Imaging Considerations to Enhance Data Post-Processing

Image post-processing involves filtering, segmenting, and quantifying data acquired via an imaging modality, and is the last step in the workflow when analyzing samples with an imaging system. We would like to highlight how acquisition practices affect post-processing workflows. For example, segmentation is the time-consuming process of categorizing groups of voxels representing real objects within an image based on grayscale or morphology. This process depends heavily on appropriately saturated images, where the contrast between these objects is sufficient to confidently construct the boundaries that define them in real space. Saturation, which is the spread of a histogram within bin boundaries determined by an image’s bit depth, can only be truly determined at the time of acquisition. Thus, we should strive to achieve optimal saturation during the acquisition step, rather than relying on post-processing to fix poor saturation. Increasing image bit depth can also increase contrast, but increasing bit depth also increases file size. This can cause unnecessary bloat on users’ hard drives and increase RAM consumption and processing times during workflow construction. In some cases, neglecting these parameters can be detrimental to our ability to perform timely and accurate analyses. This presentation addresses this example, in addition to others, to inform the audience of considerations they can take into account at the first step of their entire workflow to improve the post-processing experience. While most of these considerations are relevant to all imaging modalities, there is a special focus on FIBSEM systems.