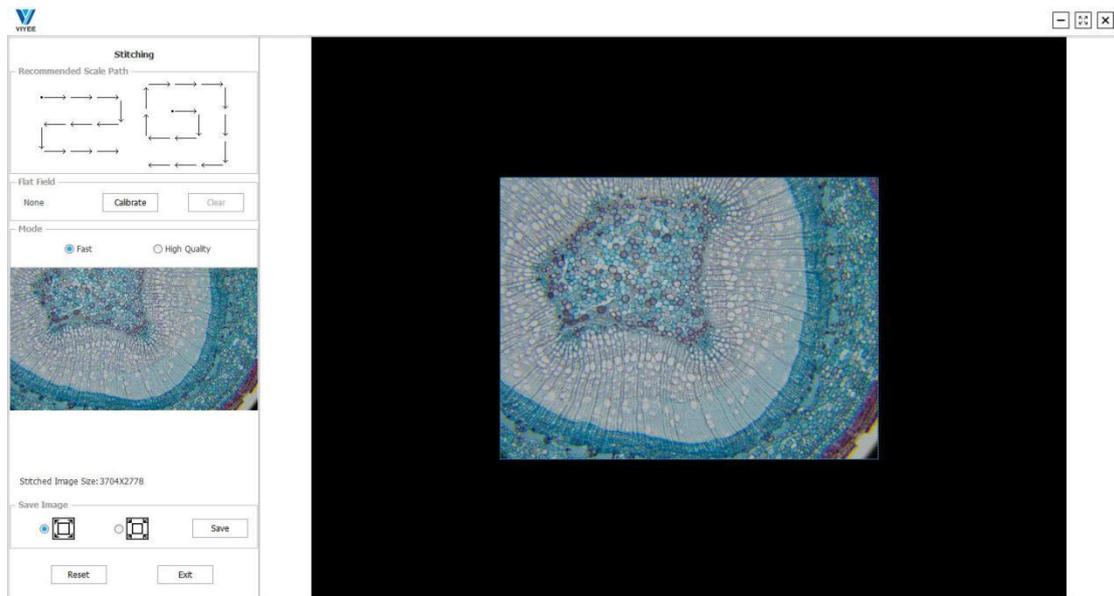
Support Undo and Redo return operations

### Stitching

Stitching refers to the stitching of images with limited field of vision into a large image on the carrier stage of mobile microscope (See Figure 12-1).

#### How to use Stitching?

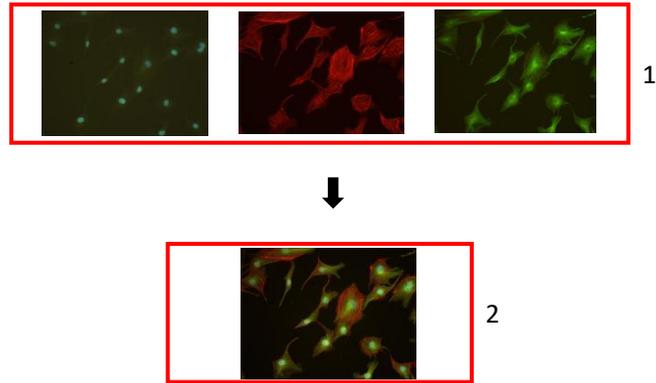
Click the Stitching icon, move the stage of the microscope slowly, and the image that is being stitched appears on the right. It is supported to click the reset button to reset. You can carefully choose the use of this feature based on your actual needs



12-1

## Overlay

ViyeeStudio Overlay combines a series of images into one image. It is usually applied to fluorescent images, which can be taken separately under different fluorescent channels and superimposed into one image (See Figure 13-1).

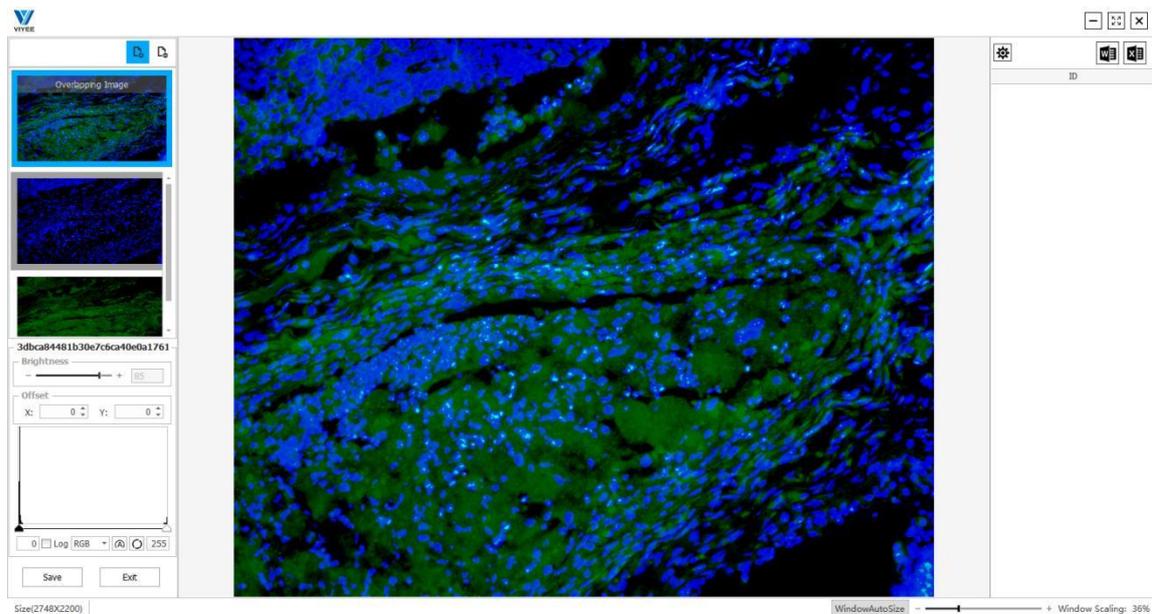


13-1

As shown in Figure 13-1-1, three fluorescent images can be seen. Figure 13-1-2 shows the fluorescence image superposed by these three images. The individual image may be a image of 8-bit or 16-bit.

### How to use Overlay?

Click the Overlay icon, a file selection box will pop up, select the image you want to overlay, add one or more pieces at a time, and click open to enter the interface (As shown in Figure 13-2). On the left side of the interface there will display the image selected to be superimposed. Each image can be selected by clicking, and the image displacement, brightness and histogram can be adjusted independently in the tool set at the bottom left. The image display area shows the image that has been superimposed. The top left side has the add and delete icon, support to directly add new images or delete the existing images. All superimposed images need to be of the same size.



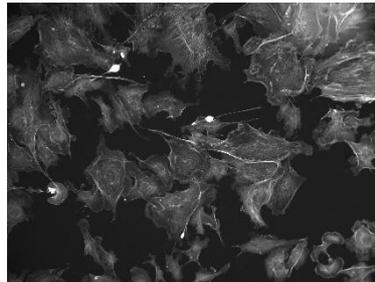
13-2

## Corp

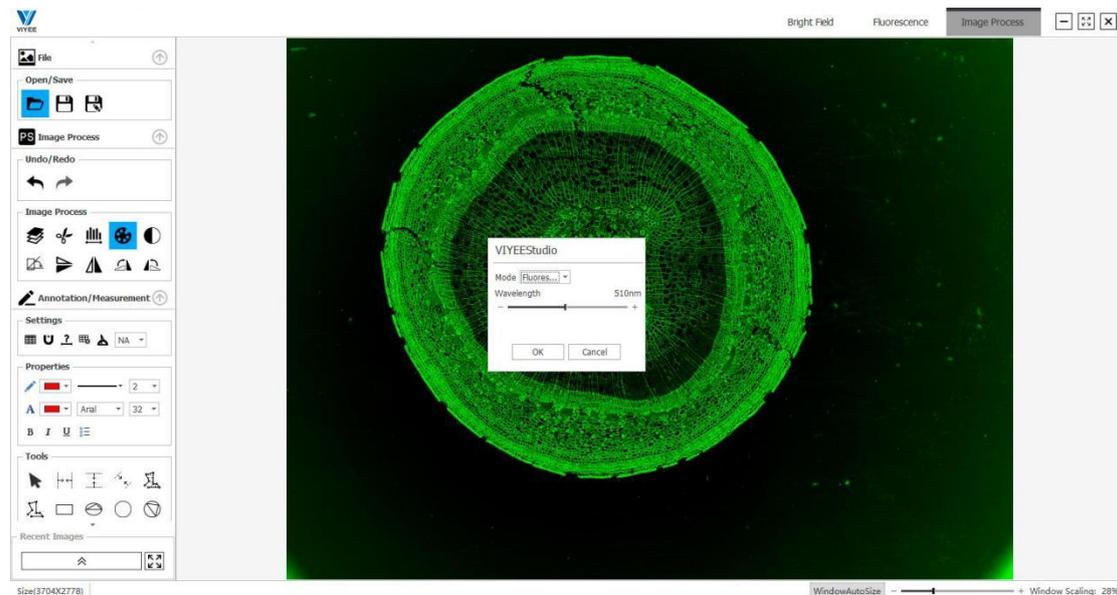
cut the currently open images.

## Pseudo Color

You can Pseudo Color by selecting wavelengths through the pseudo-color feature. As shown in the figure below (14-1), the original image is black and white (14-2), and the image color at the wavelength of 510nm is specified by Pseudo Color.



14-1



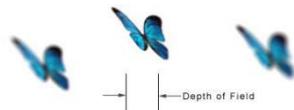
14-2

## Invert Color

You can Invert Color of an open image by inverting the color.

## Focus Stacking

Focus Stacking is the part of the field that gives a clear image. When focusing, only one plane is truly focused, and anything before or after this plane is not focused (See Figure14-3). When the depth of field of the material is large, it is impossible to bring clear image of every part into one image. The purpose of this function is to solve that problem.



14-3

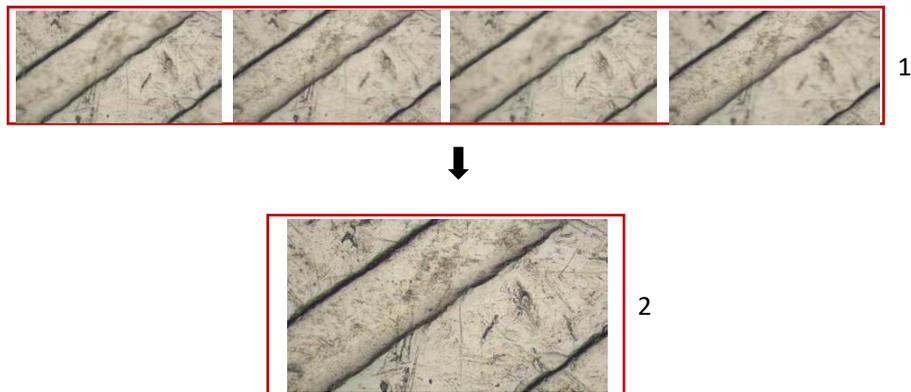


14-4

### How do I use the Focus Stacking?

Click the Focus Stacking icon, and the toolbar appears (As shown in Figure14-4). Click shoot, and shoot the images with different focal points. After the images are taken, begin multi focus. Among them, the fast compositing option can greatly improve the compositing speed, but the image quality is not high. Therefore, you can carefully choose the use of this feature based on your actual needs.

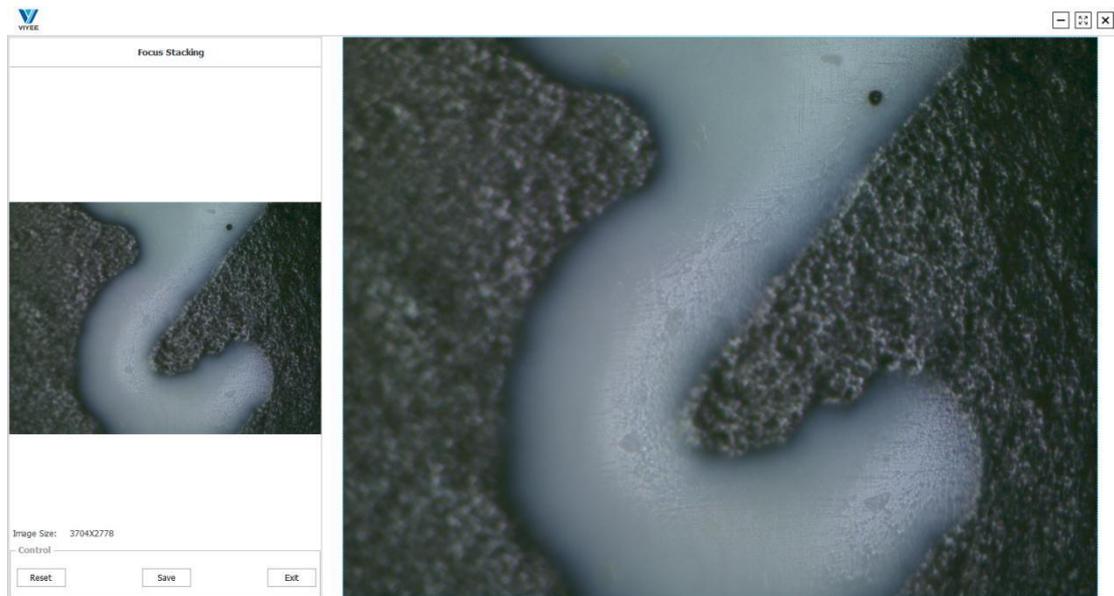
As shown in Figure 15-1-1, the four images are taken under different focal planes, and the four images in 15-1-2 are images after the function of multi-focus used. Each point in the composite image is focal.



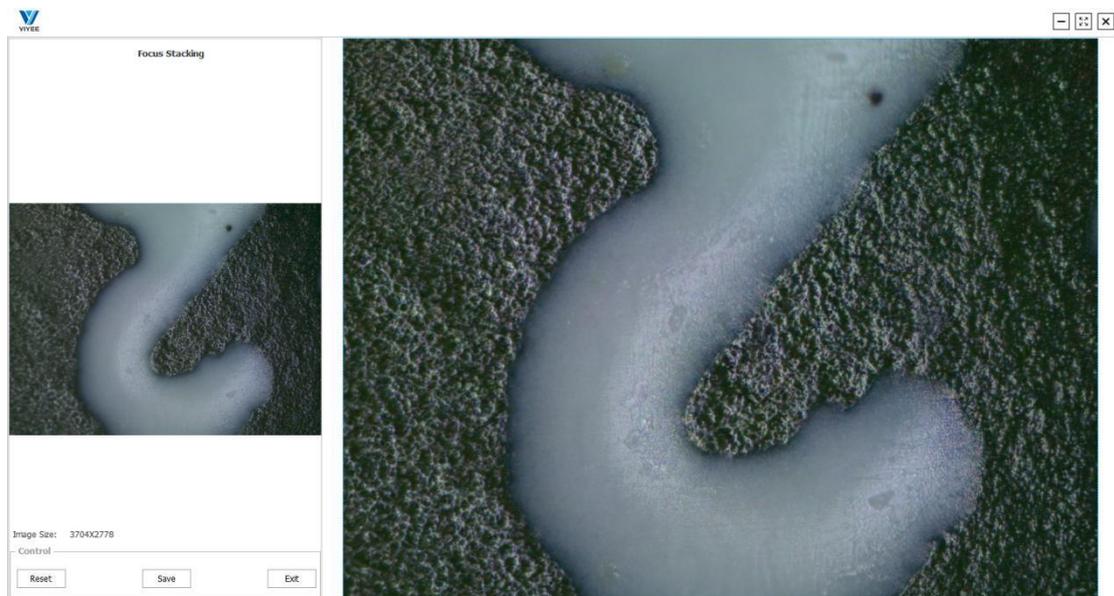
15-1

### Real Time Focus Stacking

Real Time Focus Stacking means we can adjust the focal length in real time, the focal points in the image are synthesized into an image, so that it is convenient to intuitively see the different depth of field of the object and finally synthesize an image with each point. As shown in Figure 15-2-1, the right side of the circuit board is in the focus state, while the left side is in the non-focus state. When we adjust the focus distance, the left side becomes clearer gradually. Step by step, each point is in focus.(See Figure 15-2-2)



15-2-1



15-2-2

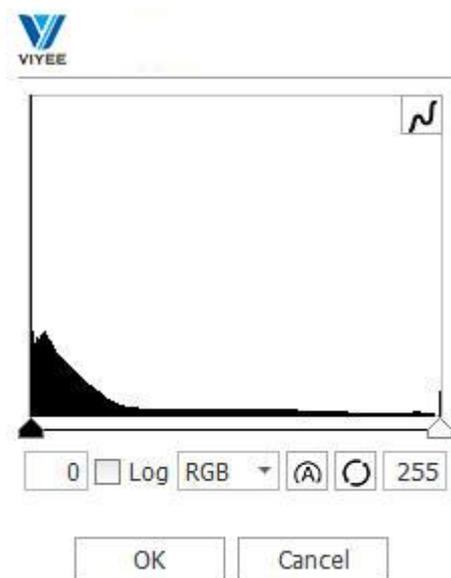
## Histogram

To understand histograms, you first need to understand brightness. The brightness of the image is divided into 256 values ranging from 0 to 255. The higher the value, the higher the brightness. Where 0 represents the darkest area of pure black, 255 represents the brightest pure white, and the Numbers in the middle are grays of varying brightness. A further division is to divide the brightness into five areas, namely black, shadow, middle tone, highlight and white. The histogram is a functional image, with the horizontal axis representing brightness values of 0-255. The vertical axis represents the number of pixels in the image corresponding to the brightness. The height of

the column in the histogram represents how many pixels in the picture are that brightness, thus the distribution and proportion of brightness in the picture can be seen. Histograms can be used to compensate for underexposure or overexposure.

**How to use histogram?**

Click the icon to appear the histogram (As shown in Figure 16-1), adjust the two black and white triangles, or directly fill in the value to adjust the histogram. Adjust histogram by auto and reset. Check Log to see an exponential histogram table.



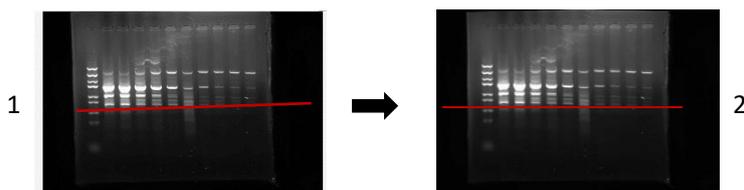
16-1

**Clockwise/ Counterclockwise 90 °**  

To rotate the image 90° clockwise or counterclockwise.

**Rotation** 

Rotation can be simply understood as manually setting a horizontal correction image baseline. This function can be applied to gel imaging and other applications requiring image level. Click Rotation icon, draw the correction line and parallel it to the desired horizontal direction. In example (As shown in Figure 16-2), the red line in 16-2-1 is the correction line and is placed in and set the horizontal direction. The corrected effect is shown in 16-2-2.



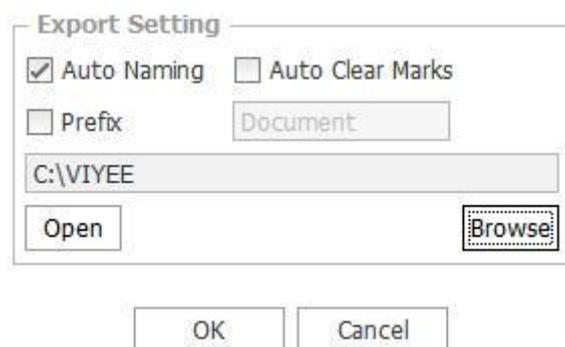
16-2

## 6. Export to Word/Excel

ViyeeStudio supports exporting image processing results in Word/Excel format. This chapter describes how to export and customize Word/Excel templates.

### Export Settings

The storage location and naming mode of exported files can be set according to requirements. Meanwhile, the function of automatically clearing the annotation is added. When you need to clear the annotation drawn by the current image after exporting files, the function of checking the word can be used. (See Figure 17-1)

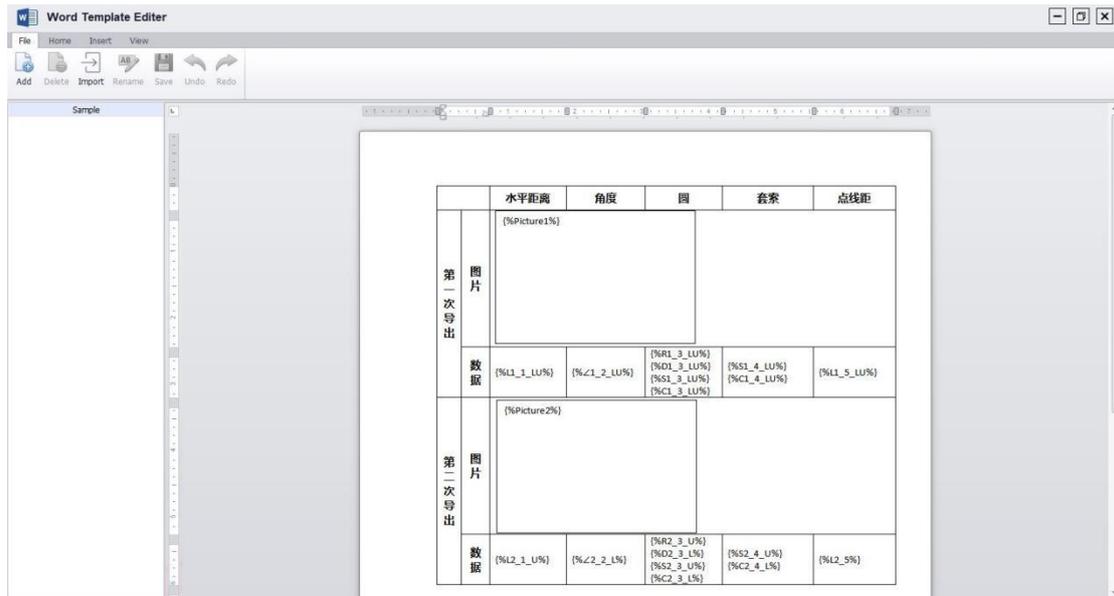


17-1

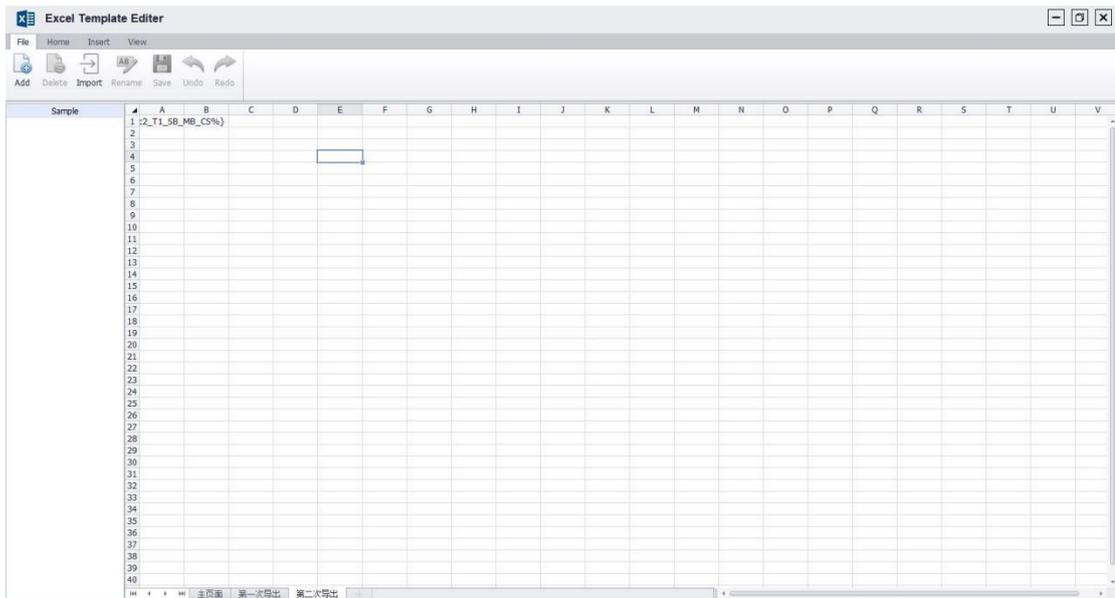
### Word/Excel Editing

ViyeeStudio provides users with the function of editing exported Word/Excel templates (See Figure 17-2 and 17-3).

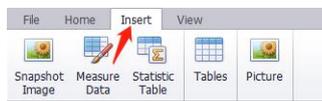
ViyeeStudio supports a series of editing functions for templates such as new, delete, import, rename, etc. (See Figure 17-4, 17-5) And insert the image, measurement data and statistical list. (See Figure 17-5)



17-2



17-3



17-4



17-5

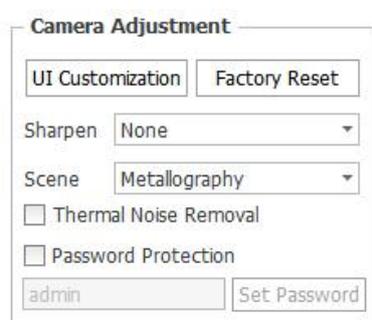
## 7. Others

### System Settings

ViyeeStudio supports three language versions, simplified Chinese, traditional Chinese and English. The factory setting contains the adjustment parameters of the product when it leaves the factory. If necessary, please contact your camera provider for the password.

### Camera Adjustment

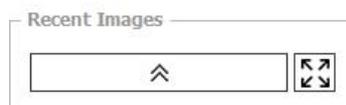
All ViyeeStudio functions can be seen in the custom UI. Check the "Thermal Noise Removal" button to eliminate the thermal noise of the image as much as possible. (See Figure 18-1)  
At the same time, users can choose the sharpening degree and the required scenario according to the actual situation



18-1

### Recent Images

Recent images are displayed in the lower left corner of the image editing interface (see Figure 18-2). Click the icon to preview all recent images in the folder. You can preview in a single column or click the icon in full screen to preview in full screen.



18-2

### Open and Save



In Image Process, ViyeeStudio supports Open, Save . You can open the image for post-editing, and save or save as.