We have developed a remote, thin-client based, high-end volume viewing and analysis software system, Remote Interactive Volume Visualization Infrastructure for Researchers (RIVVIR), deployed at the Small Animal Imaging Shared Resource (SAISR) at the Comprehensive Cancer Center at The Ohio State University’s Medical Center. RIVVIR exploits graphical processing unit (GPU) technologies to provide visualization of and remote interaction with multidimensional data obtained from the SAISR’s microimaging facilities including µCT, µMRI, nuclear (µPET, µSPECT), ultrasound, and optical.

Researchers using the SAISR frequently need to quantify and characterize the extent of cancer being manipulated in various animal models. However, these researchers usually do not possess expertise in computing and are relatively naïve in image processing and analysis. RIVVIR enables these researchers to visualize and remotely interact with multidimensional data obtained from the SAISR. These visualizations are provided as remote interactive sessions via thin-clients in their offices and laboratories. This approach enables researchers to visualize and manipulate their multidimensional imaging data using generic desktop computers without specialized 3D graphics hardware, while simultaneously providing near-ubiquitous access to volume visualization capabilities.

Our preliminary tests showed that up to 8 users with relatively small datasets (256³) can run off one graphic card at roughly 10-15 fps. We intend to expand our current system into a more intuitive, collaborative, reliable, and generalizable end-to-end solution, appropriate for domain experts, who are not familiar with visualization tools. We will also further optimize RIVVIR’s performance by improving “network awareness,” which enables reliable RIVVIR utilization across a greater number of user network environments. We also intend to expand RIVVIR’s visualization and analytics services to additional groups using animal models in their research.