



Advanced Image Processing in Metron



Click F11 on your keyboard for full screen display!

Dependent on your screen size, the menu buttons on the Database Browser screen may appear in one or two rows.



Advanced Image Processing in Metron

This online training session will provide you with the additional details about "Advanced Image Processing in Metron".

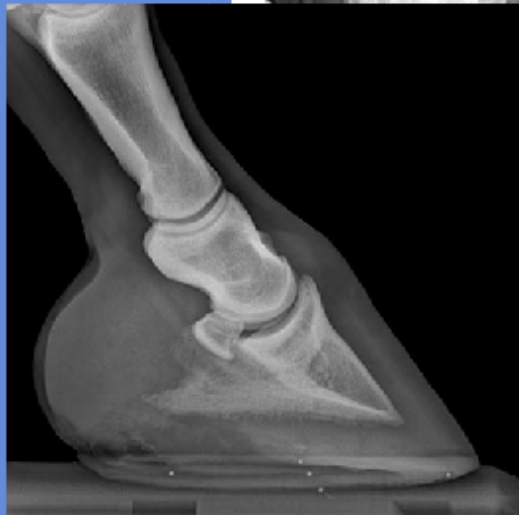
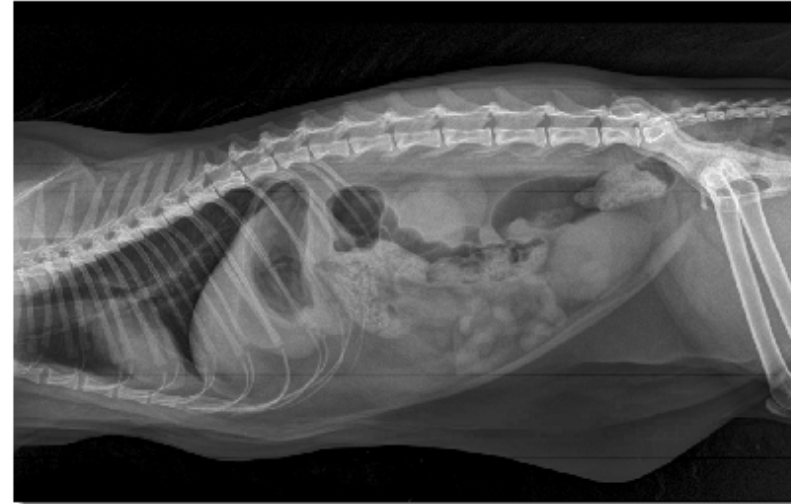


Click F11 on your keyboard for full screen display!

Dependent on your screen size, the menu buttons on the Database Browser screen may appear in one or two rows.

1

Advanced Image Processing in Metron



When bundled with imaging hardware, such as DR, CR, or CCD radiograph systems, Metron's goal is to produce an excellent image with little or no adjustments required by the user.

METRON
SUPPORT SERVICES

2

Advanced Image Processing in Metron

The topics listed below will be discussed in this online training session to help you with Advanced Image Processing in Metron.

1) "Tune" the Detail Filter

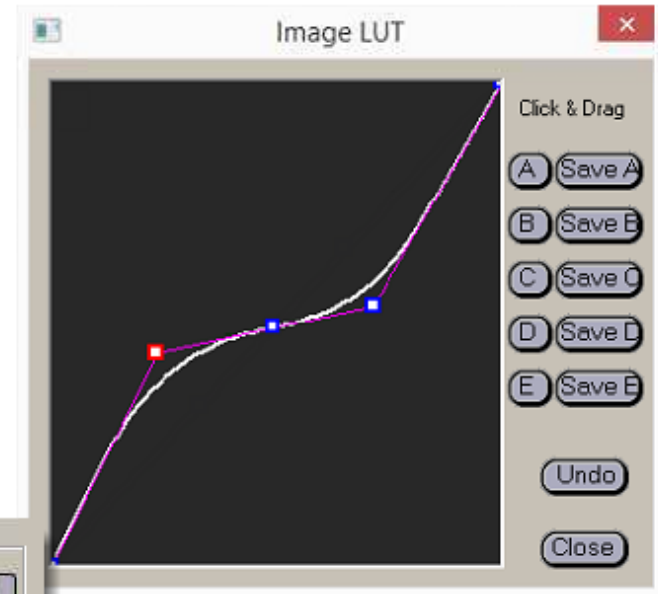
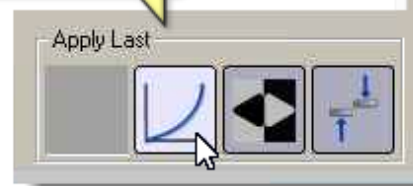


3

Advanced Image Processing in Metron

The topics listed below will be discussed in this online training session to help you with Advanced Image Processing in Metron.

- 1) "Tune" the Detail Filter
- 2) The LUT Curve

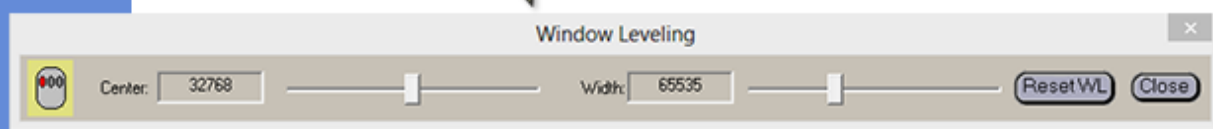


4

Advanced Image Processing in Metron

The topics listed below will be discussed in this online training session to help you with Advanced Image Processing in Metron.

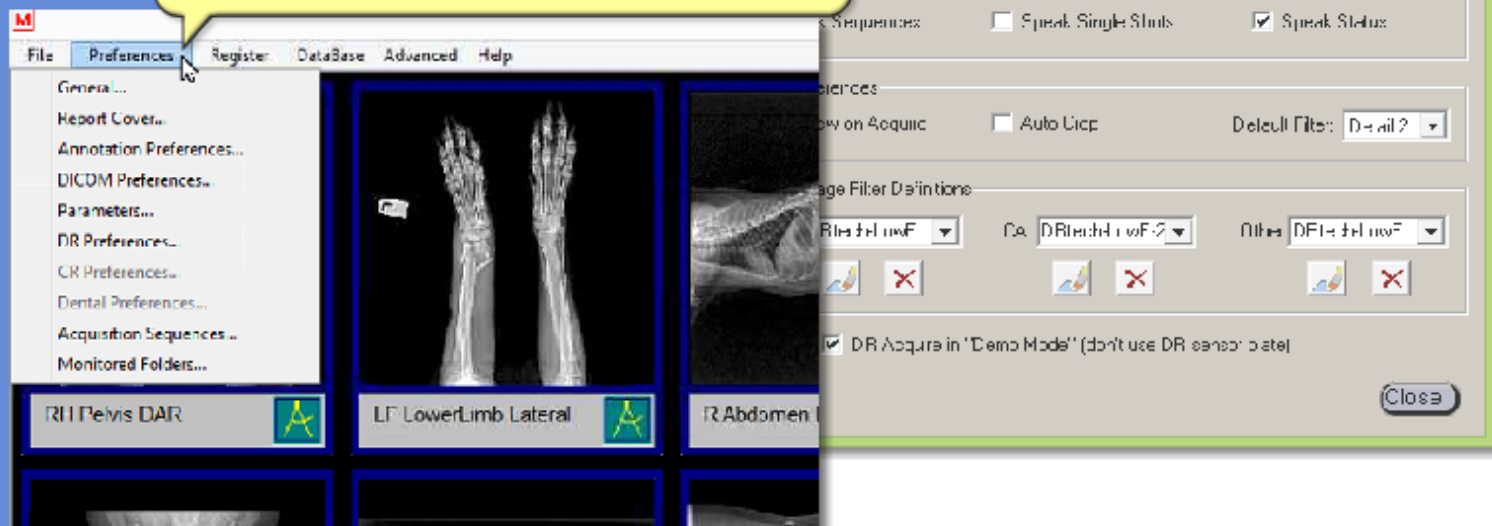
- 1) "Tune" the Detail Filter**
- 2) The LUT Curve**
- 3) Window Leveling**



5

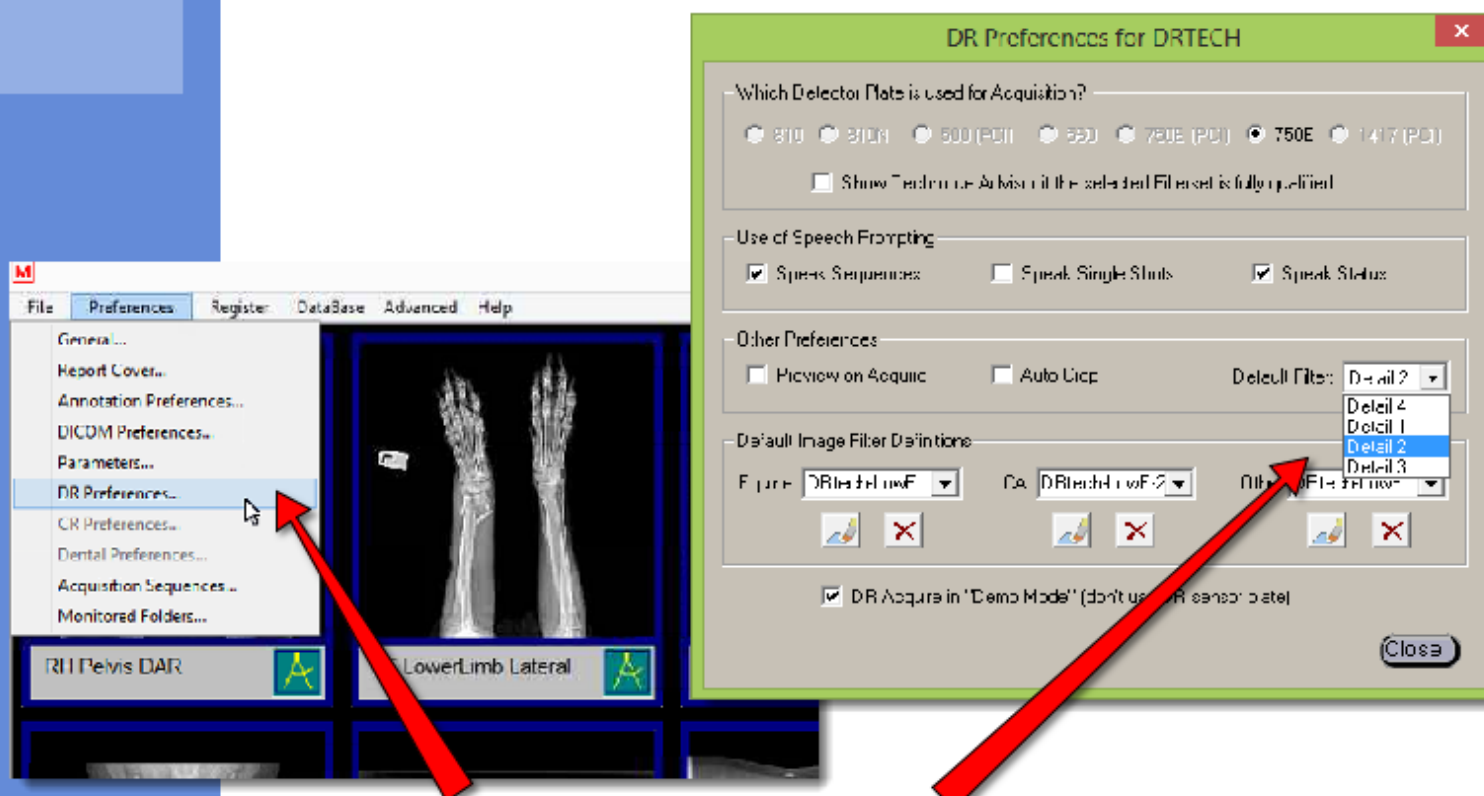
Advanced Image Processing in Metron

To change your default for the filter option, select 'Preferences' from the top Metron menu bar on the main database browser screen.



6

Advanced Image Processing in Metron



Move the cursor down to the **"DR Preferences..."**, select your mode preference 1 through 4.

METRON
SUPPORT SERVICES

7

Advanced Image Processing in Metron

Tune the Detail Filter

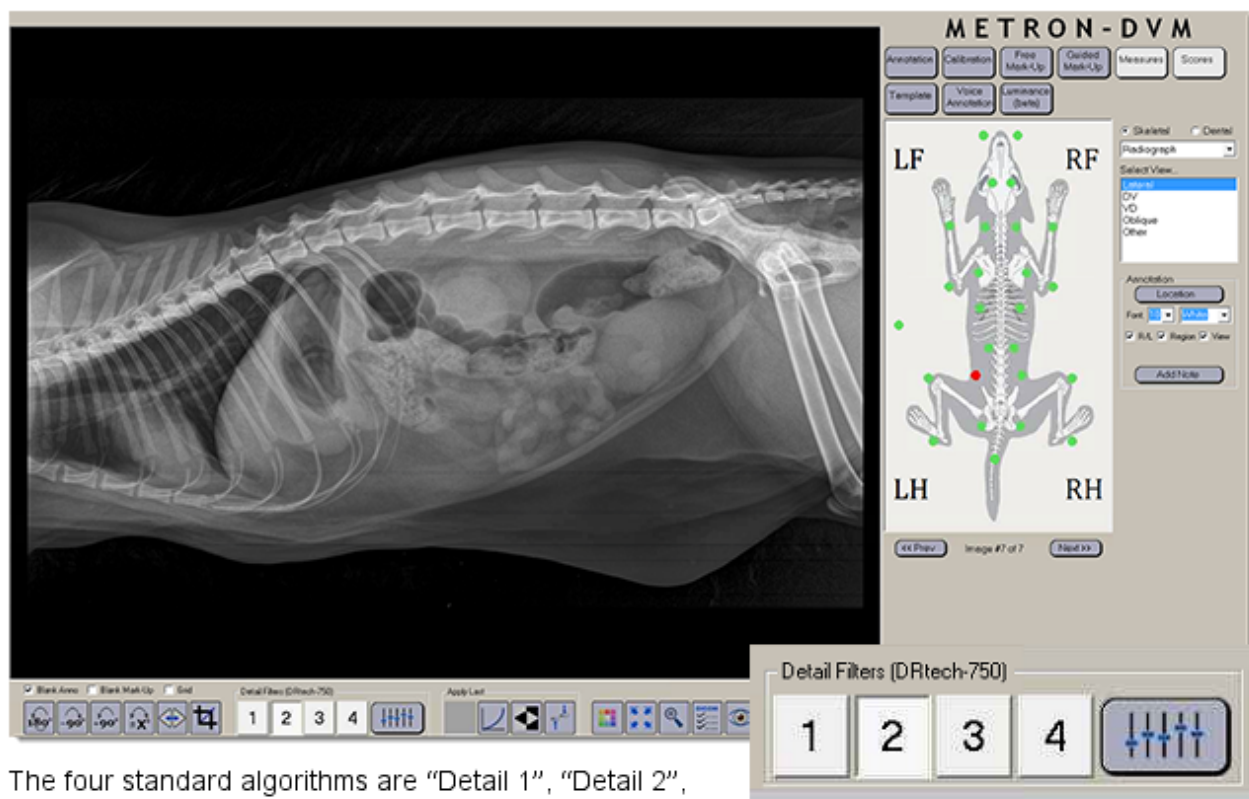


Since the definition of a good radiograph is subjective, the following slides will describe the four pre-set Metron imaging algorithms and how they can be further tuned if desired.

8

Advanced Image Processing in Metron

Tune the Detail Filter



The four standard algorithms are "Detail 1", "Detail 2", "Detail 3", and "Detail 4". Each give a different look to the image. The practitioner can select their preferred look and set up the corresponding **Metron Detail Filter** as the default.

METRON
SUPPORT SERVICES

9

Advanced Image Processing in Metron

Tune the Detail Filter

The large button to the right of the Detail Selection buttons is the **"Tune"** button.

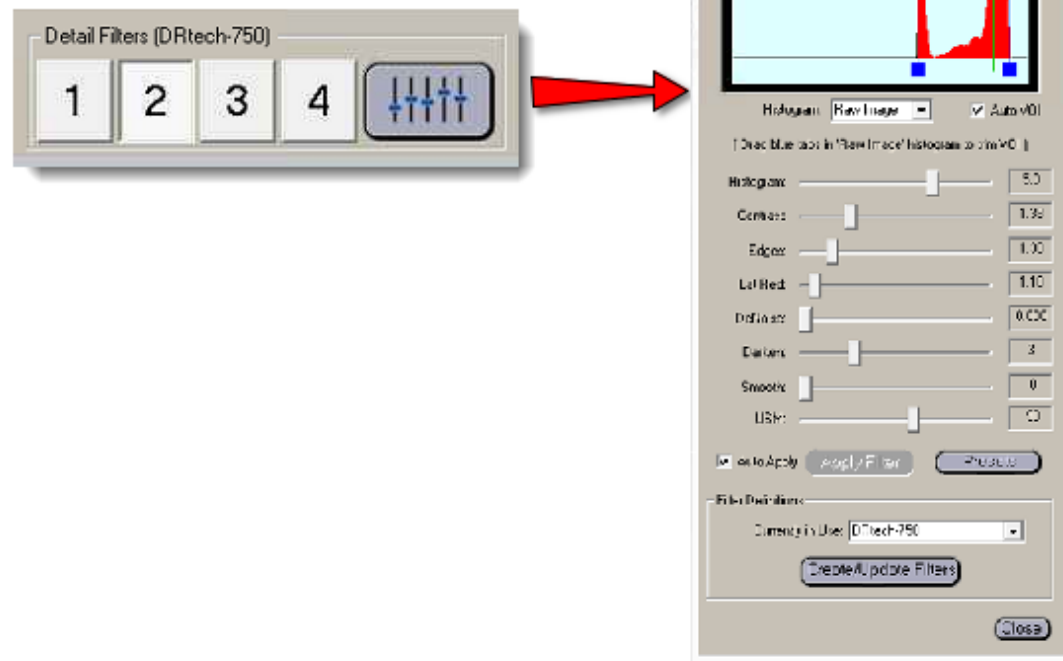


10

Advanced Image Processing in Metron

Tune the Detail Filter

Clicking on the **"Tune"** button brings up the Tuning panel for that particular detail filter.



METRON
SUPPORT SERVICES

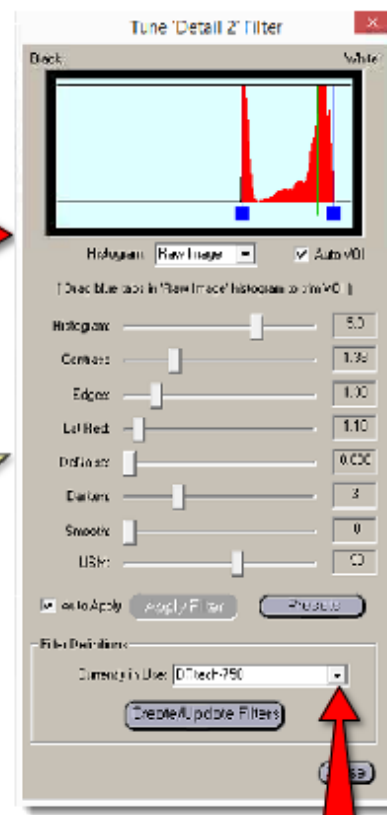
Advanced Image Processing in Metron

Tune the Detail Filter

Clicking on the **"Tune"** button brings up the Tuning panel for that particular detail filter.



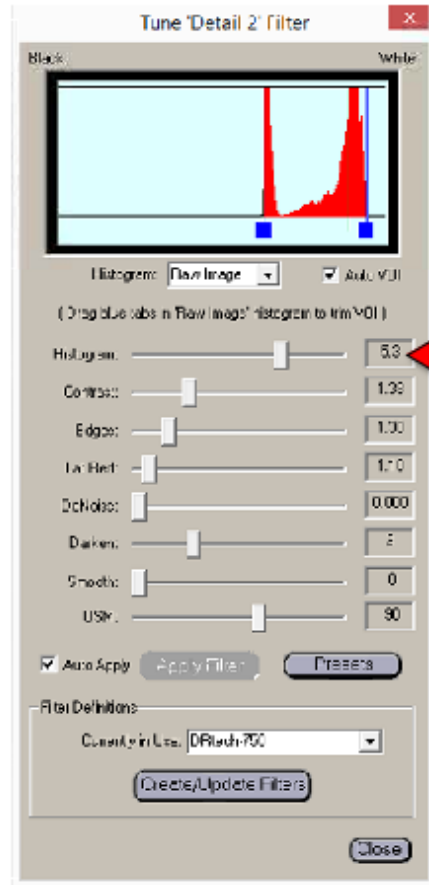
Detail 2 is shown in this example. There's no need to use the Tune button if you are satisfied with the default image of Detail 2.



12

Advanced Image Processing in Metron

Tune the Detail Filter



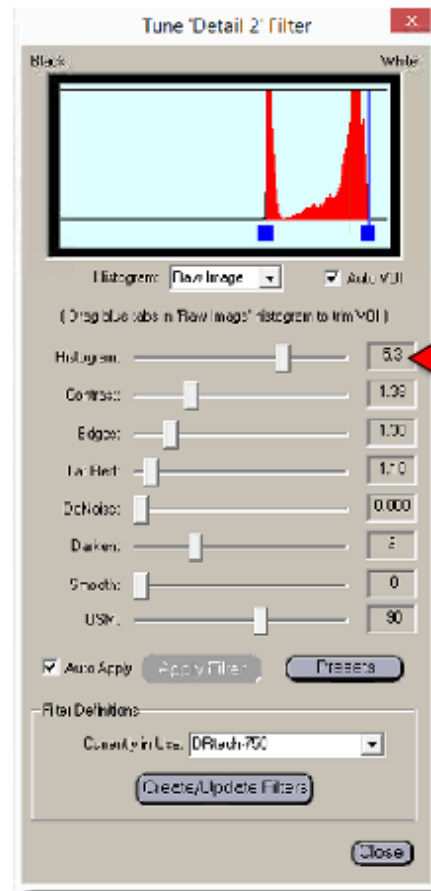
Histogram Control addresses several situations involving bright white areas in an image.

1. Dense Bone Areas Too White

13

Advanced Image Processing in Metron

Tune the Detail Filter



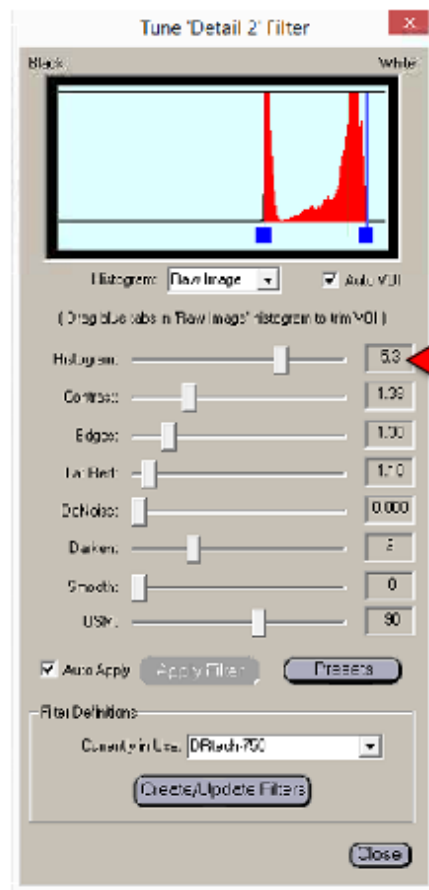
Histogram Control addresses several situations involving bright white areas in an image.

1. Dense Bone Areas Too White
2. **White Borders or other Artificial White Objects**

14

Advanced Image Processing in Metron

Tune the Detail Filter

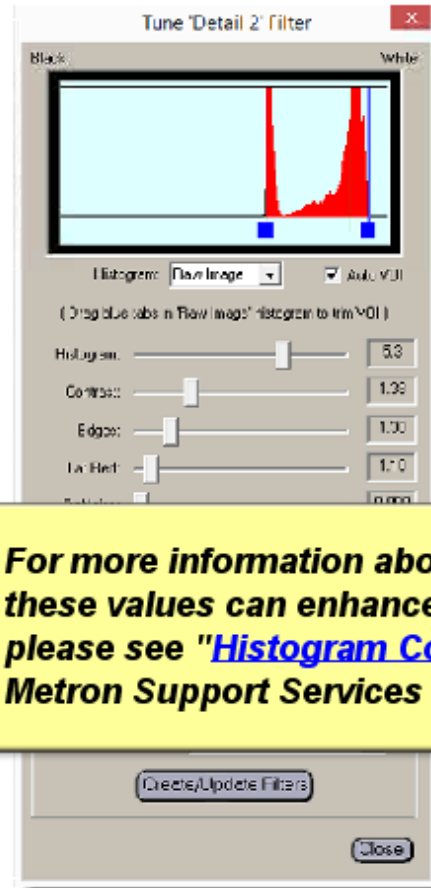


Histogram Control addresses several situations involving bright white areas in an image.

1. Dense Bone Areas Too White
2. White Borders or other Artificial White Objects
3. **Achieving Higher Contrast without Saturation**

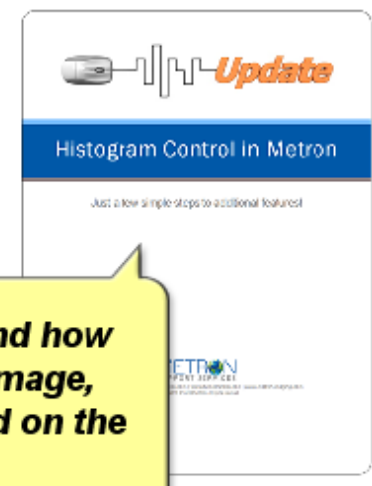
Advanced Image Processing in Metron

Tune the Detail Filter



Histogram Control addresses several situations involving bright white areas in an image.

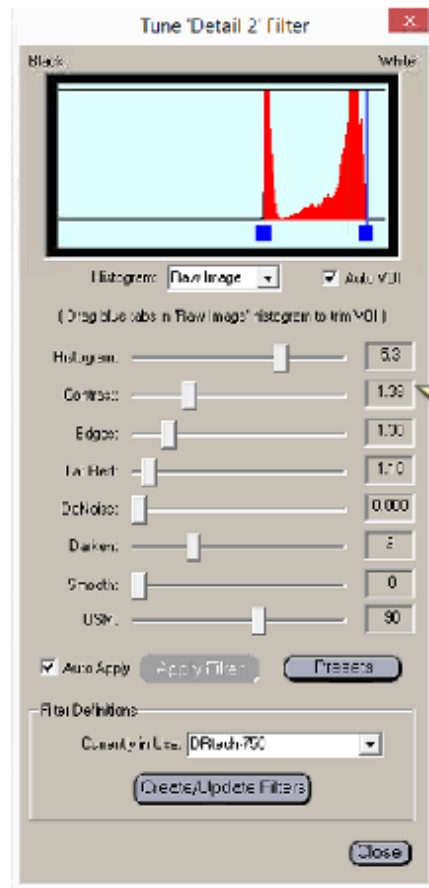
1. Dense Bone Areas Too White
2. White Borders or other Artificial White Objects
3. Achieving Higher Contrast without Saturation



For more information about Histogram Control and how these values can enhance particular detail in an image, please see "[Histogram Control in Metron](#)" located on the Metron Support Services website.

Advanced Image Processing in Metron

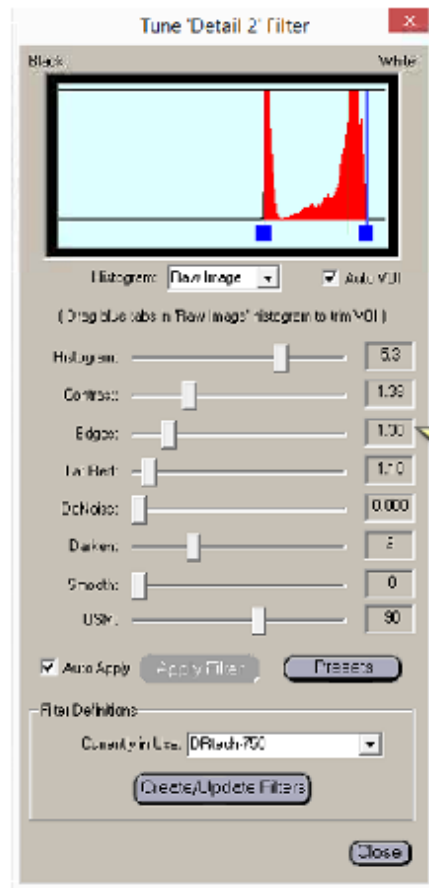
Tune the Detail Filter



Contrast: Sliding to the right increases contrast, but too much adds "graininess".

Advanced Image Processing in Metron

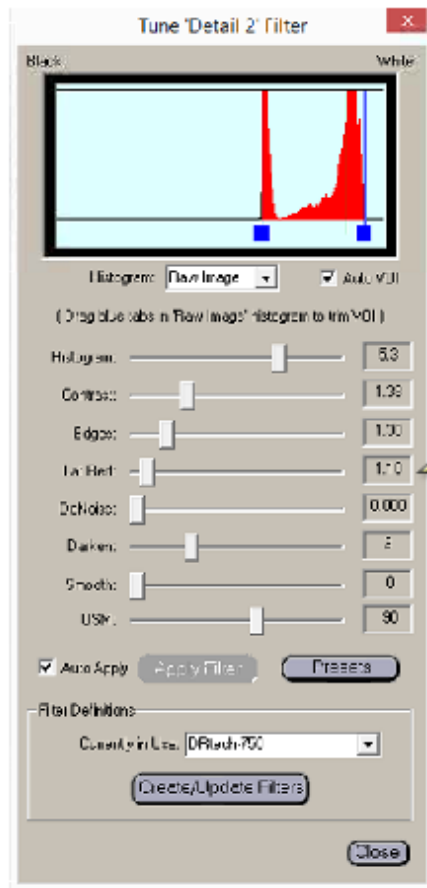
Tune the Detail Filter



Edges: Sliding to the right increases the sharpness of the edges.

Advanced Image Processing in Metron

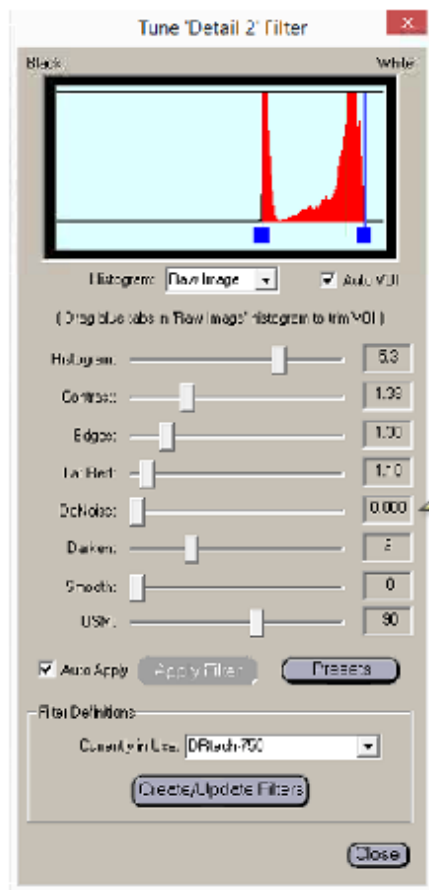
Tune the Detail Filter



Lat Red: Stands for “Latitude Reduction”. It is an advanced processing algorithm which reduces contrast in large features. More contrast is then available for smaller features. As a practical application, a bright white spot in thick bone can be reduced using this adjustment.

Advanced Image Processing in Metron

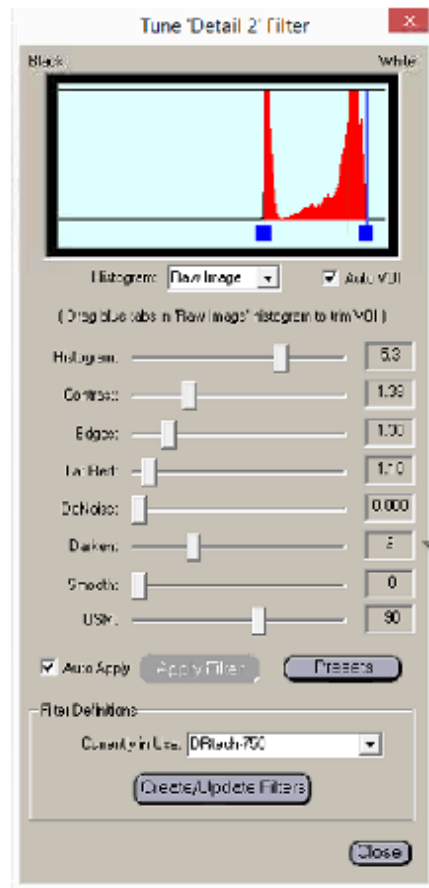
Tune the Detail Filter



DeNoise: Also called "Wavelet Denoising". This advanced algorithm attempts to smooth the image in a very clever way – reducing noise and graininess without blurring edges. Generally, just a small amount should be used.

Advanced Image Processing in Metron

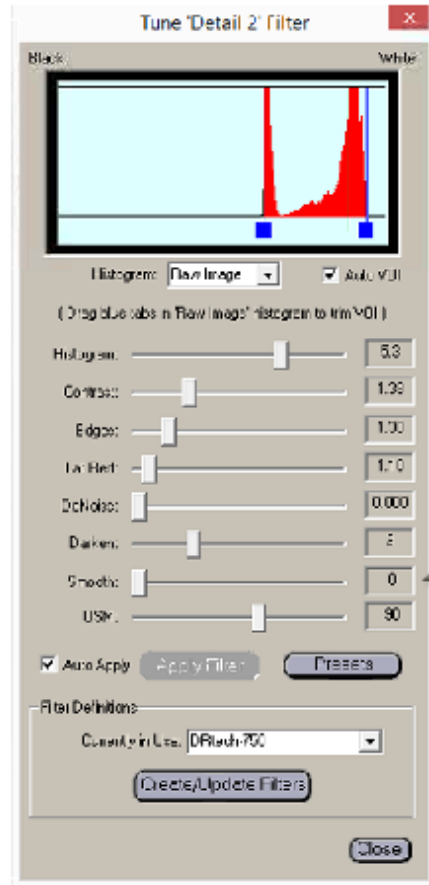
Tune the Detail Filter



Darken: Increase the number to darken the image.

Advanced Image Processing in Metron

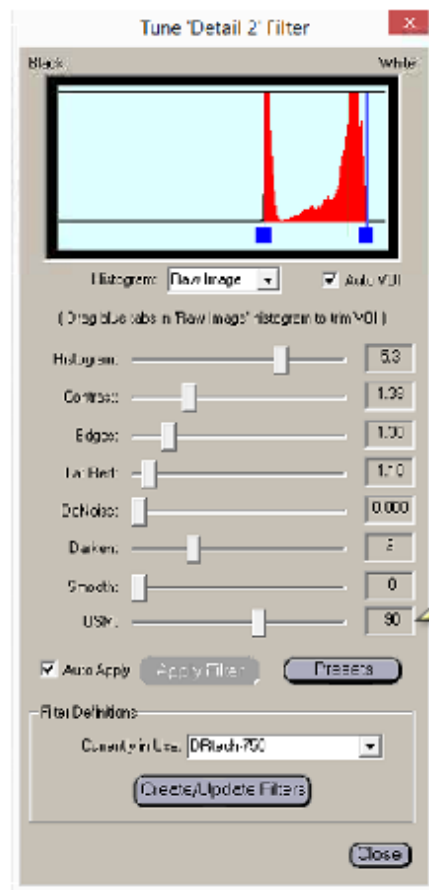
Tune the Detail Filter



Smooth: A small amount of smoothing can reduce noise or graininess in the image.

Advanced Image Processing in Metron

Tune the Detail Filter

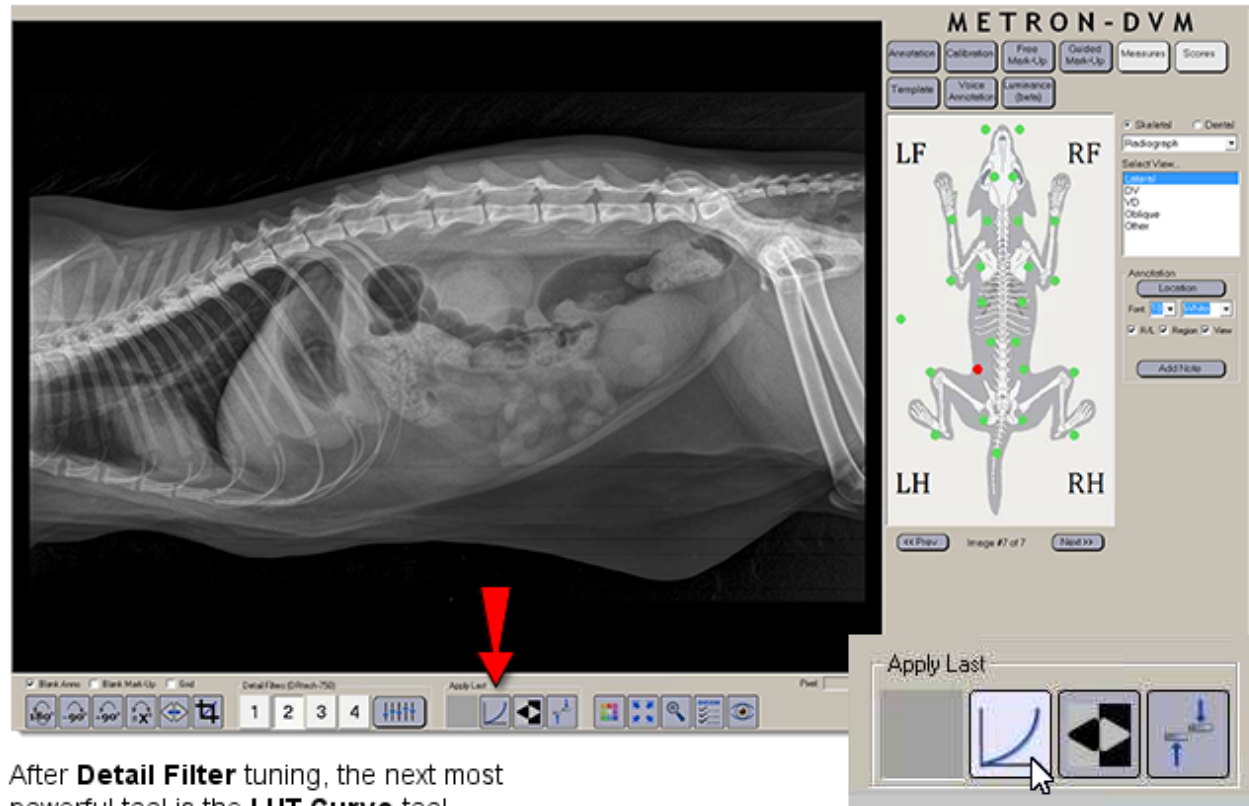


USM: Stands for
"Unsharp Mask Filter"
and is another method
for sharpening edges.

23

Advanced Image Processing in Metron

The LUT Curve | Look Up Table



After **Detail Filter** tuning, the next most powerful tool is the **LUT Curve** tool.

"LUT" stands for "Look Up Table".

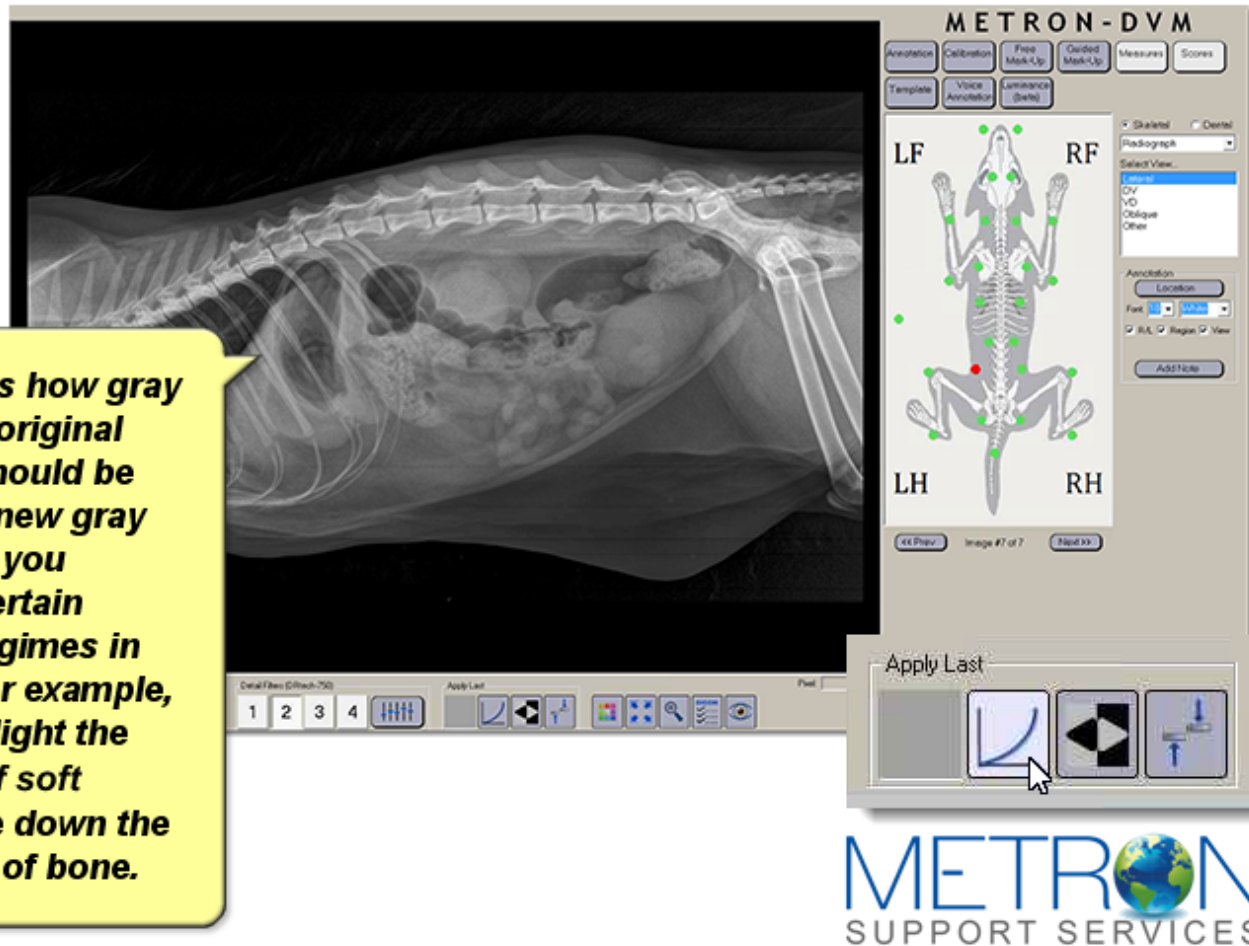
METRON
SUPPORT SERVICES

24

Advanced Image Processing in Metron

The LUT Curve | Look Up Table

LUT describes how gray values in the original radiograph should be mapped into new gray values. It lets you accentuate certain brightness regimes in the image. For example, you can highlight the weak grays of soft tissue or tone down the bright whites of bone.



25

Advanced Image Processing in Metron

The LUT Curve | Look Up Table

METRON-DVM

Annotation Calibration Free Mask-Up Guided Mask-Up Measures Scores

Template Voice Annotation Luminance (beta)

☒ Skatell ☐ Dental

Radiograph

Select View:

- Anterior
- DV
- VO
- Oblique
- Other

Annotation Location

Fast ☐ ☒ LUT ☐

☒ R/L ☒ Region ☒ View

Add LUT

LF RF

LH RH

Image #7 of 7

Click the LUT button.

Apply Last

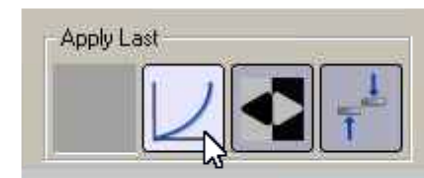
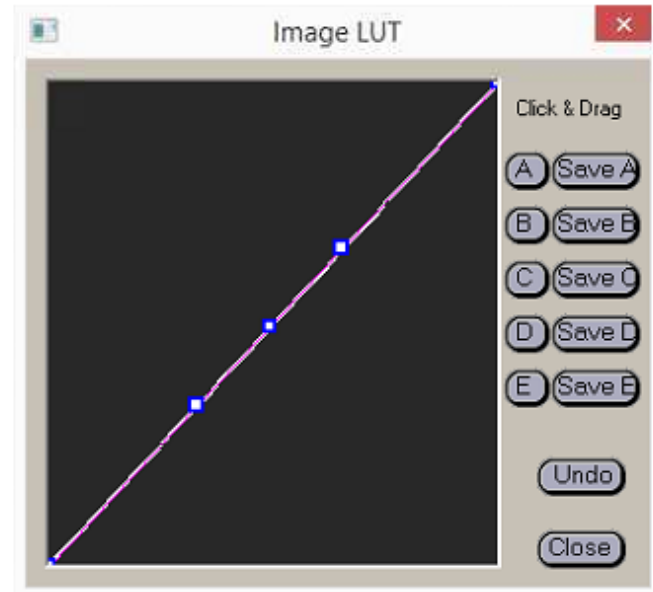
METRON
SUPPORT SERVICES

26

Advanced Image Processing in Metron

The LUT Curve | Look Up Table

The **LUT panel** initially looks like this - the straight line at 45 degrees means that input gray values (along the X axis) are mapped to gray values (along the Y axis) in a simple linear fashion not affecting the image.

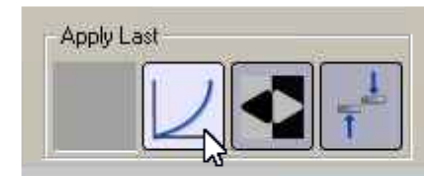
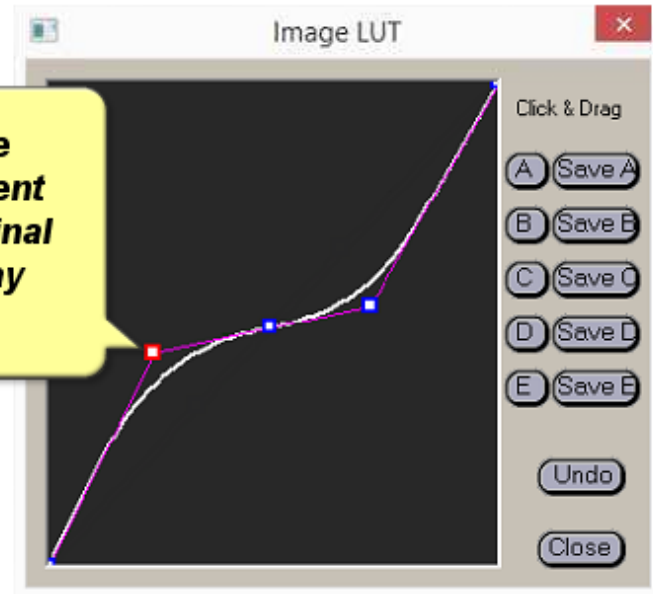


METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

The LUT Curve | Look Up Table

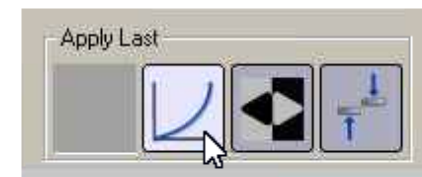
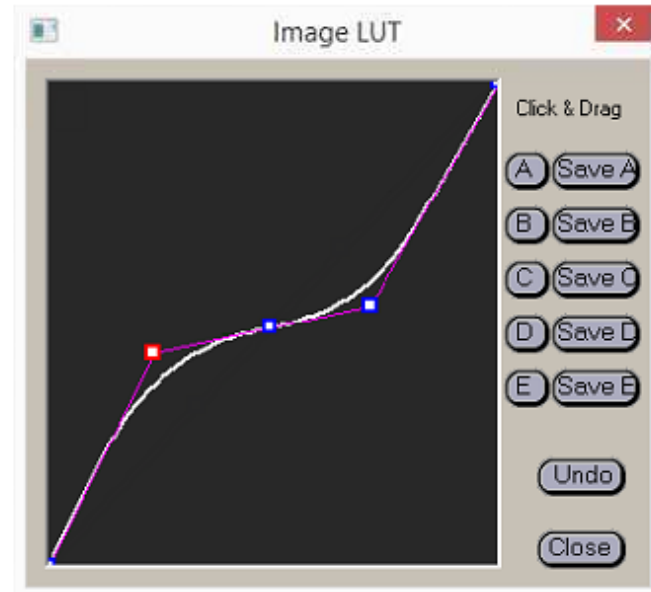
Using the mouse, drag the three control points to create a different shape curve, replacing the original linear line. For example, you may create a LUT curve shown here.



Advanced Image Processing in Metron

The LUT Curve | Look Up Table

The image changes as you drag the points. **The basic rule is:** Where this curve is the steepest, you are “stretching out” the gray values, helping to see details with improved contrast. Since the curve connects the lower left to the upper right, always increasing from left to right, you cannot enhance all brightness levels. If you increase steepness in one area of the curve, you need to flatten the other area. A trade-off must be made.

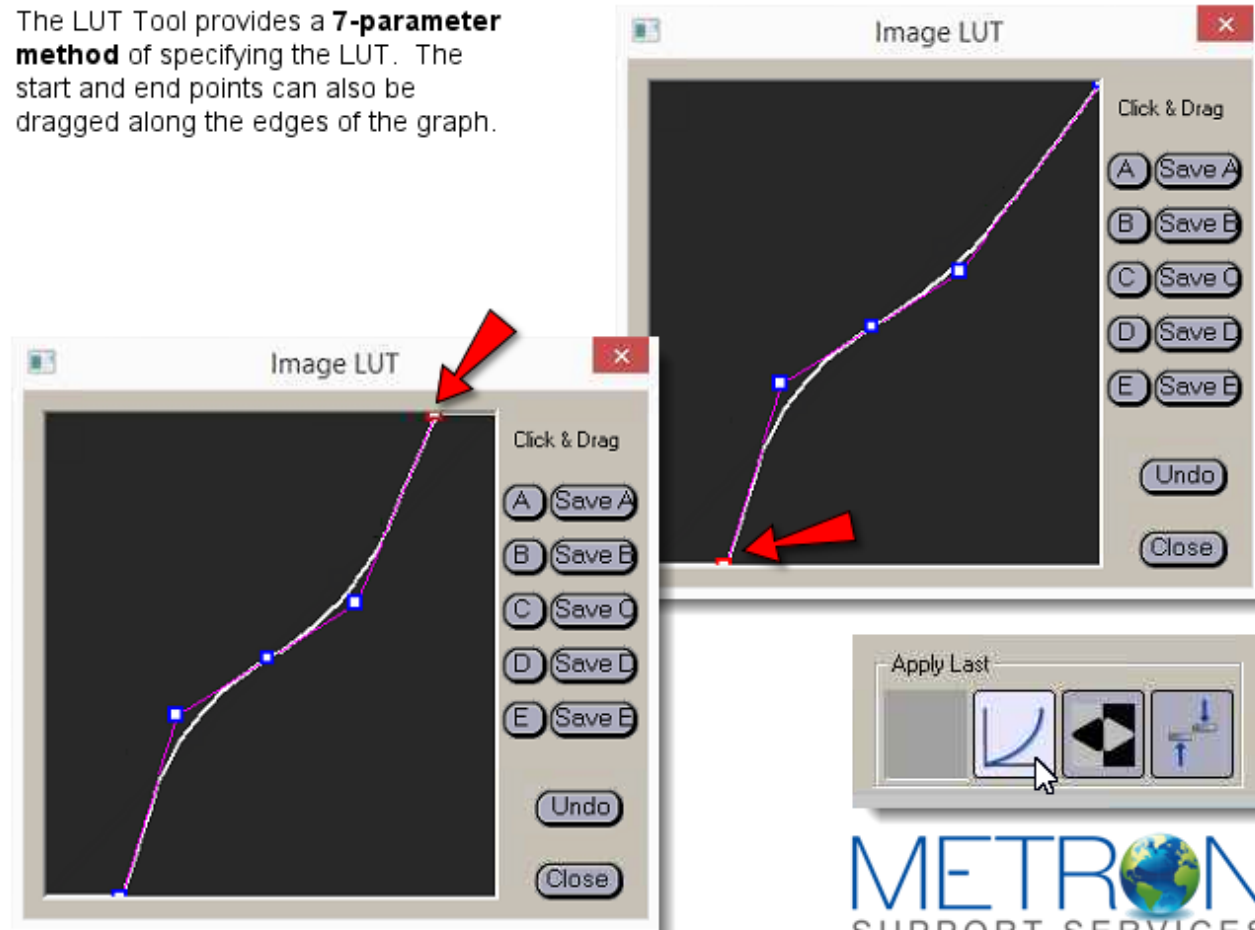


METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

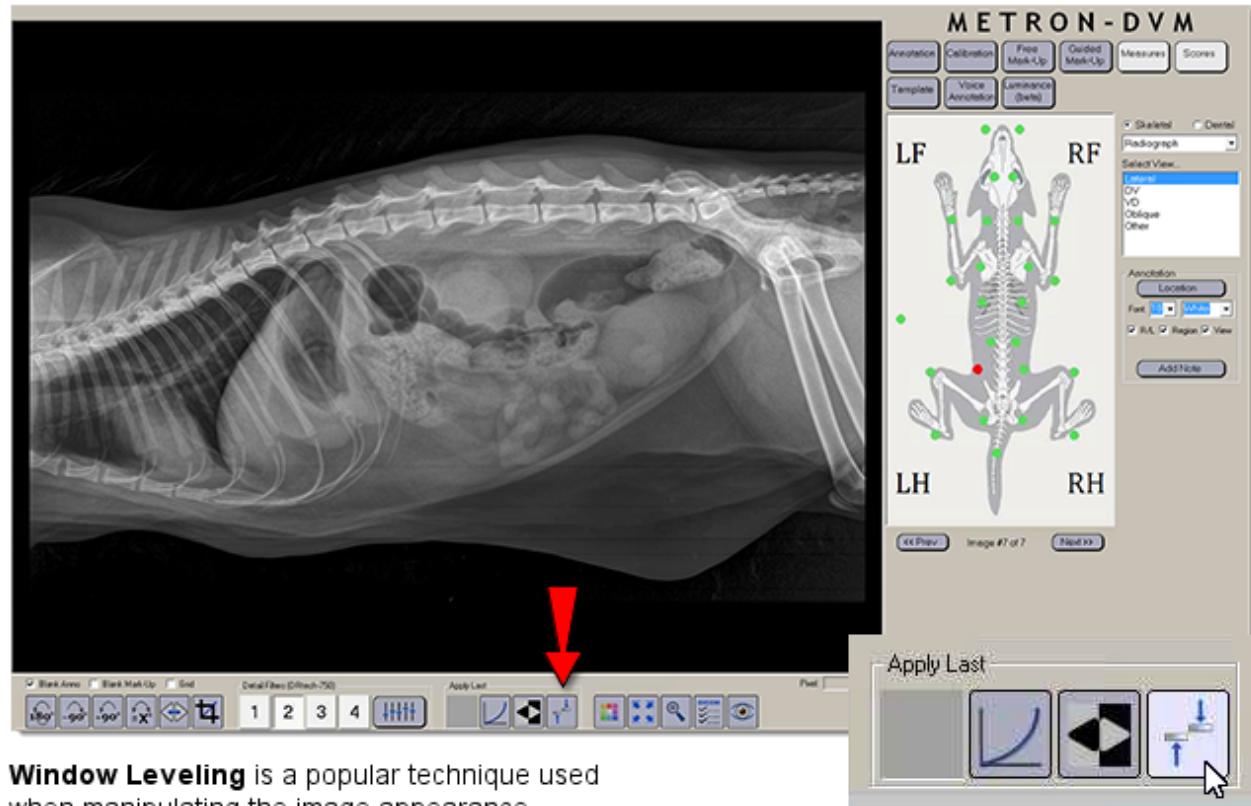
The LUT Curve | Look Up Table

The LUT Tool provides a **7-parameter method** of specifying the LUT. The start and end points can also be dragged along the edges of the graph.



Advanced Image Processing in Metron

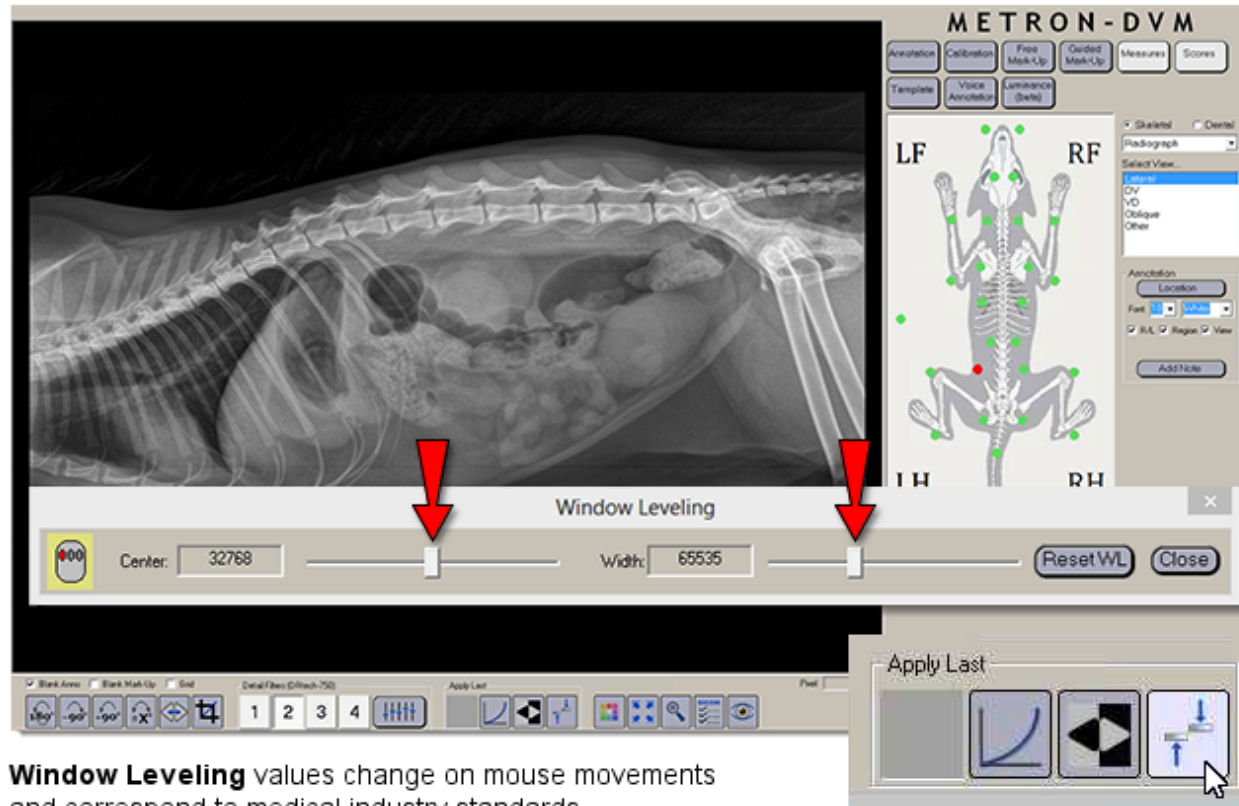
Window Leveling



Window Leveling is a popular technique used when manipulating the image appearance.

Advanced Image Processing in Metron

Window Leveling

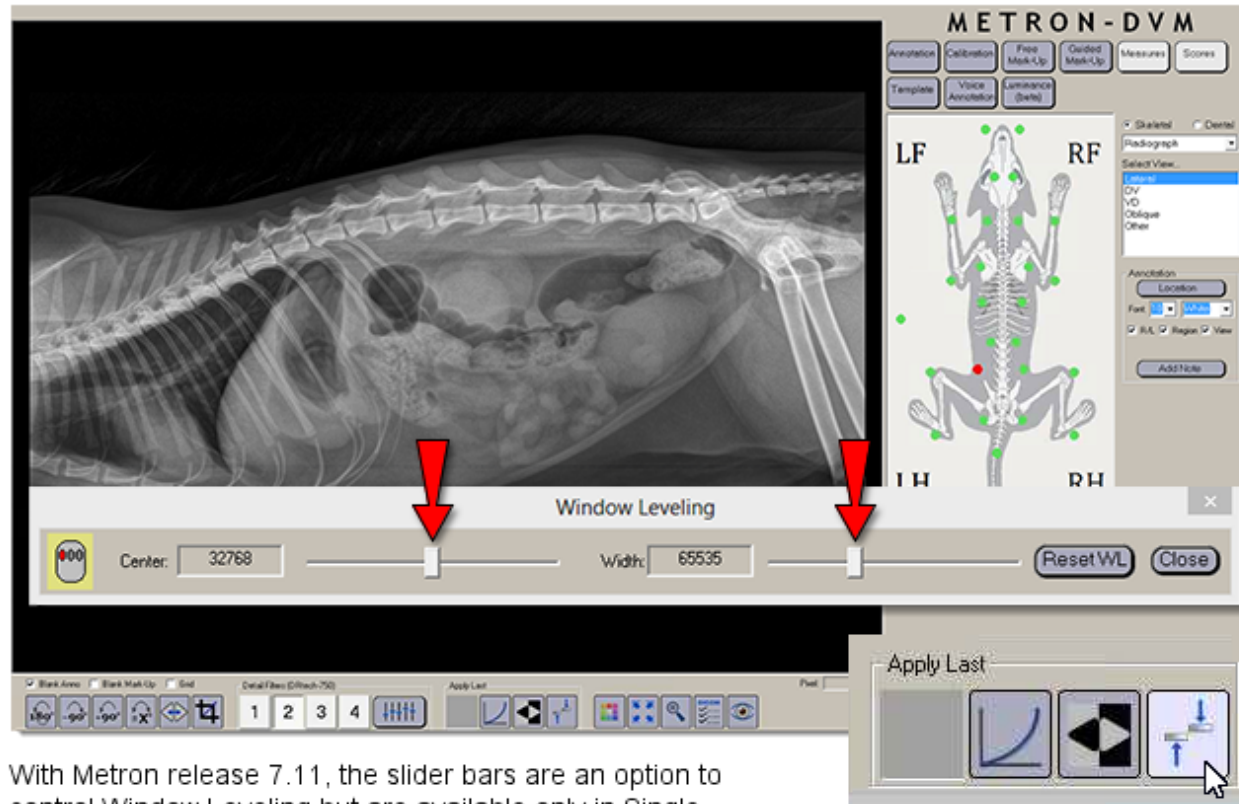


Window Leveling values change on mouse movements and correspond to medical industry standards.

METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

Window Leveling



With Metron release 7.11, the slider bars are an option to control Window Leveling but are available only in Single Image View as displayed here.

METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

Window Leveling



Embedded SWF Movie

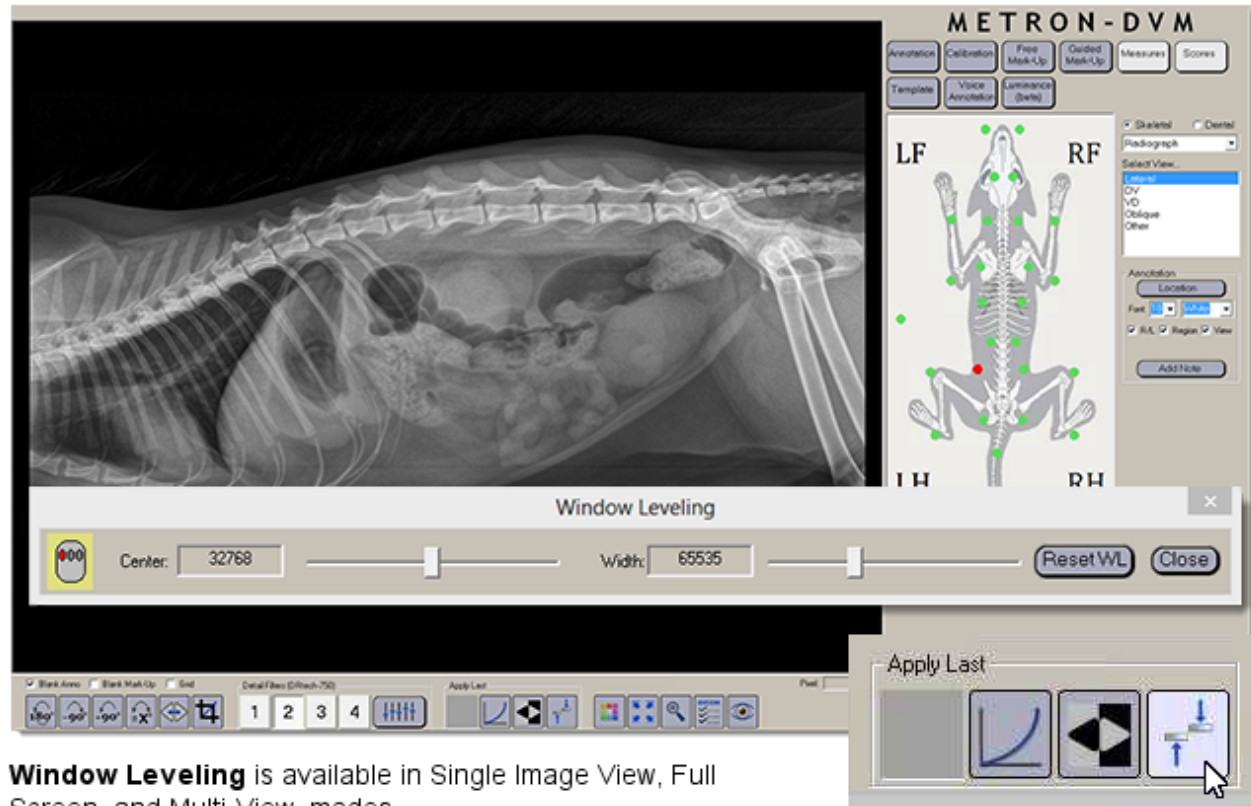
WinLev711-f.swf

To preview this movie you must publish to SWF.

In this example we are demonstrating the use of both the active **Window Leveling mouse movement** and **Window Leveling slider bar movement**. Just hold down the left mouse button and move to change the image.

Advanced Image Processing in Metron

Window Leveling



Window Leveling is available in Single Image View, Full Screen, and Multi-View modes.

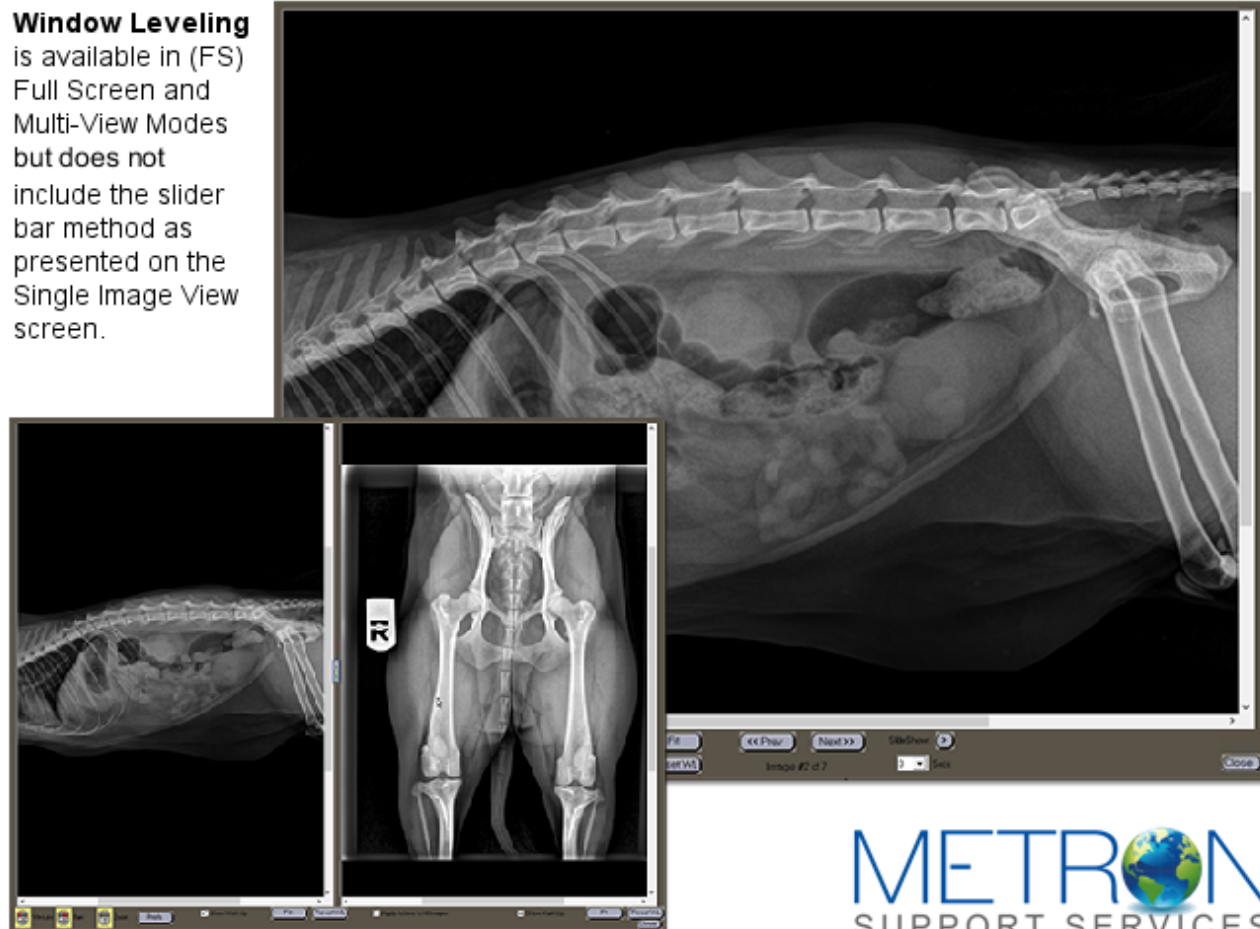
METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

Window Leveling

Window Leveling

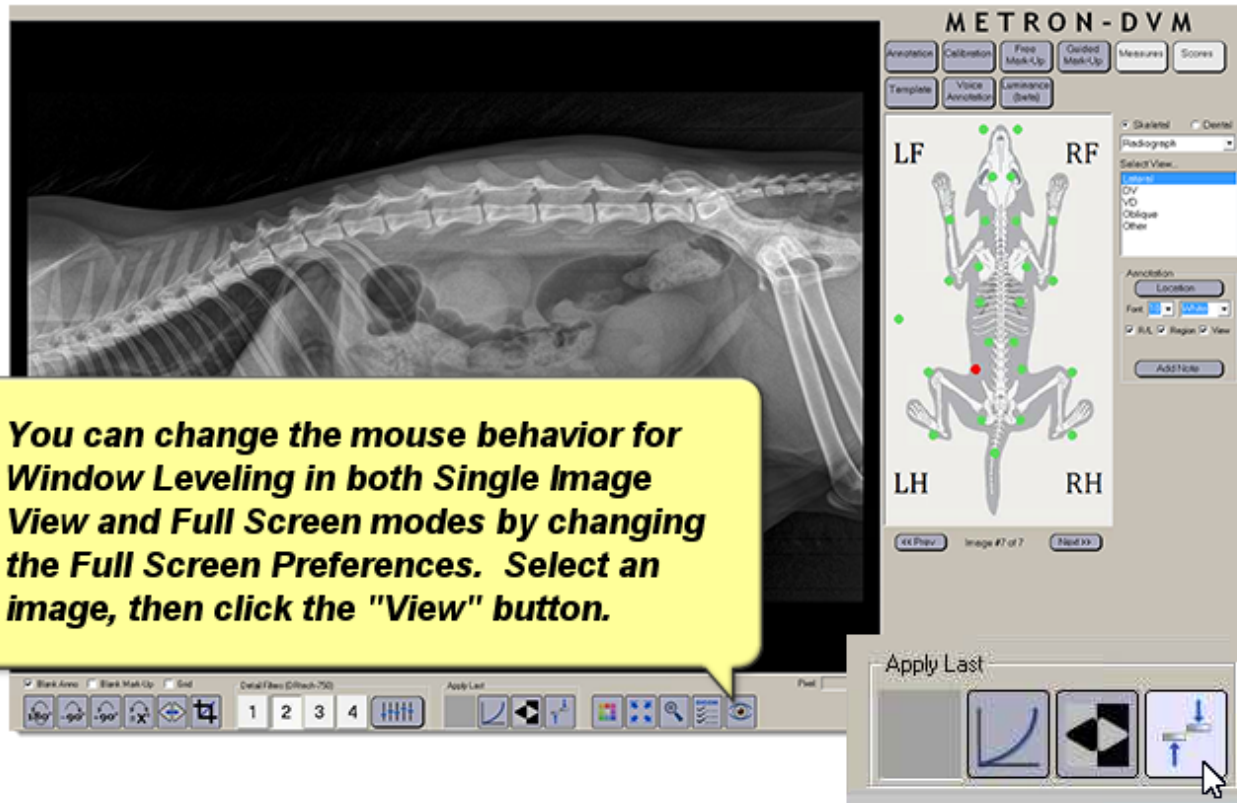
is available in (FS) Full Screen and Multi-View Modes but does not include the slider bar method as presented on the Single Image View screen.



METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

Window Leveling



37

Advanced Image Processing in Metron

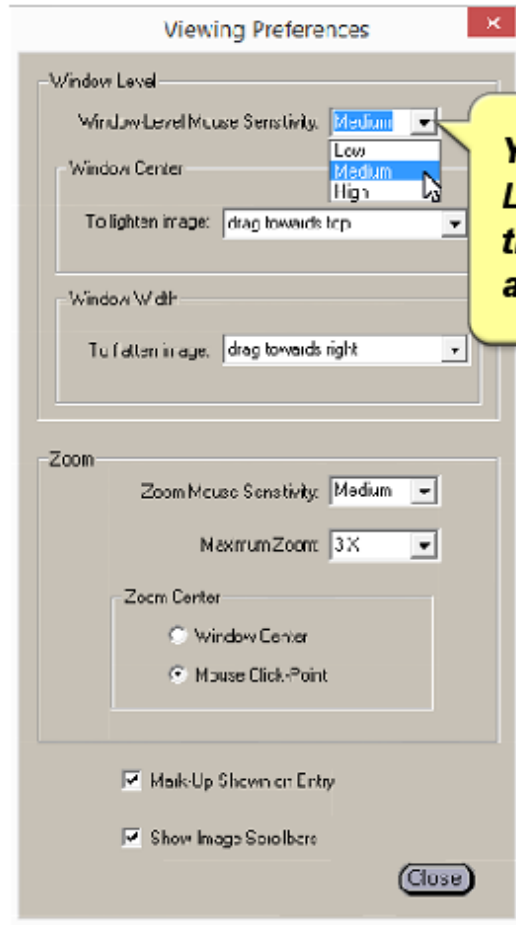
Window Leveling



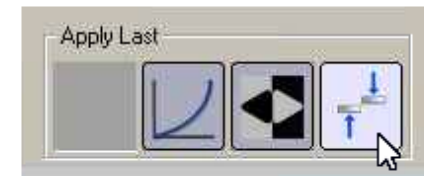
METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

Window Leveling



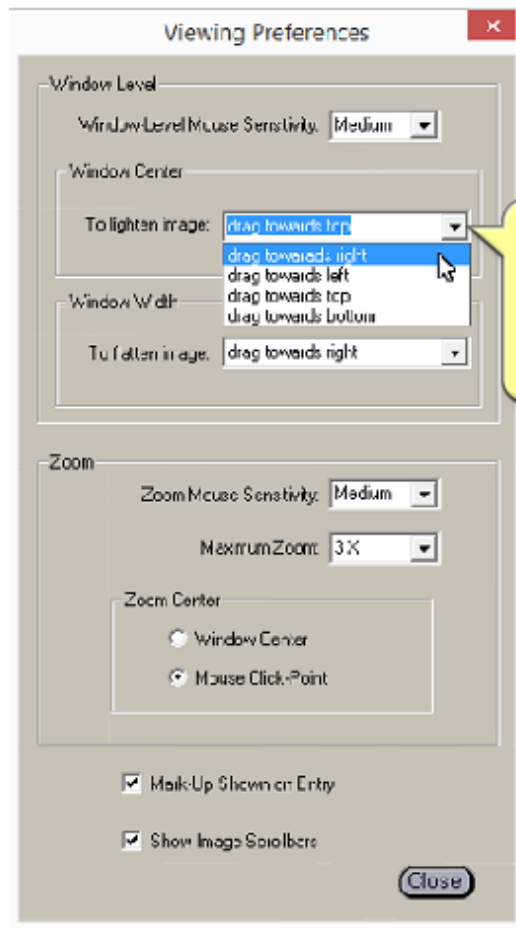
You can change the Window Leveling defaults by using the pull down arrows to view and select choices.



METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

Window Leveling

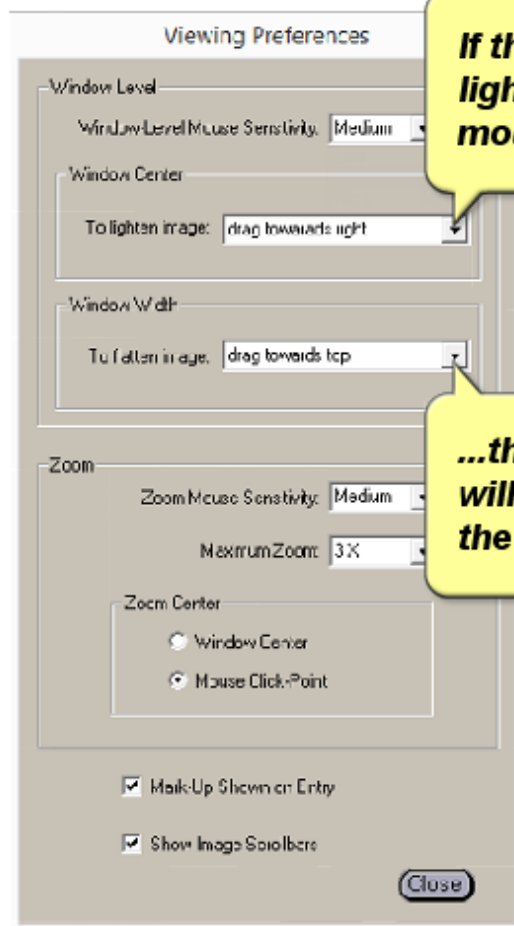


Once you have selected a new option, it will become a default setting.



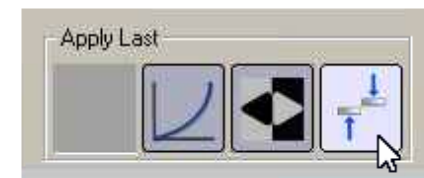
Advanced Image Processing in Metron

Window Leveling



If the user prefers the Window Center (to lighten the image) to function dragging the mouse to the right...

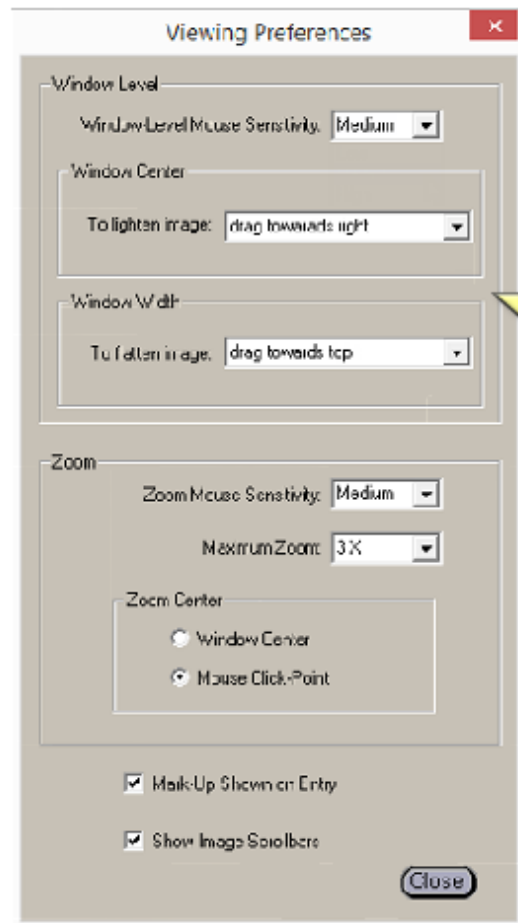
...the Window Width (to flatten image) will automatically change to dragging the mouse toward the top.



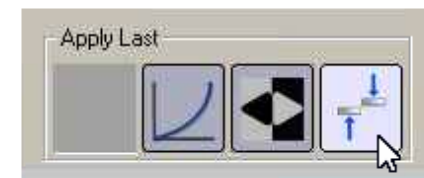
METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

Window Leveling



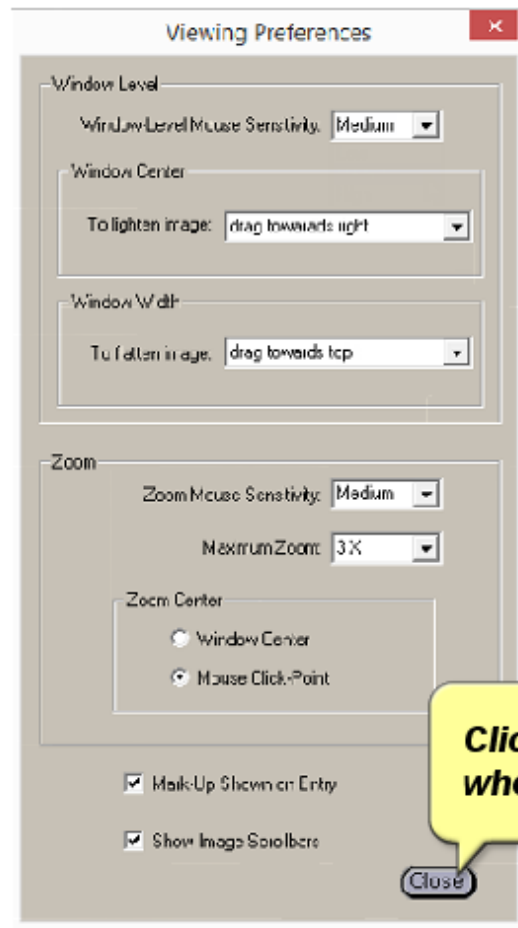
Changes you make to the default settings are based on your personal preferences only.... perhaps influenced by similar features in other imaging software programs.



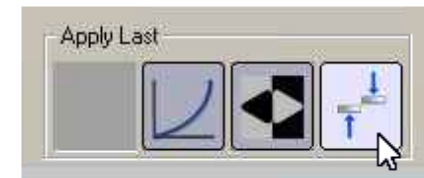
METRON
SUPPORT SERVICES

Advanced Image Processing in Metron

Window Leveling



**Click "Close"
when completed.**



METRON
SUPPORT SERVICES



Advanced Image Processing in Metron

This completes the "Advanced Image Processing in Metron" online training.
Please feel free to view it again or select another online training session to review.



Click F11 on your keyboard to minimize the browser screen
and click the window closed to exit this training session.

