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Imaris Vantage

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Getting Started with Imaris Vantage

What is Vantage?

- Provides a interactive way to "see" abstract numerical values (statistics)
- Create summarizing multi-dimensional plots
- Customize graph to highlight object relationships
- Compare multiple results by creating combined plots for the various datasets
- Advanced Data Exploration
- Plots linked to the corresponding objects in Surpass view







Vantage 1D View





Vantage1D is a tool to visualize univariate statistics for one or more groups. It displays boxplots and scatterplots and facilitates easy comparison of distributions from different groups by displaying the plots next to each other.



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The Filter tab of Vantage1D lets interactively select subsets of samples to be displayed in order to explore the univariate statistics of those subsets.



Vantage Objects View





The **Objects View** enables to compare and contrast experimental groups by visualizing the image data (segmented and original) in five dimensions as uni- or multi-variate scatterplots.





Vantage User Interface







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Box plots



Box plot summarizes the data of the selected statistical variable to only five numbers. It is a convenient way to illustrate graphically large group of statistical data through their summaries: the minimum, lower quartile (Q1), median, upper quartile (Q3), and maximum.



The central box represents the values from the lower Q1 to upper quartiles Q3 quartile (25 to 75 percentile respectively).

The line within the box is indicates the median value. A straight lines extending from the ends of the box represent the maximum and minimum values.

Box Plot is a useful tool offering several benefits to help you improve understanding of the data:

- 1. A quick visual summary that easily handles extremely large amount of data and shows range, spread and median value of the selected variable values.
- 2. The distance of the whiskers provides the distribution of the values
- 3. The space between the different parts of the box indicates the degree of distribution and skewness in the data
- 4. The position of the median inside the box indicates whether there are more values towards the upper or lower quartile



Creating custom graphs in Vantage

STEP 1: select data

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- 1. Select the object type for the plot creation (Spot, Surface, Cell or Filament)
- 2. Choose the object(s) to be displayed in the plot

Changes are immediately visualized



Vantage Graph

STEP 2: select plot option

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- 20 different plot options
- 2 5 'dimensions'
- Visualization instantly updated
- Gallery Plot deactivated if
 multiple objects are selected
- Statistical values grouped in categories
- Category Icon selected / deselected -> corresponding statistics shown / hidden
- statistical variables can be selected from a drop-down list



XYZ or ,Real world' plots: XYZ 3D Scale and Color



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Scale: Ellipticity (oblate)

-> small objects have a smaller value for Ellipticity (oblate) than larger objects

Color: *sphericity.*

-> blue objects are less spherical than red objects





Gallery Plots

- Panel of rows and columns where each pane displays an object
- Number of rows and columns can be adjusted If there are not enough panes some objects are automatically skipped
- Objects are placed according to the sorted statistical values
- up to 2 different statistical variables can be defined to be used to sort or to color the objects
- exclamation mark indicates that the statistical parameter is identical for all objects
- Ascending Sorting: (lowest value bottom left)
- Descending Sorting: (highest value bottom left)









Scatter Plots



- Scatter plot can show five statistical variables, X,Y, Z, Color, Scale.
- Within the Scatter Plot, an object's position depends on the values assigned to the X, Y and Z dimensions.
- To add another dimension to the plot, a fourth or fifth variable can be correlated to the color or size of the plotted object, or a combination of these features







Time / Track Plots

- "Time" Plot option (top right):
 - X axis: always set to Time
 - Y/Z/Color/Scale Axes: values that change over time
- "Scatter" Plot option (bottom right):
 - All Axes are freely selectable
 - Option to plot single value per track
- "Gallery" option (bottom left)
 - Aligned rendering of tracks / objects
 - Sort and/or color according to stats





TPLA



Multiple objects types combined in one view

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- Select the first object type for the plot creation (e.g. Spots)
- 2. Choose a Plot type
- 3. Finish the wizard for that object type
- 4. Add a new Vantage Plot
- 5. Choose the next type of objects
- 6. Choose a compatible plot type
- 7. Finish the Wizard for the second object



FP.

Vantage 2 - Properties

2





Vantage Editing options: Add different Dimensions



- Add up to 3 different dimension/statistical variables to 3 major axis
- X1, X2, X3, Y1, Y2, Y3, Z1, Z2, Z3, Scale and Color
- Assigned statistical variables to the plot dimension
 - For each dimension one statistical variable can be chosen from the drop-down list
 - The list offers a set of all enabled statistical values
- Selecting or de-selecting the box next to the plot dimension controls its visibility in the viewing area





Vantage Editing options: Add different Dimensions

- Scale
 - scales each plot dimension to account for different magnitudes of the chosen statistical variables
 - automatically calculated to let the ranges appear to be the same for all of the objects currently being visualized
 - Can be adapted by entering a new scale value that is multiplied with the initially calculated values
- Offset
 - used to reposition the objects within the plots
 - new value is calculated by adding the entered offset to the selected statistical value
- Min, Max
 - range automatically adjusted to lowest and highest value
 - Smallest and largest value to be displayed

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Imaris Vantage – Standard Tabs

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