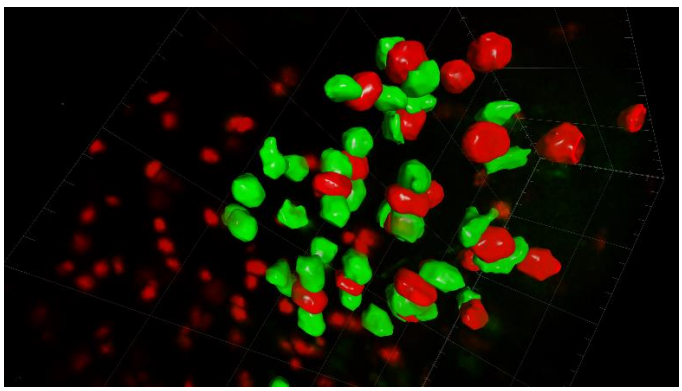
Visualization and Analysis of Large Image Data via Desktop, Web and Virtual Reality

Tamara Manuelian

arivis AG, Division Imaging Science

During the past few years, novel developments in microscopy and new methods in sample preparation and staining allow high-resolution imaging of whole organisms and organs. In addition specimens may be imaged in long-term time lapse experiments with high resolution in several channels in 3D.
The data produced by these new techniques are often extremely large, and range from several hundred gigabytes to terabytes. How can such file sizes be handled for proper visualization and image analysis? Is there a robust and highly-performant scalable desktop or web-based solution for a broad variety of image analysis tasks for a large of 2D, 3D or 4D image data?
We will present strategies in arivis software how to tackle these challenges. We will show how to handle even TB-sized data sets with full interactivity in any step of image processing and how to integrate scalable analysis functions into the imaging data pipelines.
Visualization and Analysis of Large Image Data:
arivis award winning software Vision4D allows to handle image data with virtually unlimited file sizes (files of up to 6 TB have been used in the lab to prove unprecedented performance) on standard desktop PCs or notebooks, hence allowing for a hardware-independent exploration of a wide range of scientific imaging tasks.
Even for huge data arivis Vision4D ensures robust handling, visualization and exploration keeping high performance in the complete image processing workflow. This ranges from original file import, to the creation of 3D and 4D rendered volumes, visibility corrections & modification, export of screenshots & movies and quantification by measurements & image analysis.
Among various user applications, the benefit is substantial for customers applying modern tissue clearing methods, as well as light sheet microscopy, or any imaging techniques creating large 3D/4D data sets.



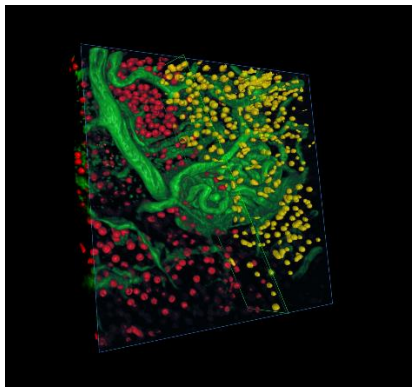


Image Courtesy: ***left:*** *Meiotic spindles, Image Courtesy of Gunar Fabig, Müller-Reichert lab, Experimental Center, Medical Faculty Carl Gustav Carus, Technische Universität Dresden (TUD), Germany* ***right:*** *mouse glomerulus*