

AbstractID: 7665 Title: Operating characteristics predicted by models of location specific diagnostic tasks

Operating characteristics summarize observer performance in diagnostic tasks. Examples are the ROC, the LROC, the FROC, and the AFROC. Models of observer performance differ in their abilities to predict operating characteristics. For example, ROC models can predict the ROC curve, but cannot predict LROC, FROC or AFROC curves. Location specific models are, in historical order, the FROCFIT model, Swensson's LROC model and the search model (SM). In principle any of these models can predict all of the characteristic curves noted above. The purpose of this work was to compare the ability of these models to predict operating characteristics. CAD data consisting of mark-rating pairs on 450 images were used to determine the various operating characteristics. For example, the highest rating on each image determined the ROC curve; the lesions rated higher than the highest noise determined the ordinate of the LROC, etc. All models agreed with the observed ROC data. Swensson's model agreed with the observed LROC curves but departed mildly from the observed AFROC curve and strongly from the observed FROC curve. The FROCFIT model departed mildly from the AFROC curve and strongly from the FROC curve. The search model provided good fits to all operating characteristics. In conclusion this work provides additional validation of the search model method of analyzing free-response data.