Subject: Re: Medical Imaging Question
Posted by David Fenyes on Fri, 13 Aug 1999 07:00:00 GMT
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Hello David,

1) Of course you can physically do this. One way is to find or build a special CRT (or any other technology) that can display that kind of greyscale. Of course you can dither the image in magnification, then opticaly (or neuronally) blur. Alternatively, change each pixel into an exposure time (meaning the pixel is on for e.g. 0-4.095 seconds), then expose a film in a dark room (or find a souped up laser filmer). Develop and place against a lightbox in a dark room to appreciate. Or write software to time average on the retina (like the HP48 calculator greyscale programs do).

2) Of course, you probably don't really want to do this. Radiologists, especially mammographers and chest radiologists, are famous for wanting all the dynamic range. However, they like to sit in total darkness, and often use blinders. Even so, they often use the hotlight, or have the tech expose to get the object of interest in their visual sweet spot. In otherwords, having all the dynamic range there on the film doesn't free you from physically windowing and leveling to see your object of interest.

For digital images such as CT, images are routinely printed with several window/level settings to look at bone, solid organs, excreting kidneys, brain, etc. On the scanner, they are constantly playing with the settings. This is no handicap. Like the lightboxes and the exposure settings for plain film, it's a natural way of making sure the important pathology patterns register on the neural networks in the retina and occipital lobe.

3) Naturally, you still want to keep the numerical image as accurate as possible while window/level mapping it onto the more practical 256 levels. That way, if you perform any computations on the image, you have all the precision. Computers don't suffer from the perception limitations that humans do :-)

Regards,

David

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