Finding Cancer in Medical Images with Advanced 3D Viewing Software

Outcome: Researchers from CELEST, an NSF-funded Science of Learning Center, have found that displaying a thick section of a 3D lung x-ray can improve observers’ ability to detect cancerous formations. Using a 3D monitor setup and custom software that draws medical images for viewing in 3D, they showed that more lung abnormalities were detected when observers viewed the lung as a thick slab than when observers viewed the lung as thin slices. Along with this benefit, observers also generated more false positives, indicating a need for improved training for distinguishing between abnormalities and normal lung.

Impact/benefits: The custom software and new viewing methods may help radiologists detect lung cancer at an early stage, improving the chances for successful treatment. The software also has potential application in other radiology tasks beyond viewing the lungs, such as examining intricate arrangement of blood vessels or planning precise invasive surgery.

Explanation/background: CELEST researchers have developed highly flexible software that can take any 3D volume of data (lung images in our case) and render arbitrary slabs, cubes, or spheres of data as though they were being viewed from two, separated eyes. This provides a potentially much richer viewing environment than simply scrolling through a stack of two-dimensional images as is the current standard practice in radiology.