

AbstractID: 2291 Title: Predicting detection task performance using a visual discrimination model: beyond Gaussian nodules

In the visual discrimination model (VDM) approach two near-identical images are analyzed. The VDM program calculates the just-noticeable-index (JND) index, which is a measure of the perceptual difference between the two images in the *discrimination* task. It has been proposed that if one can simulate relevant lesions and backgrounds, the same method can be used to predict target *detectability* on mammographic backgrounds. One generates pairs of images which are exactly identical except for the presence of a lesion in one of them. The JND-index measured on this image pair is interpreted as the target detectability. Several studies supporting this idea have appeared in the literature. In this work we note that this can lead to non-optimal results. A basic problem is that the method appears to work on single images, whereas the ROC method needs sets of normal and abnormal images to yield a detectability measure. We show that by modifying the method so that comparisons of near-identical images are avoided, it is possible to better correlate with the ROC method.